

A Preliminary Inventory of the Dragonflies and Damselflies of Robinson State Park, Agawam, Massachusetts

for the Massachusetts Natural Heritage and Endangered Species Program

Submitted by
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Field Searches and Data Collection

During the 2007 field season we visited Robinson State Park on 10 separate occasions (2 visits in May, 4 in June, 3 in July, 1 in August) for a total of 80 hours of field time. To inventory the odonates, we inspected emergent vegetation and riparian areas for exuviae, used a wire-screen dredge-net to sample for nymphs in the Westfield River, tributary streams and other water bodies, and searched for adult odonates in the park's freshwater wetlands, water ways and upland areas (especially its right-of-ways). A total of 47 odonate species were found, 8 of which are state-listed (see NHESP rare animal field forms).

Searching for skins

The most effective method for surveying for rare odonates during this study involved searching the banks of the Westfield River for shed skins. This was particularly productive during the first two site visits in late May when close to 300 exuviae were recovered from a 100 meter stretch of riverbank not far from the Robinson Pond recreation area. The shed skins represented 8 species of dragonfly, four of which were state-listed (**Table 1**). The surveyed section of bank is located on the southwest side of the river, directly below a partial rock jetty that extends nearly the full width of the river (**Figure 1**). The boulders of the jetty act like a leaky dam, creating a short

Table 1. Shed skins found on May 30-31, 2007 along a 100 meter section of the Westfield River in Robinson State Park.

Name	#'s
Spine-crowned Clubtail, <i>Gomphus abbreviatus</i> (E)	105
Rapids Clubtail, <i>Gomphus quadricolor</i> (T)	48
Mustached Clubtail, <i>Gomphus adelphus</i>	13
Dusky Clubtail, <i>Gomphus spicatus</i>	3
Riffle Snaketail, <i>Ophiogomphus carolus</i> (T)	5
Maine Snaketail, <i>Ophiogomphus mainensis</i>	2
Rusty Snaketail, <i>Ophiogomphus rupinsulensis</i>	122
Stygian Shadowdragon, <i>Neurocordulia yamaskanensis</i> (SC)	1

stretch of shallow rapids that flow over a substrate of cobbles, gravel and sand. The shoreline below the rock jetty had far more skins per linear meter than any other surveyed section. The river, both upstream and downstream from this area, is generally deeper and slower, and the bottom is covered with silt and/or sand.



Figure 1. Areas of riverbank surveyed for dragonfly skins at Robinson State Park.

Odonate skin collecting along selected stretches of the Westfield River continued for the next two months, with the site below the rock jetty producing several new species, including four state-listed dragonfly taxa: Arrow Clubtail, *Stylurus spiniceps* (T), Zebra Clubtail, *Stylurus scudderi* (E), Ocellated Darner, *Boyeria grafiana* (SC) and Stygian Shadowdragon, *Neurocordulia yamaskanensis* (SC) (**Table 2**).

Table 2. Shed skins found along the shoreline of the Westfield River in Robinson State Park, Agawam, MA during June and July, 2007

Name

- Illinois River Cruiser, *Macromia illinoiensis*
- Twin-spotted Spiketail, *Cordulegaster maculata*
- Arrow Clubtail, *Stylurus spiniceps* (T)
- Zebra Clubtail, *Stylurus scudderi* (E)
- Least Clubtail, *Stylogomphus albistylus*
- Rusty Snaketail, *Ophiogomphus rupinsulensis*
- Black-shouldered Spinyleg, *Dromogomphus spinosus*
- Fawn Darner, *Boyeria vinosa*
- Ocellated Darner, *Boyeria grafiana* (SC)
- Stygian Shadowdragon, *Neurocordulia yamaskanensis* (SC)

Dredge-netting for nymphs

During two of the ten visits to Robinson State Park we used long-handled, wire-mesh dredge nets to sample for odonate nymphs at several locations in the Westfield River. Seven species were found, including two state-listed taxa. The highest dragonfly nymph diversity was found below the previously mentioned rock jetty (**Table 3**).

Dredge net sampling was also conducted in several of the park's small streams. These perennial, sandy-bottomed streams were much less diverse than the Westfield River, with only two genera present. Early in-star Spiketails, *Cordulegaster* spp. were observed in all the streams. Nymphs of Southern Pygmy Clubtails, *Lanthus vernalis*, were found in one of the shaded, spring-fed streams that flows through a large red-maple swamp on the eastern side of the park.

Table 3. Nymphs found in the Westfield River within Robinson State Park on June 6 and June 9, 2007.

Name

Illinois River Cruiser, *Macromia illinoensis*
Twin-spotted Spiketail, *Cordulegaster maculata*
Black-shouldered Spinyleg, *Dromogompus spinosus*
Dragonhunter, *Hagenius brevistylus*
Arrow Clubtail, *Stylurus spiniceps* (T)
Zebra Clubtail, *Stylurus scudderi* (E)
Fawn Darner, *Boyeria vinosa*

Searching for adult dragonflies and damselflies

Several of our site visits were spent observing and netting adult odonates in selected habitats within the park. We searched powerline right-of-ways, along the main stem of the Westfield River and at various wetland/pond locations. **Table 4** provides a list of all the adult dragonfly and damselfly species we observed in the park during our 10 visits. Although many species were common, we netted two adult Skillet Clubtails, *Gomphus ventricosus* (SC), perched on vegetation in a powerline ROW close to the Westfield River (See the pertinent Rare Animal Observation Form for site information).

Summary

The total number of dragonfly and damselfly species at Robinson State Park (skins, nymphs and adults) observed during the 2007 survey was 47. Of these, 8 were state-listed species. Some of the rare species were only observed as shed skins and/or nymphs and one species was found only in the adult stage. All of these listed species were associated with the main stem of the Westfield River.

Recommendations for Future Studies

From the results of this survey and others that we have done, it appears that shed skin collecting is a very effective technique for gathering both quantitative and qualitative data on odonate populations within a discreet area. Doing this type of survey at the same location over several years is also a sound way to monitor population change, and an especially useful approach for monitoring elusive riverine gomphids, many of which leave their natal rivers after emerging

for weeks at a time, foraging in the upland forest canopy and surrounding fields before returning to mate and lay eggs. What's more, even when they return, some of these species perch high in the trees, fly far out over rivers, and are exceptionally wary and hard to net.

To get good exuvia data, it is crucial that skin collecting take place during emergence periods or very soon afterward because a single strong storm event can easily wash the skins away.

Future surveys for rare odonates at Robinson State Park should begin early enough in the field season (mid-May). This will allow investigators to either collect nymphs using dredge nets, or collect skins from the very early emergers while they're still eclosing on the riverbank. Live nymphs could be brought back to the lab to emerge in captivity and the shed skins and individual adults would provide accurate identifications.

A challenge that some volunteer(s) might want to take on at Robinson State Park would be to visit the river's edge at dusk to try to discover if UMBER Shadowdragon, *Neurocordulia obsoleta* (SC) is present. This species has been found downstream in Connecticut but, to date, it has not been observed in western Massachusetts.

Park staff or volunteers should also be encouraged to use a canoe or kayak to search the entire 4 mile length of the Westfield River shoreline within the park. This would be especially valuable in late May/early June, when skins of Skillet Clubtail, *Gomphus ventricosus* (SC) or perhaps some other note-worthy odonate species may be found.

Table 4. Adult Dragonflies and Damselflies Observed at Robinson State Park from May 30 to August 1, 2007

Calopterygidae: Broad-winged Damsels
Ebony Jewelwing, *Calopteryx maculata*

Lestidae: Spreadwings
Common Spreadwing, *Lestes disjunctus*
Spotted Spreadwing, *Lestes congener*
Swamp Spreadwing, *Lestes vigilax*
Slender Spreadwing, *Lestes rectangularis*

Coenagrionidae: Pond Damsels
Familiar Bluet, *Enallagma civile*
Northern Bluet, *Enallagma cyathigerum*
Marsh Bluet, *Enallagma ebrium*
Stream Bluet, *Enallagma exsulans*
Eastern Forktail, *Ischnura verticalis*
Fragile Forktail, *Ischnura posita*
Sedge Sprite, *Nehalennia irene*
Powdered Dancer, *Argia moesta*

Aeshnidae: Darners
Springtime Darner, *Basiaeschna janata*
Common Green Darner, *Anax junius*
Fawn Darner, *Boyeria vinosa*

Gomphidae: Clubtails
Lancet Clubtail, *Gomphus exilis*
Spine-crowned Clubtail, *Gomphus abbreviatus* (E)
Black-shouldered Spinyleg, *Dromogomphus spinosus*
Skillet Clubtail, *Gomphus ventricosus* (SC)
Rusty Snaketail, *Ophiogomphus rupinsulensis*

Cordulegastridae: Spiketails
Delta-spotted Spiketail, *Cordulegaster diastatops*
Twin-spotted Spiketail, *Cordulegaster maculata*

Macromiidae: Cruisers
Stream Cruiser, *Didymops transversa*
Illinois River Cruiser, *Macromia illinoensis*

Corduliidae: Emeralds
Common Baskettail, *Epiheca cyanosura*
Prince Baskettail, *Epiheca princeps*

Libellulidae: Skimmers
Blue Dasher, *Pachydiplax longipennis*
Eastern Pondhawk, *Erythemis simplicicollis*
Slaty Skimmer, *Libellula incesta*
White Corporal, *Libellula exusta*
Common Whitetail, *Libellula lydia*
Twelve-spotted Skimmer, *Libellula pulchella*
Band-winged Meadowhawk, *Sympetrum semicinctum*
Dot-tailed Whiteface, *Leucorrhinia intacta*
Frosted Whiteface, *Leucorrhinia frigida*

Other Insects of Note at Robinson State Park

Oil Bee

A rare oil bee, *Macropis ciliata*, was netted on June 20, 2007 as it gathered oil from the flowers of whorled loosestrife, *Lysimachia quadrifolia*. It was found on one of the park's powerlines at the following coordinates; N 42°05.16' W 72° 40.06'.

Eastern Cicada Killer Wasps

A large population of Eastern Cicada Killer Wasps, (*Sphecius speciosus*) was observed in late July in a section of mowed lawn adjacent to the Robinson Pond swimming area. Park staff had roped off the 100 square meter area with yellow tape and the lifeguard warned visitors to stay away from the site. Although female Cicada Killer Wasps rarely sting unless disturbed, people sometimes become alarmed because of their very large size (nearly two inches). Males have especially aggressive territorial behavior and may actually defend their territory by dive bombing people's heads and shoulders, but they have no sting. The female wasps are not aggressive. These solitary wasps probably use the same well-drained sandy nesting site every year. It would be a good idea for the park staff to install a small informational sign near the site to educate the public about these spectacular insects.

A Population of Uncommon/Rare Caddisflies?

A large number of caddisfly nymphs and their small curved sand cases were found in the muck of spring seeps that are the source waters for the small streams at the east side of the park. Although we retrieved a few of them, we did not preserve them properly and therefore are not completely sure of their identity. We suspect they may be *Beraea sp.* in the family, Beraeidae. Although not state-listed, this taxa (3 species) are described in the third addition of An Introduction to the Aquatic Insects of North America, edited by R. W. Merritt and K.W. Cummins, as exceedingly local. It would be worthwhile to return to the seeps, retrieve more specimens, and accurately identify them.

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EDUCATION

B.S. in Geology, University of Massachusetts, 1965
M. Ed., University of Massachusetts, 1978

EXPERIENCE

Consulting Biologist for private clients and MA Div. of Fisheries and Wildlife (NHESP and MassWildlife), Westborough, MA (1994-1997; 1999-present)

Conduct natural history inventories of selected areas on taxa of interest, with special emphasis on those listed under MESA or on NHESP's "Watch List". Area of expertise includes vascular plants, odonates, butterflies, freshwater mussels, reptiles and amphibians. Complete evaluations to ensure no environmental impact on rare species habitat in accordance with MA Wetlands Protection Act.

Writer/Editor, *A Natural Focus*, WGBY/Channel 57 (1994-1999) and *Field Notes*, WFCR 88.5 FM (1999-present)

Provided scientific expertise, research and editing for a series of 4-6 minute natural history television shows that air on WGBY/Channel 57 and WGBX/Channel 44 and a weekly, natural history radio series on WFCR 88.5 FM. To date, 35 television segments and more than 100 radio segments have been produced. In 1998, the television series was selected for national distribution. Additional scientific consulting for Larry Pringle, author of An Extraordinary Life: The Story of a Monarch Butterfly.

Naturalist/Guide, A Natural Focus LLC, Westhampton, MA. 1995-present.

Coordinated and guided natural history tours to Costa Rica, Belize, Mexico and the Galapagos for tourists and educators.

Educator, Smith College Science & Engineering Program, Northampton, MA. (2000-present)

Instruct a 2-week intensive course on biodiversity and rare species to high school girls participating in a month long, residential science program.

Science Teacher, Northampton Public Schools, Northampton, MA (1966-68; 1981-89; 1993-2001)

Teach life, earth and physical science to middle school-age children. Coordinate community service learning projects with students at local conservation areas that involve volunteer work and natural history education.

Science Specialist, Northampton Public Schools, Northampton, MA (1968-81; 1989-93)

Coordinated the K-8 science curriculum and provided in-service training for teachers (Grades K-8). Developed and taught innovative, hands-on, project-based learning activities at the elementary schools and middle school.

Adjunct Faculty, Mount Holyoke College, South Hadley, MA (1983-96)

Developed and taught an intensive science methods course for pre-practicum education majors.

Property Manager, Arcadia Wildlife Sanctuary, Massachusetts Audubon Society, Easthampton, MA (1981-94)

Maintained trails (including boardwalk construction) and enforced sanctuary rules (hunting, access). Coordinated weekly volunteer parties on a variety of management projects, including non-native species removal (glossy buckthorn, purple loosestrife). Provided natural history information to visitors and presented slide/lectures on various natural history topics to MA Audubon audiences and other groups.

GRANTS/CONTRACTS/ARTICLES

- 2001-2006 Survey of rare odonates at pre- and post-bank-stabilization sites on the Connecticut River, Northeast Utilities, MA Environmental Trust and MA NHESP.
- 2000-2002 MassWildlife Butterfly Inventories at six wildlife management areas
- 1999 MA NHESP, Biological Inventory (amphibians, reptiles, freshwater mussels, odonates and cicindelids) and Project Coordination of Barre Falls ACOE
- 1999 MA NHESP, Biological Inventory (amphibians, reptiles, freshwater mussels, odonates and cicindelids) and Project Coordination of Littleville ACOE
- 1997 MA NHESP, Biological Inventory (amphibians, reptiles, freshwater mussels, odonates and cicindelids) of Knightville ACOE
- 1996 MA NHESP, A Preliminary Survey of the Odonata of the Connecticut River Valley
- 1996 MA NHESP, Biological Inventory (odonates and freshwater mussels) of Conant Brook and East Brimfield ACOE
- 1994 MA NHESP: A Survey of the Elderberry Borer Beetle in the Connecticut River Valley
- Morrison, Fred. 1987. The Marvelous Monarch. Facts on File: Scientific Yearbook. NY: Facts-on-File Publications. 23-29.

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EDUCATION

Smith College, Northampton, MA
A.B. May 1988, cum laude Major: Biology

Field Naturalist Program, Department of Botany
University of Vermont, Burlington, VT Master of Science, May 1993

EXPERIENCE

Host/Producer, *Field Notes*, 88.5 FM WFCR, Amherst, MA (1999-present)

Write, host and produce a weekly radio feature, *Field Notes*, that highlights the region's natural history. One of WFCR's top 10 URLs. Recipient: New England Wildflower Society's Environmental Ed. Award 2001.

Instructor, Smith College Summer Science & Engineering Program (2000-present)

Teach a 2-week intensive course on biodiversity, special habitats and rare species to high school girls from the United States and other countries around the world.

Tour Leader, Natural History Guide & Course Instructor, Costa Rica. (1990's; 2005-present)

Serve as natural history guide and organizer for natural history tours in Costa Rica and other Latin American countries; course instructor for tropical biology course for graduate students (University of Vermont 1993, 94) and naturalist in the Monteverde Cloud Forest Reserve (92-94).

Rare Species Studies, MA Natural Heritage Program, Westboro, MA (Field Seasons 1988-present)

Locate new stations of state-listed plants and animals in central and western MA (plants, freshwater mussels, odonates, tiger beetles). Discovered a naturally-occurring, previously unrecorded hybrid between green dragon (MA Threatened) x jack-in-the-pulpit ('88). Current work focuses on population dynamics of rare dragonflies in the CT River.

UMass Extension Specialist, Natural Resource & Environmental Conservation, Amherst, MA (1998-2005)

Coordinated research, outreach and public policy components for a 30,000-acre watershed project. Conducted ecological inventories and open space plans for land trusts, municipalities, and private clients. Developed and presented workshops on natural resources wetlands regulations and permitting in Massachusetts.

Host, Writer & Producer, "A Natural Focus", with WGBY/Channel 57, Springfield, MA (1994-98)

Wrote and hosted a series of 5-7 minute videos on New England's natural history. 36 short segments and an award-winning 30-minute production on urban natural history were produced. Programs air on MA, NH and VT public television and were distributed nationally.

Wetlands Specialist & Service Center Director, Dept. of Environmental Protection, Springfield, MA (1995-98)

Provided technical and procedural information to conservation commissions on Massachusetts' wetlands laws. Developed educational materials & exhibits on issues regulated by DEP. Organized quarterly professional/cross-training seminars for staff. Wrote & hosted 30-minute videos-1 on delineating wetland boundaries, the other on septic system compliance. Recipient: DEP's Pride & Performance Award 1997.

Botanist/Ecologist, U.S. Forest Service & University of Vermont, Burlington, VT (1993-95)
Examined the effect of forest management practices and plant species diversity over time.

Consulting Ecologist, City of Northampton, MA (1993)
Prepared ecological assessments of conservation areas and high priority acquisition areas.

Environmental Planner, Town of Cheshire, CT (1988-89)
Acted as staff to the Environment Commission and Inland Wetlands & Watercourses Commission. Developed and produced a quarterly environmental newsletter and a year-long, family-oriented natural history walk/lecture series. Wrote a weekly natural history column (circ. 10,000).

RELATED GRANTS

2007: WMECO Grant (\$15,040) for *Field Notes*
2007: Anonymous Donor (\$1,000) for *Field Notes*
2006: Highland Communities Initiative (\$5,000) for *Field Notes*
2006: MA Urban and Community Forestry (\$5,000) for *Field Notes*
2006: Long Island Sound Futures Fund (\$5,000) for *Field Notes*
2005: Anonymous Donor (\$5,000) for *Field Notes*
2004: Massachusetts Environmental Trust (\$15,000) for *Field Notes*
2004: Massachusetts Environmental Trust (\$24,000) for dragonfly survey
2004: MA NHESP (\$2,800) for larval dragonfly study
2004: Anonymous Donor (\$3,000) for *Field Notes*
2004: William P. Wharton Trust (\$5,000) for *Field Notes*
2004: Highland Communities Initiative (\$4,800) for *Field Notes*
2004: Annie Tiberio Photography (\$2,500) for *Field Notes*
2003: Anonymous Donor (\$3,000) for *Field Notes*
2002: Northeast Utilities Foundation (\$42,000) for *Field Notes*
2002: Anonymous Donor (\$3,000) for *Field Notes*
2002: DEM Greenways and Trails Grant (\$5,000) for *Field Notes*
2002: US National Park Service (\$2,000) for radio documentary on the Northern Forest Canoe Trail
2001: Massachusetts Environmental Trust (\$12,000) for *Field Notes*
2000: US Fish & Wildlife Service Silvio O. Conte Wildlife Partnership Grant (\$5,000) for *Field Notes*
1999: DEP, Stormwater & Riverfront Workshops (\$39,000) (w/UMASS Extension)
1999: MA Riverways, Watershed Awareness (\$3,500) (w/UMass Extension)
1999: US Fish & Wildlife Service Silvio O. Conte Wildlife Partnership Grant (\$7,610) for *Field Notes*
1998: NATAS Emmy Nomination for On-Camera Talent
1998: Silvio O. Conte U.S. Fish & Wildlife Grant (\$10,000) for video productions with WGBY/Channel 57
1997: Cable Endowment Excellence in Programming Award for "The Urban Naturalist"
1997: U.S. Fish & Wildlife Service Silvio O. Conte Wildlife Grant (\$5,000) for video productions
1997: MA Natural Heritage Small Grants (\$4,500) for rare species inventories
1997: MA DEM Greenways Grants (\$6,000) for video productions with WGBY/Channel 57
1996: Southeast Educational Communications Association, Honorable Mention for educational videos
1996: MA Natural Heritage Small Grants Program (\$2,000) for dragonfly projects
1996: Silvio O. Conte U.S. Fish & Wildlife Grant (\$10,000) for natural history videos with WGBY /Channel 57
1995: Springfield Continental Cable (\$12,000) for 30-min. urban natural history video with WGBY/Channel 57
1995: MA DEM Greenways Grant (\$3,000) for CT River videos with WGBY/ Channel 57
1995: William P. Wharton (\$5,000) for natural history videos with WGBY/ Channel 57
1995: MA DEM Greenways Grant (\$3,000) for natural history day camp for underprivileged city-youth
1993: William P. Wharton Trust (\$4,000) for ecological assessment of Northampton, MA conservation land
1993: MA DEM Greenways Grants Program, 1993 (\$2,375) for ecological inventories Northampton
1992: Graduate Student Summer Research Fellowship, University of Vermont (\$1,000)
1989: B. Elizabeth Horner Fellowship, Smith College (\$1,000)