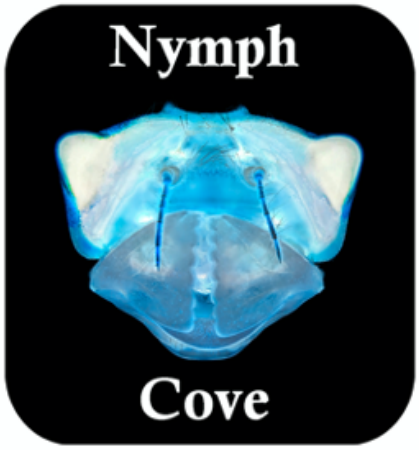
Nymph Cove Installment #6: The Search Is On



By Marla C Garrison and Ken J Tennessen

Now that everyone in the DSA has purchased or fashioned their very own dip nets and assembled all the other necessary equipment, it is time to go out and find those nymphs. Well, come spring anyway. Here we offer some advice on where and how to look for nymphs, more as an overview but we also include some species-specific tips.

Let's break down and discuss basic aquatic habitats, species you might expect to find in them, when you might expect to find final instars (the most accurate stage for keying) and various sampling techniques. Each aquatic habitat has many microhabitats across which individual species are distributed and within which they have become adapted. Specific substrates, water column depths, vegetation structure and biotic communities can vary greatly even within a single body of water and are usually in a state of flux. Also, some species can inhabit several different types of water bodies (e.g., *Basiaeschna janata*, the Springtime Darner, is found in small streams in the south and small to mid-sized lakes up north).

I. Rivers & Streams

Dip netting flowing waterways most often requires a lot of bank kicking. Hip, knee, ankle and even toe action are required. Most stream-inhabiting species will be concentrated along edges where there is a decent mud/sand/silt accumulation (but not thick soft muck). Generally, it is best to avoid scoured banks and edges as exposed hard clay and rock do not provide sufficient cover for odonate nymphs to thrive. Use your feet to dislodge the substrate. Always maneuver your net downstream of the turmoil to collect and strain the nymphs. This method is useful for F-0 nymphs (i.e., final instars) of gomphids in mid-sized to large streams, especially in early spring and again in late fall. In smaller fishless creeks and streamlets, pockets of mud can be dredged for cordulegastrid nymphs that also burrow just beneath the substrate. Members of both families can take two or more years to develop, so you may find multiple instars throughout all seasons. Banks with overhanging and submerged tree roots and wood can be dredged for *Boyeria, Aeshna umbrosa* (Shadow Darner), and some *Somatochlora* species nymphs by raking under and upward along branches and roots; some stream-inhabiting *Somatochlora* species can only be found by digging deep into undercut banks where long grass stems and roots conceal the edge. *Calopteryx* and *Hetaerina* nymphs cling to submerged roots and stems, so the scraping technique works for them as well.

Farther out from the edge, using a long-handled dip net you can sweep backwards against the current whilst shuffling your feet to upset gravel and sand. Sandbars, sandy shoals and sand eddies around fallen tree limbs swept in this manner may uncover *Stylurus* and *Progomphus* species. Areas within the swifter current and with various mixtures of gravel, sand and silt can overturn macromiids which tend to sprawl flattened upon said substrate. Shifting and sifting the substrate at the ripples around rock and boulders (even those out in the middle of the river) can stir up *Ophiogomphus* and *Erpetogomphus* nymphs. If you are looking for *Neurocordulia* nymphs, however, no dip net is needed – just pick up and turn over rocks and logs near the shoreline or out near the riffles where females oviposit; look for them in early spring before their flight season.

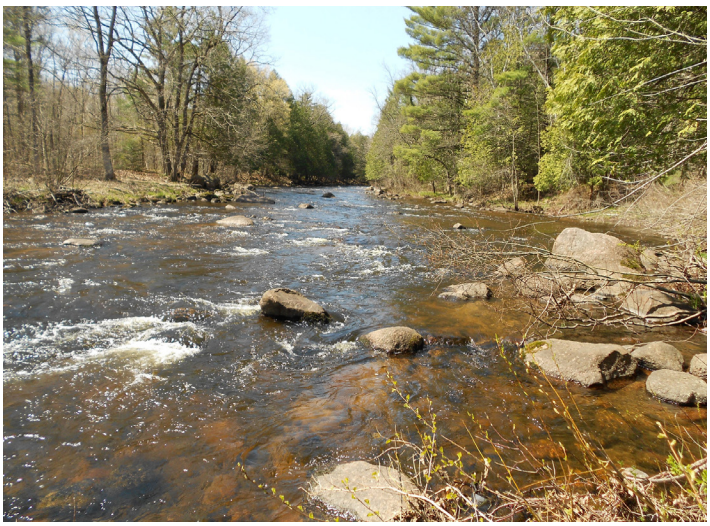


Figure 1. A stream in central Wisconsin.

II. Ponds & Lakes

Still waters are usually easy access and, for the most part, you need only stay close to the shore to find the majority of odonate species that inhabit them. Again, do so by kicking up substrate and scooping up the turbulence. (Choose a dip net with the appropriate length handle for the desired reach and depth.) Substrate and vegetation structure at the edges of these bodies of water can differ greatly and will determine which species you find — mud and muck, sand and silt, columns of aquatic and marshy emergent vegetation, pond weed, lily pads and floating algal mats, boggy sphagnum, leaf litter, and detritus etc. So, always include observations of this kind along with water temperature in your field notes.

Dipping ponds and lakes can be a rewarding way to begin nymphing as they generally yield good numbers of libellulid species throughout the field season. Many libellulids are either univoltine or bivoltine (i.e., one or two broods a year respectively) and have asynchronous emergences. This means final instars of some species may be present during any of the spring, summer and early fall months.

Well-forested edges of muddy ponds and lakes, as well as shady stagnant backwaters and sloughs of rivers or streams, can be rich in *Epitheca* species. Final instars are often found going into the winter in October and November. *Arigomphus* nymphs and some *Phanogomphus* nymphs can be found in ponds with some degree of flowage and just the right charcoal-gray, grainy mixture of sand, silt and mud.

Figure 3. An open marsh in northern Wisconsin.

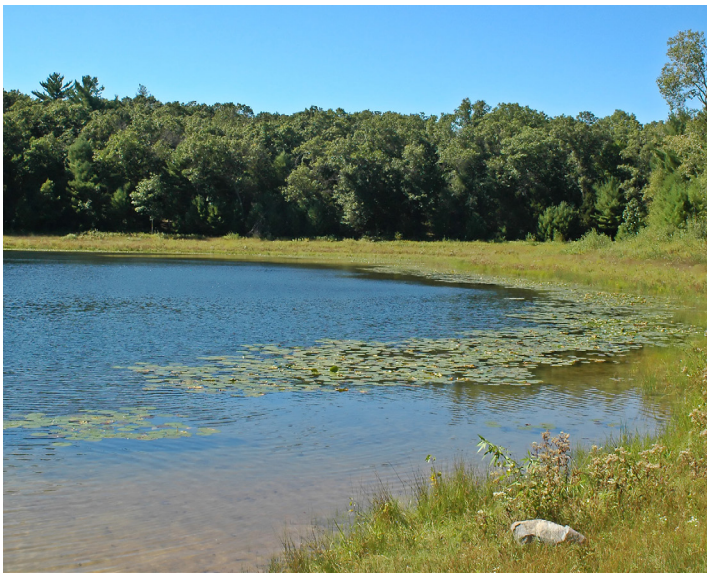


Figure 2. A lake in central Wisconsin.

III. Wetlands & Marshes, Including Temporary Swales

There are so many different types of wetland habitats that this category is difficult to generalize in terms of species encountered. However, one group stands out here — the aeshnids. As climbers they grab and cling to emergent stems and/or sodden wooden debris. The scraping technique is again useful in these environments; dragging the short-handled dip net up the stems of cattails, rushes etc. is a good way to procure *Aeshna* nymphs, many of which do not achieve final instar until mid to late summer months. *Epiaeschna* nymphs inhabit wooded swamps, hiding among dead leaves and other woody debris. Some of these habitats can be dry for a month or more, the nymphs surviving in the moist mud and leaves. Another group that is prevalent in still-water wetlands is the libellulids, especially several *Sympetrum* species. Full-grown nymphs of this genus are found only in a narrow time frame, usually only a couple of weeks right before emergence to adults.

IV. Bogs & Fens

Bogs and fens are special habitats, where *Aeshna*, *Williamsonia*, and numerous species of *Somatochlora*, libellulids and damselflies occur. Although bogs are acidic and fens are calcareous, sampling them entails similar methods. Small dip nets are recommended, as open water in these types of habitats can be limited. Work the dip net in sphagnum pools and around small hummocks; animal trails through a bog or fen, where shallow pockets of water occur, can also be rewarding. Most corduliid nymphs in sphagnum pools will remain quite still in your net and they can also be camouflaged as they are usually "hairy" and can be colored like the sphagnum.

In extremely shallow fens, tread lightly or stay near the edge, as these habitats can be fragile. We feel it necessary to offer a word of caution concerning bog ponds. These ponds are often at the center of a bog and must be reached by trudging in and over quaking sphagnum mats. These mats can be thin in places, so it is possible to break through the mat and find oneself deep in a tangle of plants and water. Such places are dangerous and should be negotiated extremely carefully. Also, the edge of a bog pond can have a sudden, deep drop-off, so be mindful when dip-netting at the edge. Most species in these habitats are not distributed randomly or regularly, instead they are aggregated (clumped, patchy); therefore, persistence and trying different areas of the habitat are needed to find where they are.

We close this installment with an anecdote. Tim Vogt submitted the following image-evoking narrative in order to recount his experiences searching for *Somatochlora hineana* (Hine's Emerald Dragonfly) in a Missouri Fen. This endangered species is generally restricted to areas where seeps and springs provide sheet flow over dolomite bedrock or rubble. Nymphs may take four to seven years to complete development, overwintering in the groundwater that fills *Cambarus diogenes* (Devil Crayfish) burrows. Locating them usually involves lugging heavy machinery out to the burrows and pumping one after the other with little return for time and effort. Here's Tim's take on his hunt for this rare species.

> "About fifteen years ago, while conducting early to mid July (Ozark fen) *S. hineana* presence/absence surveys, I apparently suffered irreparable brain damage (occupational hazard). Ok, try to picture in your minds the following: zero shade + radiant heat + ambient heat + seasonal high humidity + wetland-associated higher humidity. Add to that Kipling's "mad dogs and Englishmen..."
>
> The Somat and the Englishman
>
> the time has come the Somat said
> to speak of many things
> of muck - and seeps - and burrows
> of crayfishes - and genes
> and why the fens are swelt'ring hot
> and whether nymphs have wings

Of course, not all nymph surveys need be so miserable, it all depends on your mission. The above discussion is about as much advice on sampling as we can pack into this installment. There is much to learn on how to find nymphs, especially when looking for particular species. It may seem a bit daunting at first, but we guarantee it will be worth it. The best way to learn is to go with an experienced "nympher" if you get the chance, otherwise you'll have to get into those targeted habitats and do your own diligence.

In the next installment we will provide specifics on preserving and properly curating nymph specimens. Also, in future articles, look for tips on searching for nymphs of certain hard-to-find or rare species. Until then, we hope that when you are out oding that you'll try dipping and journaling the experience. As always, we would love for you to write in with your observations, adventures, stories, poems and/or photos.

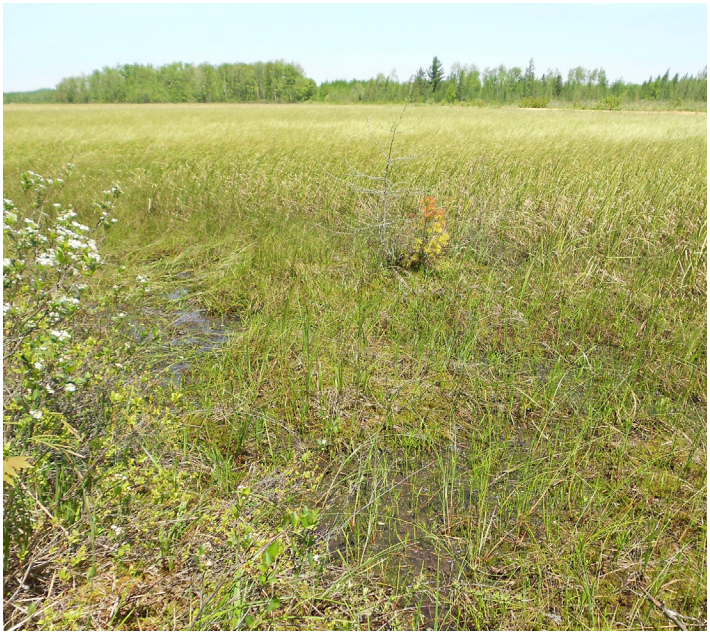


Figure 4. A large fen in central Wisconsin.

Marla Garrison is a faculty member in the Department of Biology at McHenry County College, Crystal Lake, Illinois. She is author of Damselflies of Chicagoland *published online by Chicago's Field Museum https://fieldguides.fieldmuseum.org/guides/guide/388. She may be contacted via email at mgarrison@mchenry.edu or by phone (815)479-7627.*

Ken Tennessen has published over 80 technical papers on Odonata. His recent book, Dragonflies Nymphs of North America, *was published by Springer in 2019.*