



**A Distributional Atlas of Riffle Insects from  
Wisconsin Streams**

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Cover photo *Celithemis eponina* by Casey Scott

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Maps created by Casey Scott  
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Insect communities are a vital part of every water body. They provide a food base for larger organisms, and can also provide insight to the quality of a water resource. Macroinvertebrate samples have been collected for over 25 years in Wisconsin, but the distributions of many taxa have not been updated since Hilsenhoff's work on the Biotic Index in the 1970's and 1980's. The purpose of this book is to provide a comprehensive look at the distributions of insect taxa found in the streams and rivers of Wisconsin, where each has been collected, and the general quality of the waterbodies they inhabit.

### **History of the Biotic Index**

Aquatic macroinvertebrates were first used by Chutter (1972) to assess water quality in South African streams. Hilsenhoff (1977) established sampling protocols and pollution tolerance values for macroinvertebrates used to calculate the biotic index (BI) in Wisconsin streams. Hilsenhoff (1977) assigned organism tolerance values of 0-5 and five grades of water quality classifications from 0 (excellent) to 5 (very poor). Field and laboratory methods and the application of the BI were tested on over 1000 Wisconsin streams. The BI was highly correlated with organic inputs of phosphorus, nitrogen, and chlorides (Hilsenhoff, 1982). In 1987, Hilsenhoff revised many specific organism tolerance values and expanded the scale to 0-10 to improve precision. The scale of water quality classifications was also expanded from 5 to 7 classes (Table 1).

**Table 1. Water quality classifications for the Hilsenhoff Biotic Index (BI) (Hilsenhoff 1987)**

<u>BI Value</u>	<u>Water Quality</u>	<u>Degree of Organic Pollution</u>
0.00-3.50	Excellent	No apparent organic pollution
3.51-4.50	Very Good	Slight organic pollution
4.51-5.50	Good	Some organic pollution
5.51-6.50	Fair	Fairly significant organic pollution
6.51-7.50	Fairly Poor	Significant organic pollution
7.51-8.50	Poor	Very significant organic pollution
8.51-10.00	Very Poor	Severe organic pollution

Hilsenhoff (1988a) developed a family-level biotic index (FBI) to allow for more rapid assessment but found that the FBI was less precise than the BI and suggested that it only be used in situations where a rapid assessment is needed.

Seasonal correction factors for the BI were proposed by Hilsenhoff (1988b) for warm and cold water streams to allow for more accurate assessments for spring and fall surveys. Spring and fall are the best times to sample macroinvertebrates because dissolved oxygen (DO)

levels are usually higher and not limiting. Sampling in summer is not recommended because increased temperature and decreased flow result in lower DO levels. These conditions cause some species to diapause in the egg stage making them unavailable to standard BI sampling methods (Hilsenhoff, 1988b). To further improve the precision and reduce seasonal variability of the BI Hilsenhoff (1998) suggested limiting the individuals of each taxon used in BI calculations to 10 and suggested that sampling could occur at any time of the year using this modification. This modification reduces the effect of “sample swamping” that may occur and is associated with life history phenomena such as emergence, when high numbers of individuals stage in specific microhabitats.

Lillie and Schlessler (1994) developed a mean tolerance index (TBI), essentially a modified BI, which weighed the values of rare and dominant taxa equally by including only one individual for each taxon used in the calculations. This index is less prone to temporal variation than the BI and can be used along with the BI to determine long term trends in water quality, but appears to be less sensitive (Hilsenhoff, 1998).

The greatest advantage of using a BI to assess water quality rather than chemical analysis is that it provides an insight into stream water quality over a longer period. Macroinvertebrates are exposed to a dynamic system throughout their life cycles and must endure substantial changes to chemical and physical variables of their environment. The tolerance status of a macroinvertebrate community is therefore an excellent barometer of stream conditions throughout the year. However, it should be noted that the BI is most effective when used to detect organic pollution and nutrient enrichment (Hilsenhoff, 1977).

### **Data Used for Figures**

The data used to generate the figures in this book are from samples collected by various agencies and academic researchers and processed by the University of Wisconsin Stevens Point (UWSP) Aquatic Entomology Laboratory. The University database consists of 13,493 samples collected from 10,175 locations. Samples were collected primarily from riffles of wadeable streams between 1978 and 2009. Over 2.3 million specimens have been identified and recorded in the database. The database was created by and maintained by Dr. Stanley Szczytko and the taxonomy was performed or supervised by Jeff Dimick. The quality of this database can be attributed to the persistent efforts of these individuals over many years. All major orders of aquatic insects are included in this book except Diptera.

### **Rare Taxa**

Taxa depicted as rare in this book may be so for a variety of reasons. Some taxa are found primarily in lentic habitats and generally are not collected in riffle samples. For example,

most genera of dragonflies are underrepresented because they typically do not inhabit riffles. Other taxa are found mainly in large rivers that are not accessible to the D-frame kick-netting used to collect the samples in this database. The burrowing mayfly genus *Hexagenia* is very common in the Mississippi River valley, but it typically inhabits large sand or silt-bottomed rivers that must be sampled by boat. Insects utilizing specialized microhabitats may appear to be rare because their preferred habitat exists in small patches and/or is not often sampled. This means the taxa is rarely encountered despite its common occurrence in the state. Other taxa may be truly rare in Wisconsin. The mayfly family Behningiidae has not been recorded by the UWSP laboratory and only a few occurrences have been recorded by other studies in the state.

### **Understanding the Figures**

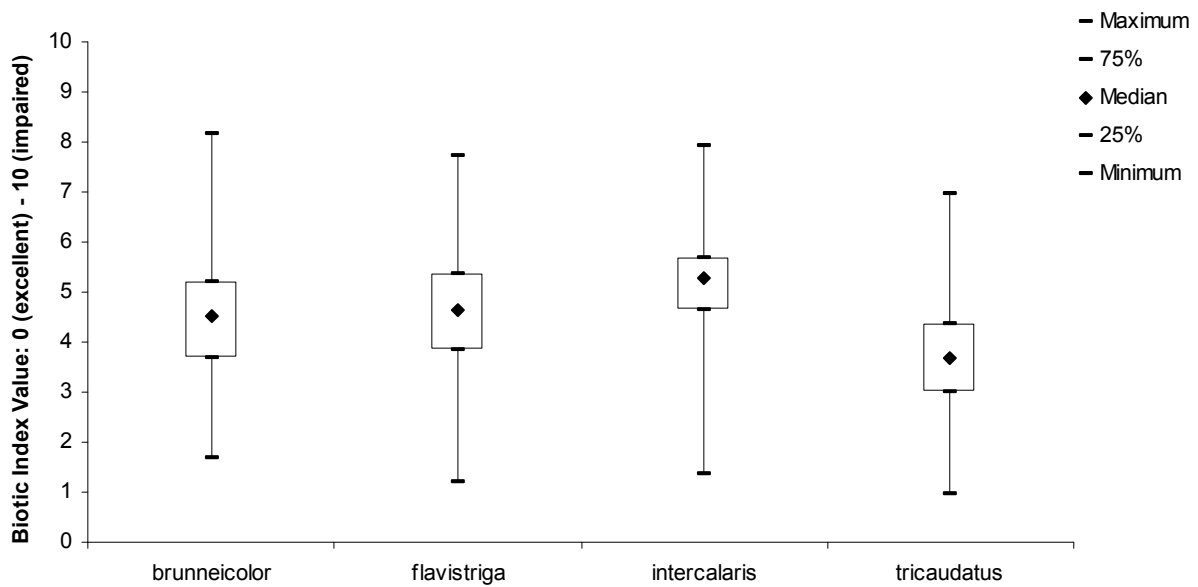
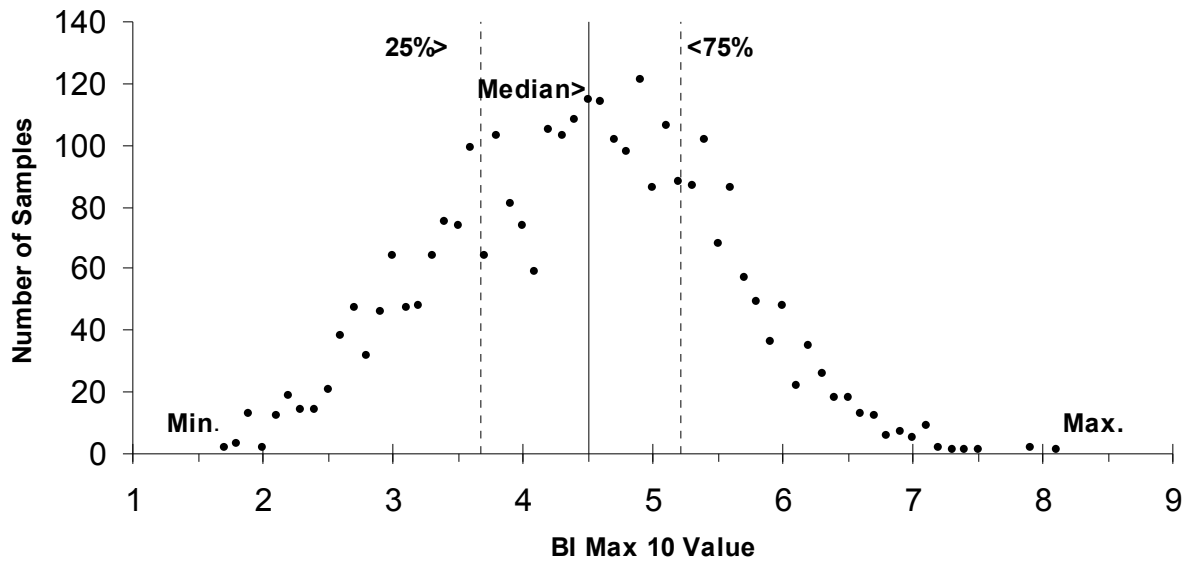
Each map represents the distribution and abundance of a taxon from 1978-2009. It is important to note that the semi-qualitative nature of BI samples can be a limiting factor for abundance measures. Material in a BI sample is divided evenly in a gridded pan; and grids are randomly selected and sorted until 125 organisms are found. Actual abundance may be higher because not every sample is sorted entirely.

County boundaries serve as a background layer to assist in understanding the distributions. The county boundaries are also found on the base maps in the first chapter so distributions can be compared by ecoregions and hydrologic features. The abundance scale was generated by calculating the maximum number of insects found at a site.

The graph below the map represents the range of water quality the taxon typically inhabits. All classifications are based on Hilsenhoff's Biotic Index Max 10 modification (1987, 1998). A box and whisker plot was chosen to allow comparison of multiple taxa simultaneously. This plot contains the same information as a histogram, but displays only the minimum, 25% quartile, median, 75% quartile, and maximum (Fig. 1). The uppermost mark on the graph is the maximum BI Max10 value recorded for the taxon, or most impaired stream sample the taxon has been collected from. The top of the box is the BI Max10 value that 75% of the samples were below. The middle dot represents the median BI Max10 score for that taxon. The median was used instead of the mean because the median represents the middle value of the dataset and is less influenced by few extreme outliers. The bottom of the box is the level that represents the lowest 25% of the samples. The insect on display will be found in waters less impaired than this 25% of the time. The bottom mark is the lowest BI value recorded in a sample containing the taxon.

It is important to note that the quartiles are referring to samples, not individual insects. This means a sample containing one insect is counted the same as a sample containing 10

**Figure 1:** Sample histogram and whisker plot for *Baetis brunneicolor*. Note whisker plot is a summary of the histogram and allows multiple taxa to be compared.



insects. This could narrow the 25-75% quartiles because the majority of individuals would be expected to be found near their assigned tolerance value.

### Taxonomy and Names of Insects

Scientific names are the most effective way to identify insects because the combination of genus and species names creates a unique identity for each type of insect. Common names can be useful at higher levels of identification such as order and family, but are not always practical at the genus and species level. The Odonates (dragonflies) and some other orders have



been taxonomically stable for a long time, and their common names are generally agreed on.

In contrast, the order Ephemeroptera (mayflies) , lacks a comprehensive system of common names. The combination of frequent taxonomic changes and different regional names used by fisherman has created confusion when calling a mayfly by a common name. For example, the common name Blue-Winged Olive refers to the genus *Baetis*; so *B. brunneicolor*, *B. flavistriga*, *B. intercalaris*, and *B. tricaudatus* all share the same name. However, common names are provided where applicable throughout the book and are marked by family (F), genus (G), and species (S).

Taxonomy is a dynamic endeavor and revisions are frequently introduced. The taxonomy list used to generate the database and this book can be found at the UWSP-AEL website. (<http://www.uwsp.edu/water/biomonitoring/index3.htm>)

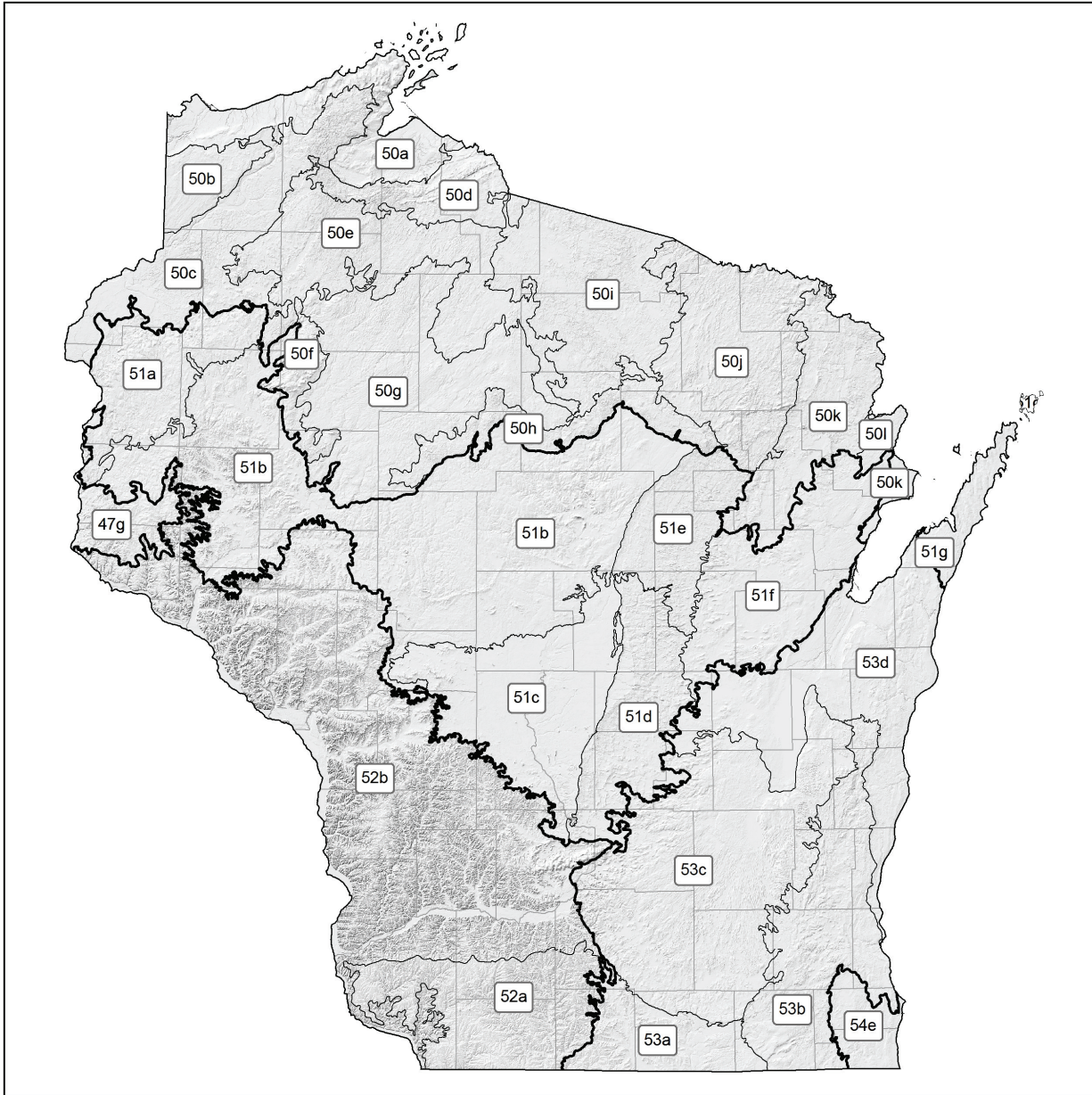


Figure 2: County boundaries of Wisconsin (WI DNR, 2007).



**Figure 3 - River Systems of Wisconsin (WDNR, 2007)**

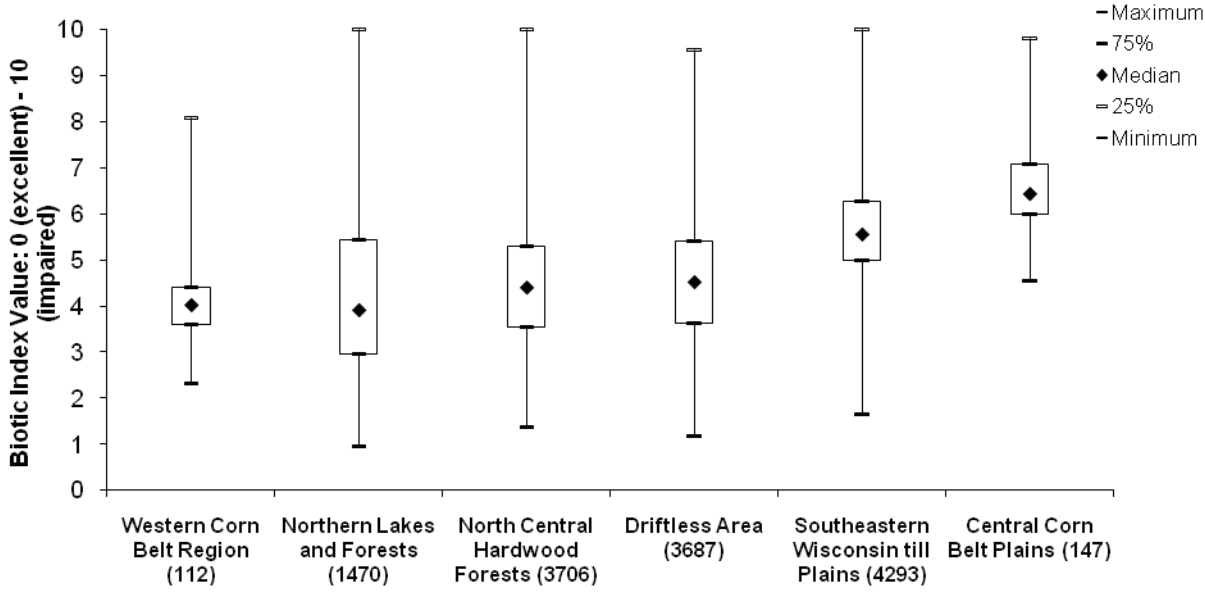
- |                          |                    |
|--------------------------|--------------------|
| 1 Pine                   | 17 Grant - Platte  |
| 2 Peshtigo               | 18 Pecatonica      |
| 3 Oconto                 | 19 Root - Pike     |
| 4 Upper Chippewa         | 20 Lower Rock      |
| 5 Lower Chippewa         | 21 Illinois Fox    |
| 6 Suamico                | 22 Lake Winnebago  |
| 7 Black                  | 23 Kewaunee        |
| 8 Upper Wisconsin        | 24 Lake Superior   |
| 9 Buffalo                | 25 Milwaukee       |
| 10 Trempealeau           | 26 Wolf            |
| 11 Lower Fox             | 27 Upper Fox       |
| 12 Manitowoc             | 28 St. Croix       |
| 13 Baraboo - Wisconsin   | 29 Upper Rock      |
| 14 Sheboygan             | 30 LaCrosse        |
| 15 Bad Axe - Mississippi | 31 Lower Wisconsin |
| 16 Sugar                 |                    |



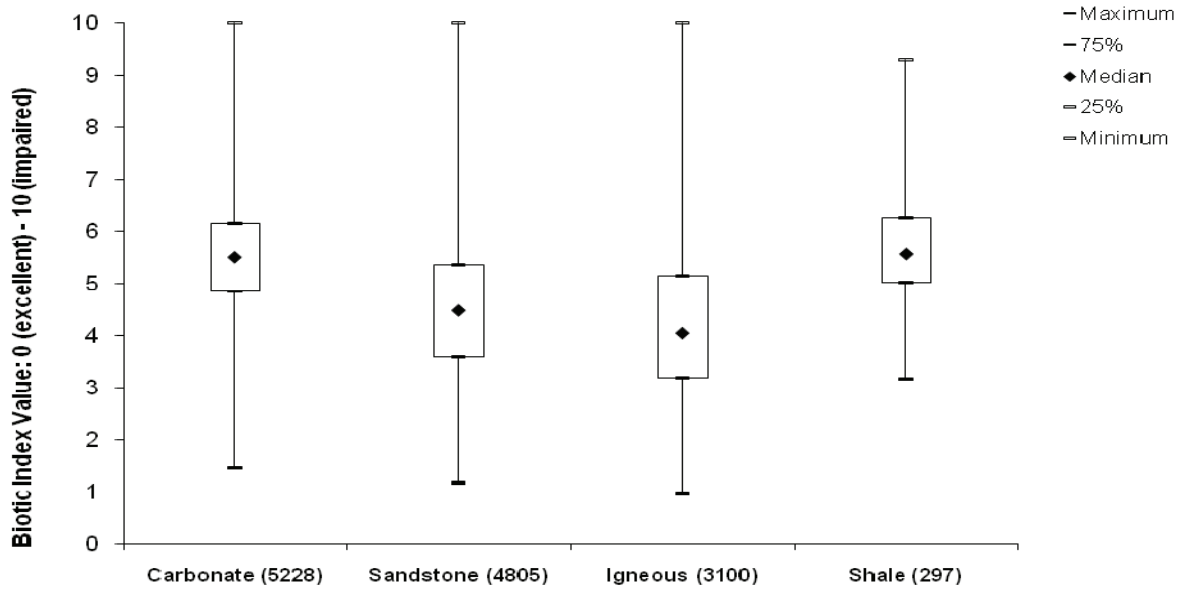
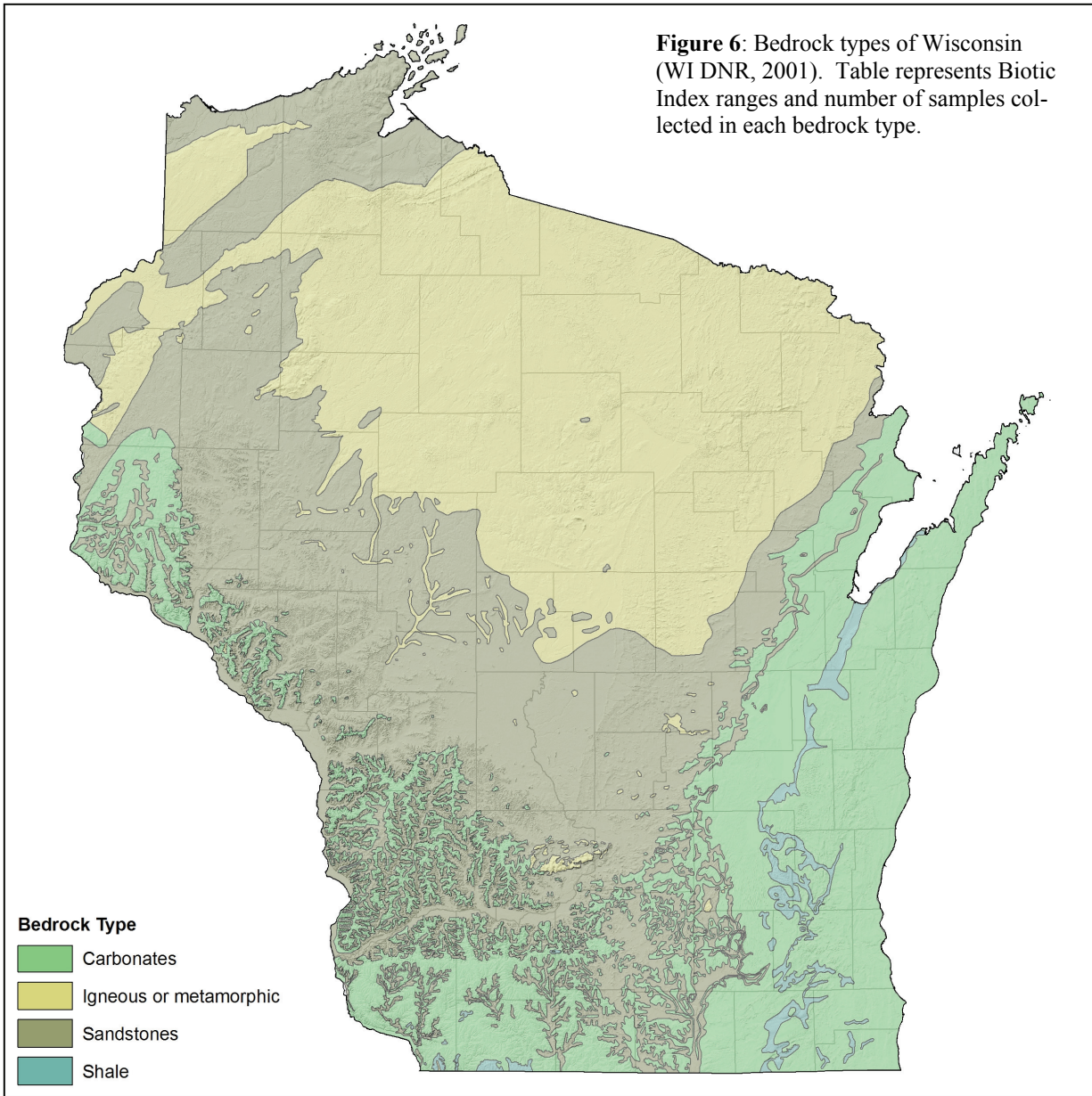
**Figure 4: Ecoregions of Wisconsin (Omernik, 1998)**

- |  |   |
|--|---|
| <p><b>47 Western Corn Belt Region</b><br/>           47g Prairie Pothole Region</p> <p><b>50 Northern Lakes and Forests</b><br/>           50a Lake Superior Clay Plain<br/>           50b Minnesota/Wisconsin Upland Till Plain<br/>           50c St. Croix Pine Barrens<br/>           50d Ontonagon Lobe Moraines and Gogebic Iron Range<br/>           50e Chequamegon Moraine and Outwash Plain<br/>           50f Blue Hills<br/>           50g Chippewa Lobe Rocky Ground Moraines<br/>           50h Perkinstown End Moraine<br/>           50i Northern Highlands Lakes Country<br/>           50j Brule and Paint River Drumlins<br/>           50k Wisconsin/Michigan Pine and Oak Barrens<br/>           50l Menominee Ground Moraine</p> | <p><b>51 North Central Hardwood Forests</b><br/>           51a St. Croix Stagnation Moraines<br/>           51b Central Wisconsin Undulating Till Plain<br/>           51c Glacial Lake Wisconsin Sand Plain<br/>           51d Central Sand Ridges<br/>           51e Upper Wolf River Stagnation Moraine<br/>           51f Green Bay Till and Lacustrine Plain<br/>           51g Door Peninsula</p> <p><b>52 Driftless Area</b><br/>           52a Savanna Section<br/>           52b Coulee Section</p> <p><b>53 Southeastern Wisconsin Till Plains</b><br/>           53a Rock River Drift Plain<br/>           53b Kettle Moraines<br/>           53c Southeastern Wisconsin Savannah and Till Plain<br/>           53d Lake Michigan Lacustrine Clay Plain</p> <p><b>54 Central Corn Belt Plains</b><br/>           54e Chippewa Prairie Region</p> |
|--|---|

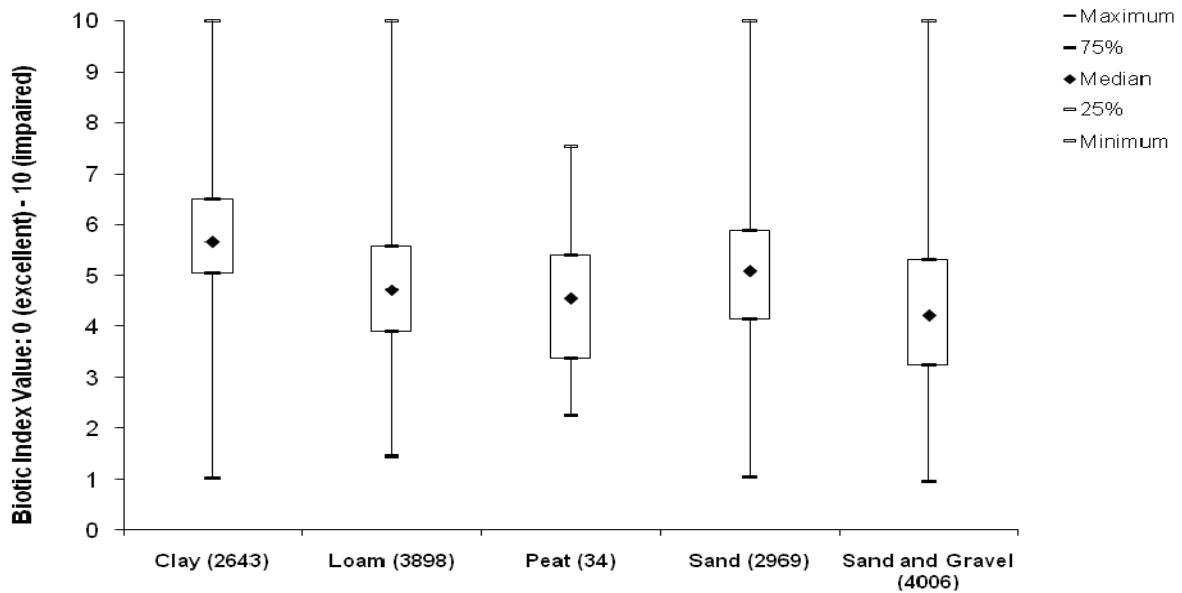
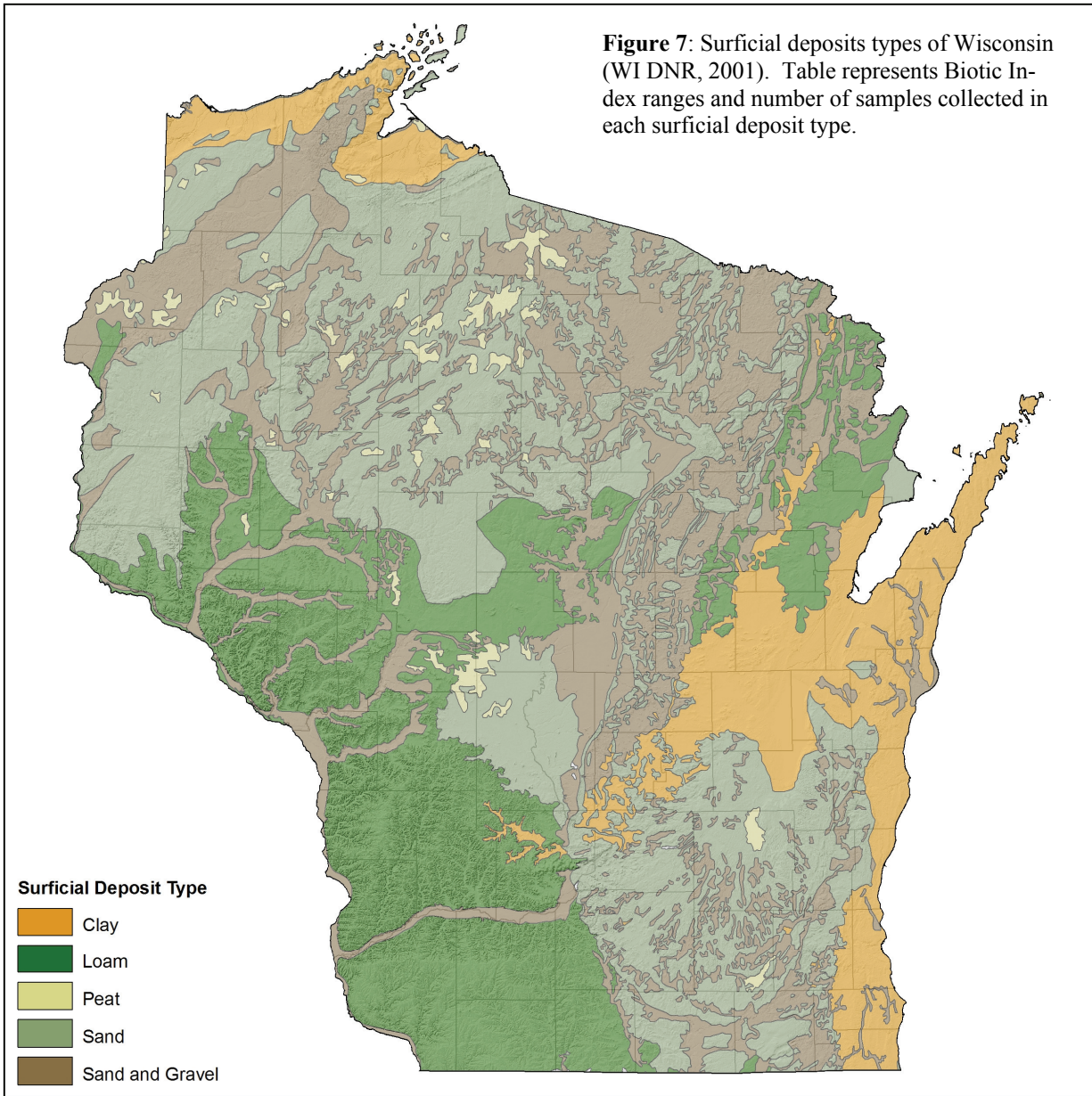
**Figure 5:** Biological water quality samples collected in Wisconsin riffles from 1978-2009. Table represents Biotic Index ranges and number of samples collected in each ecoregion.



**Figure 6:** Bedrock types of Wisconsin (WI DNR, 2001). Table represents Biotic Index ranges and number of samples collected in each bedrock type.



**Figure 7:** Surficial deposits types of Wisconsin (WI DNR, 2001). Table represents Biotic Index ranges and number of samples collected in each surficial deposit type.







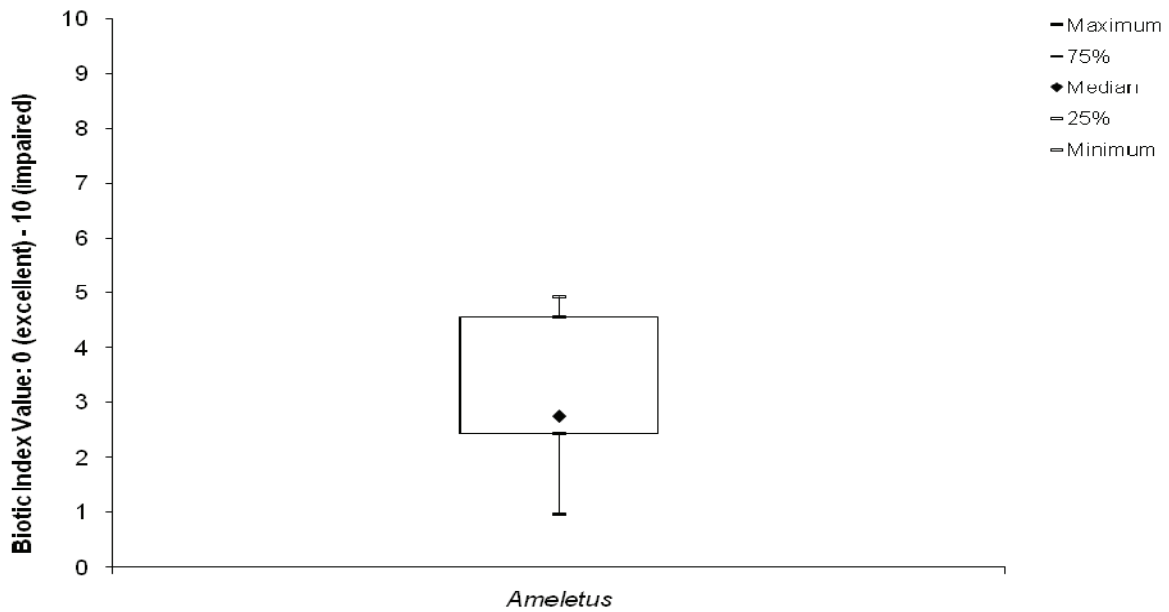
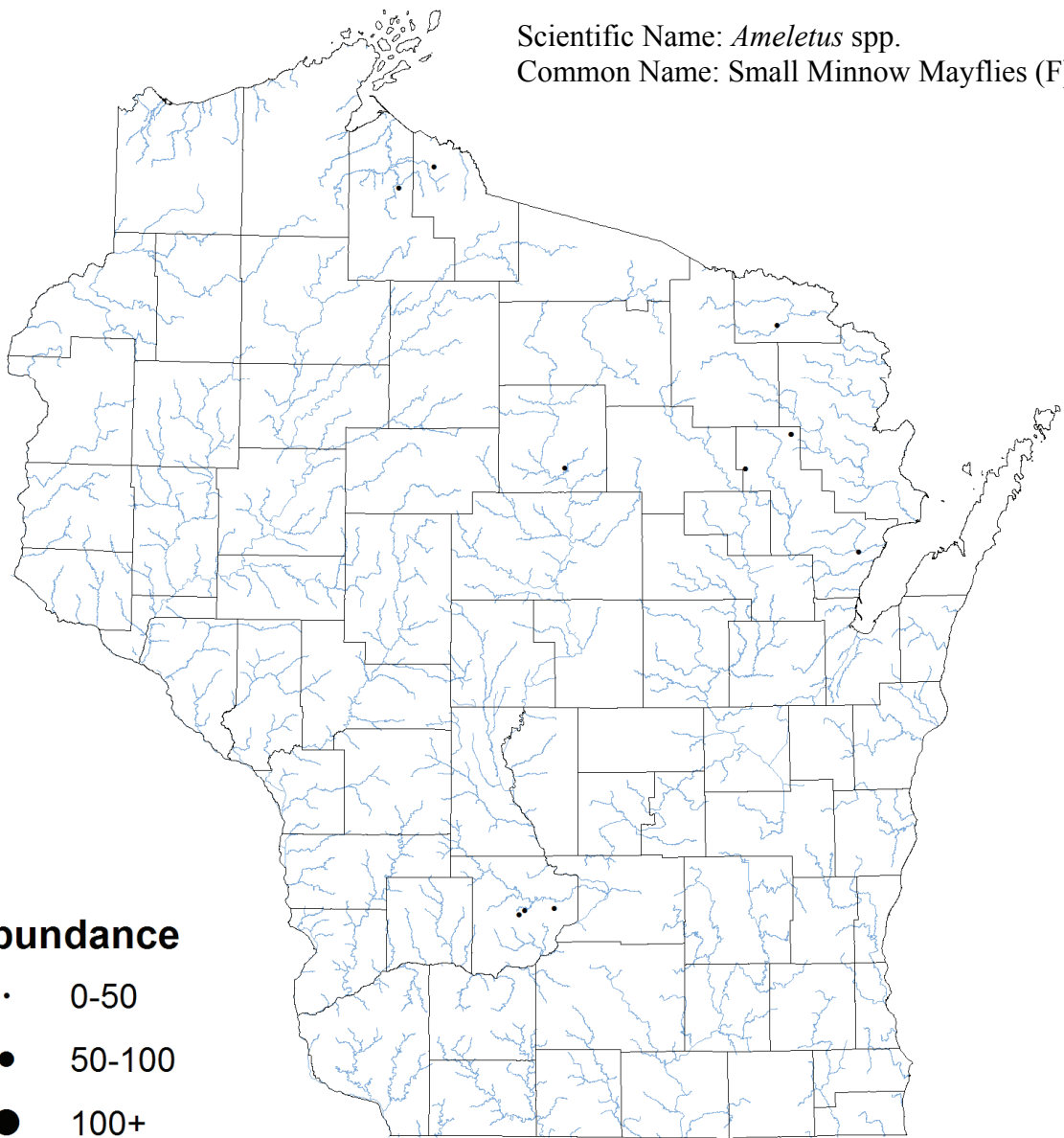
## Section I: Ephemeroptera (Mayflies)

# Ephemeroptera Ameletidae

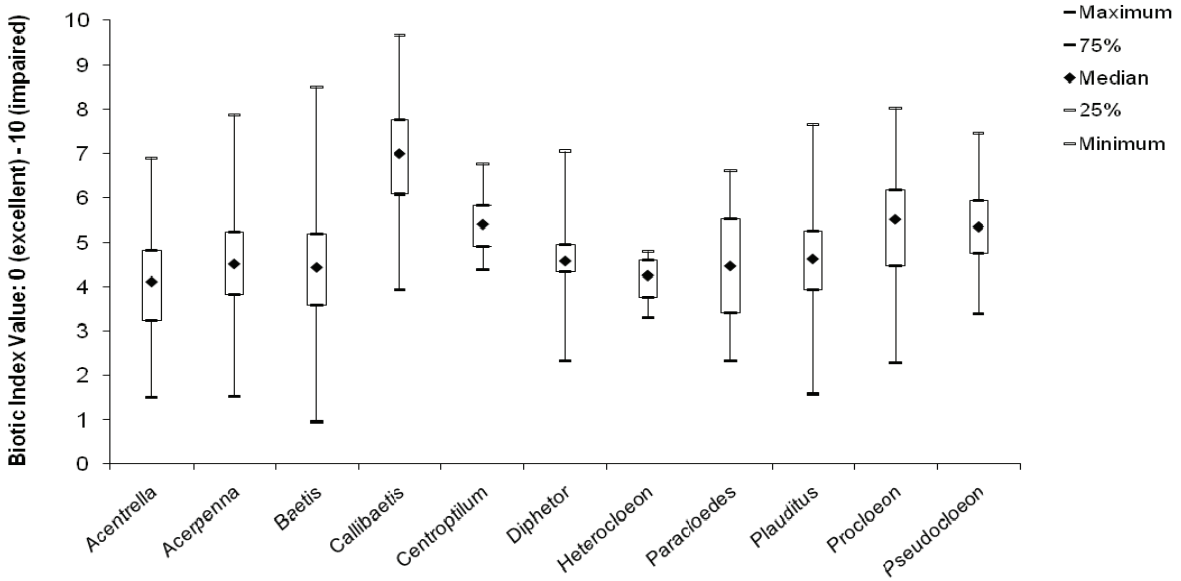
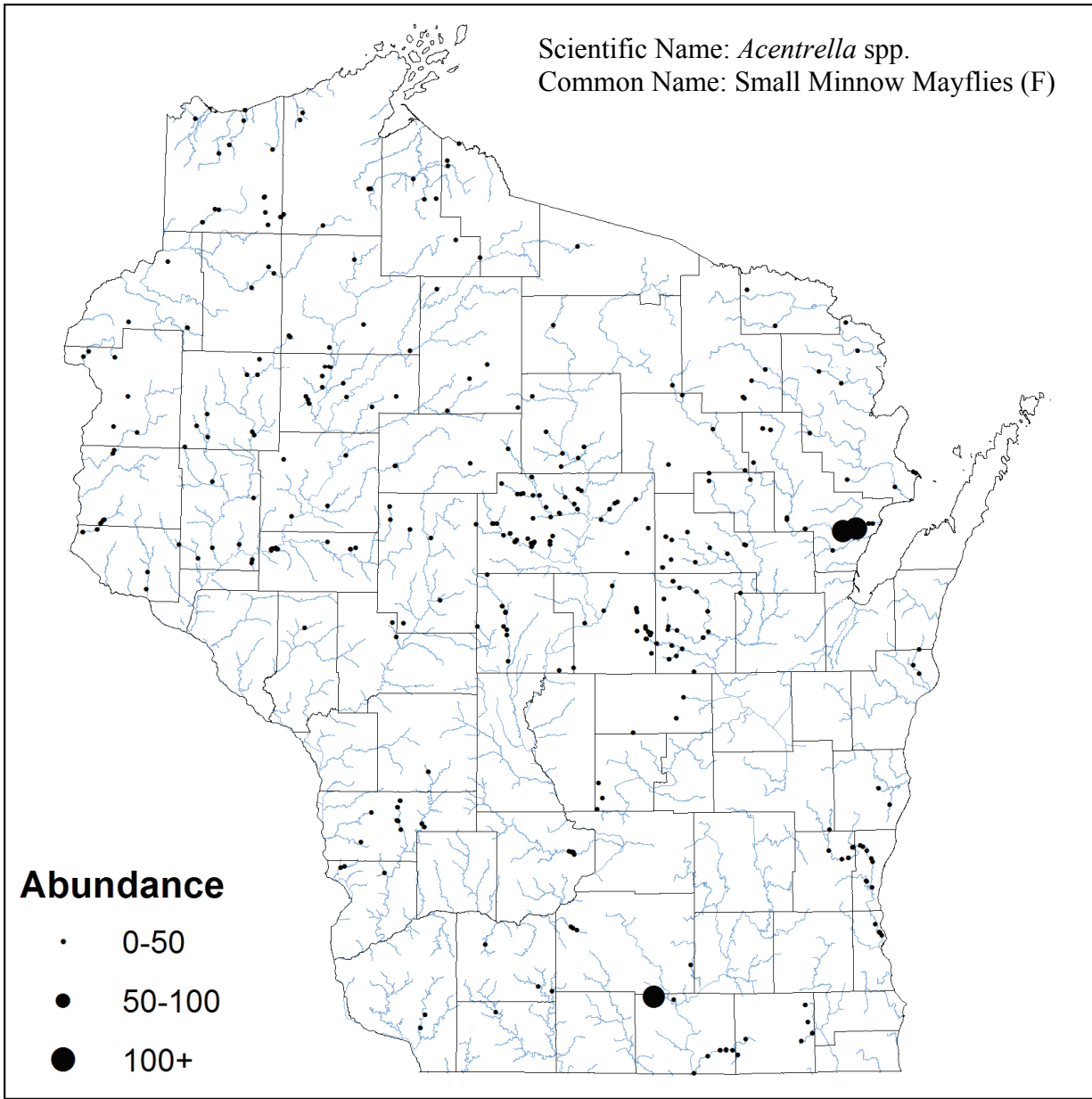
Scientific Name: *Ameletus* spp.  
Common Name: Small Minnow Mayflies (F)

## Abundance

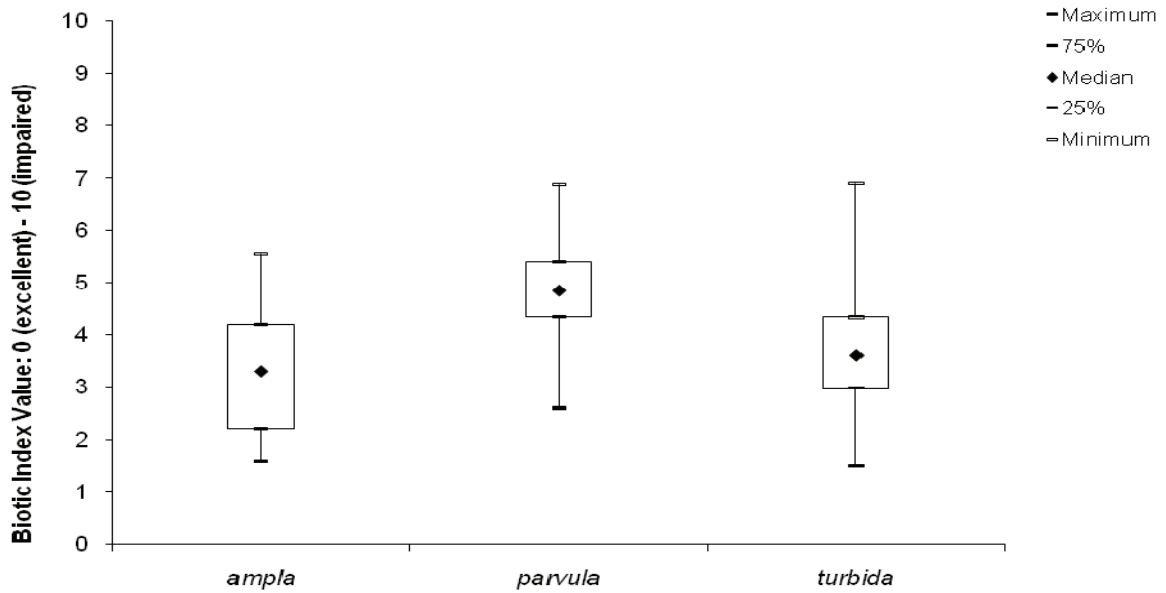
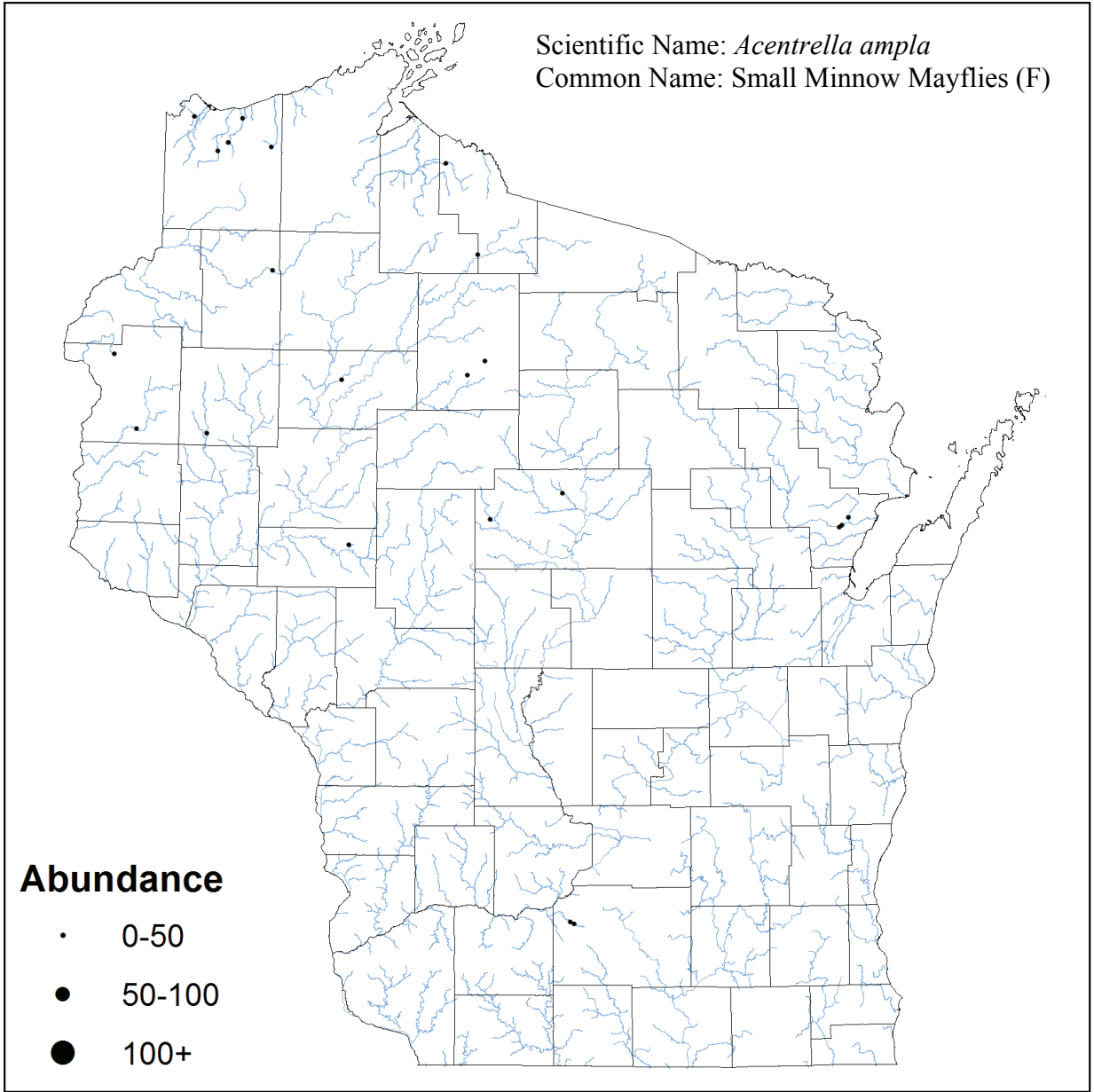
- 0-50
- 50-100
- 100+



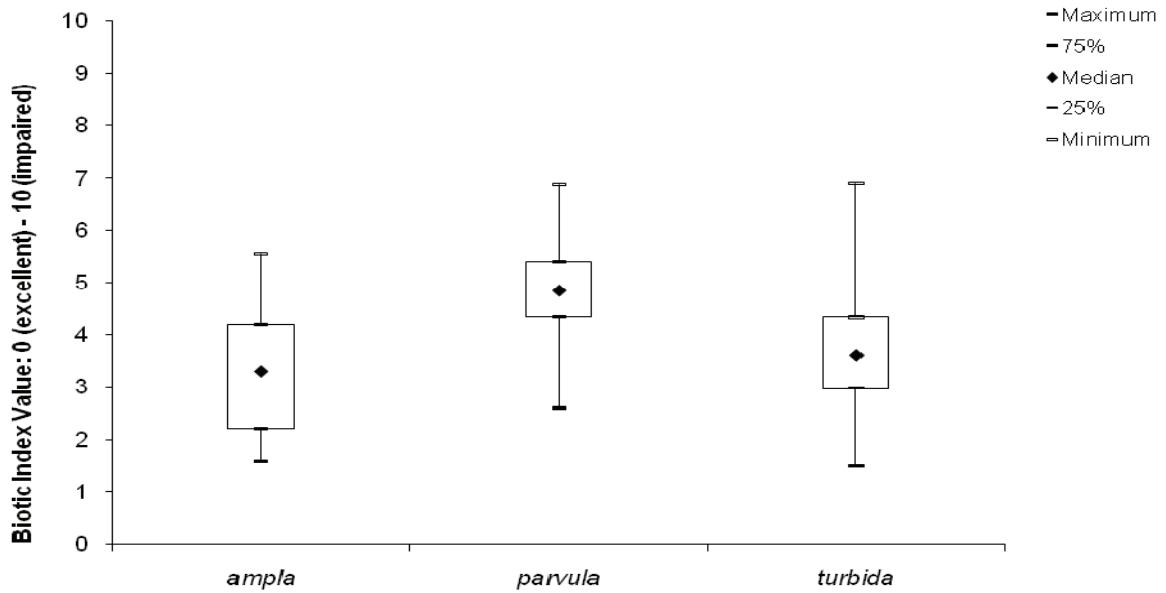
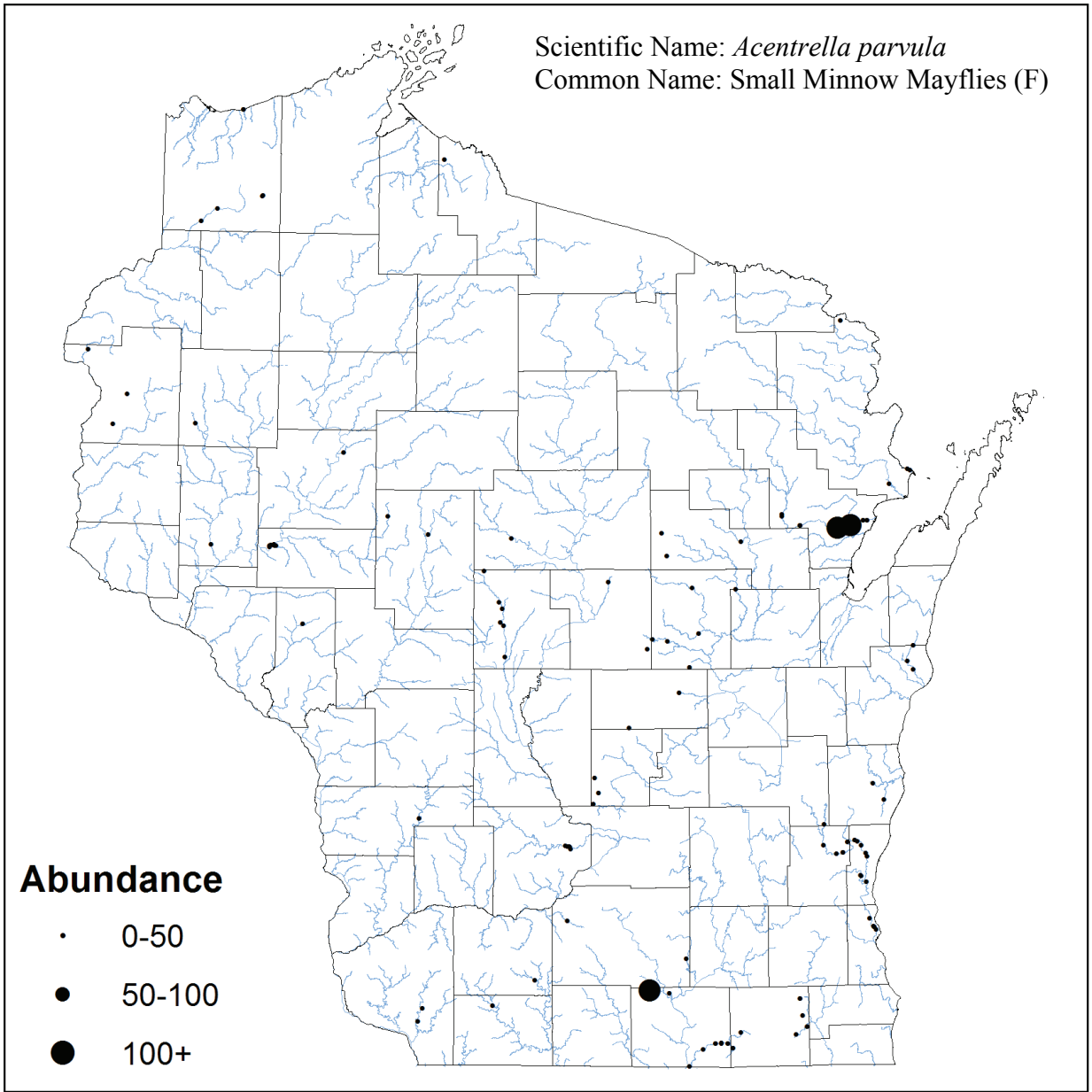
# Ephemeroptera Baetidae



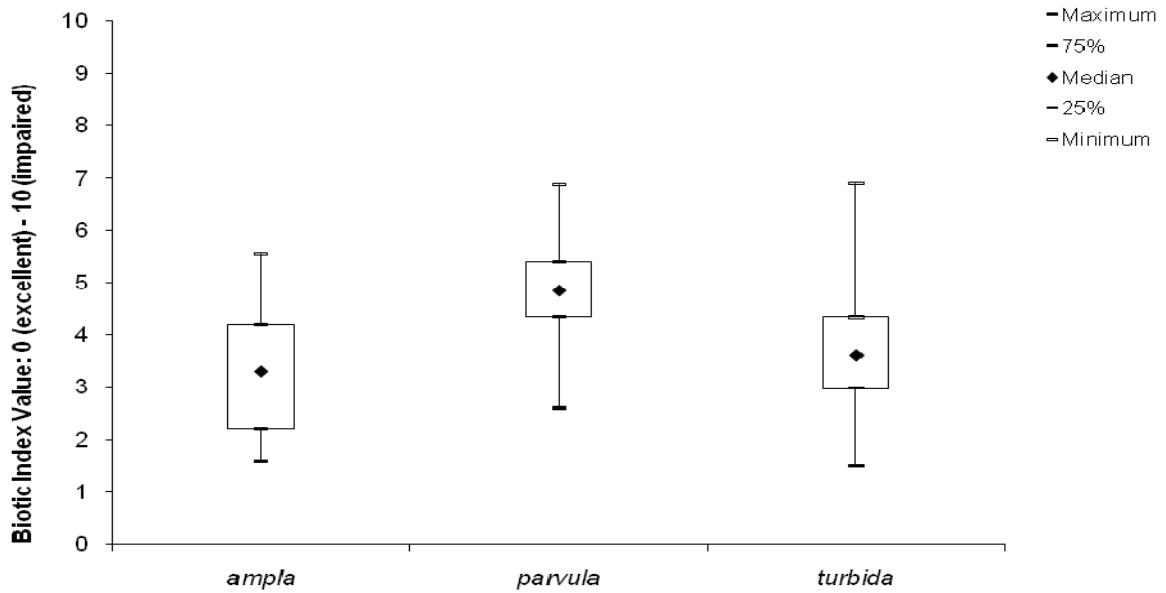
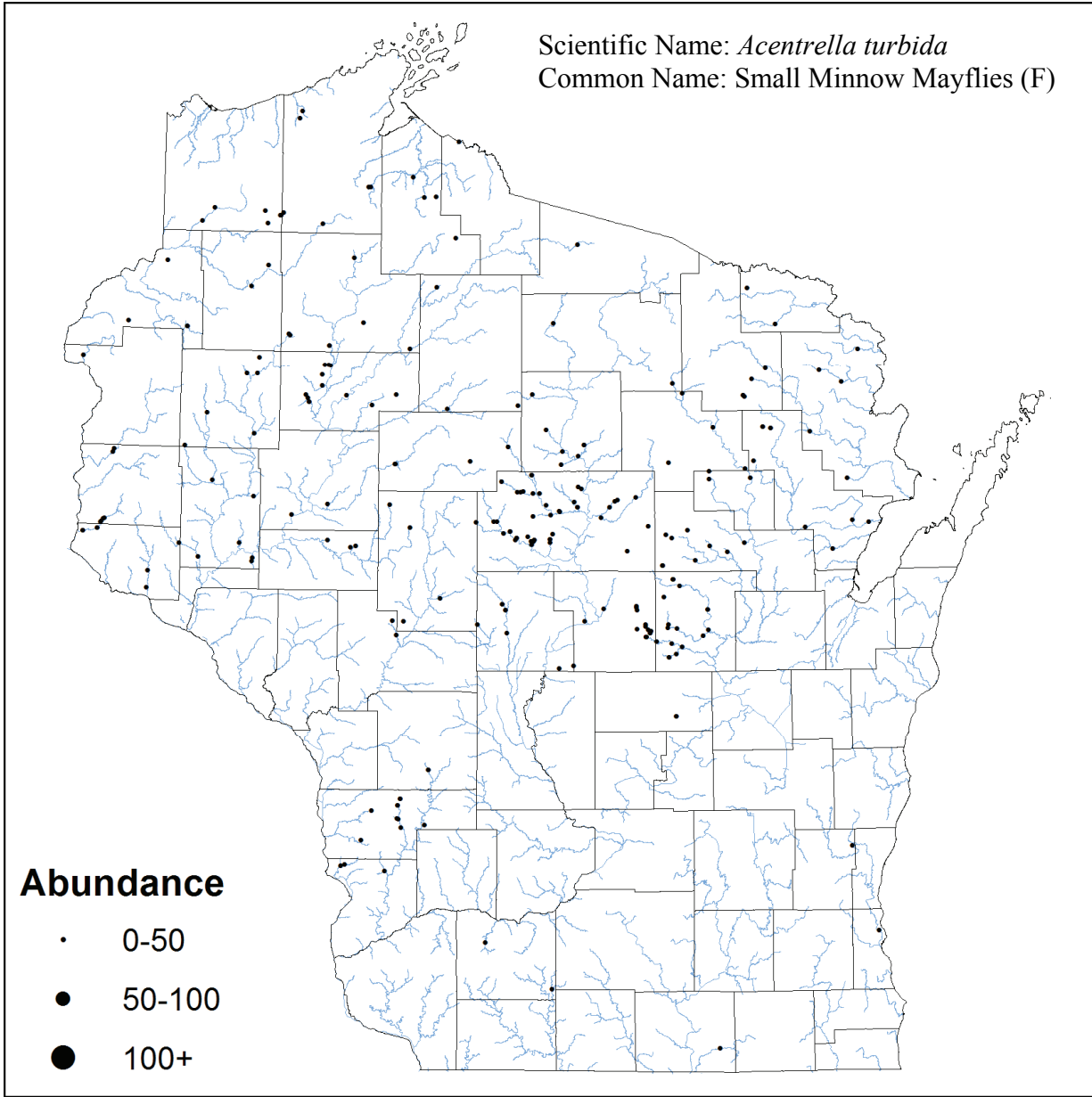
# Ephemeroptera Baetidae



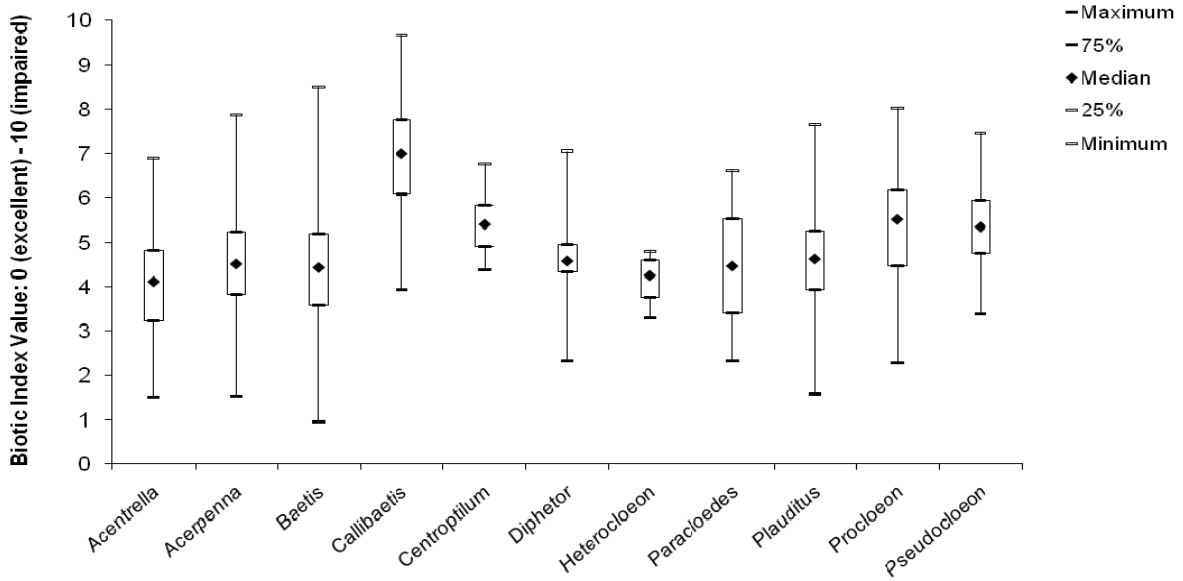
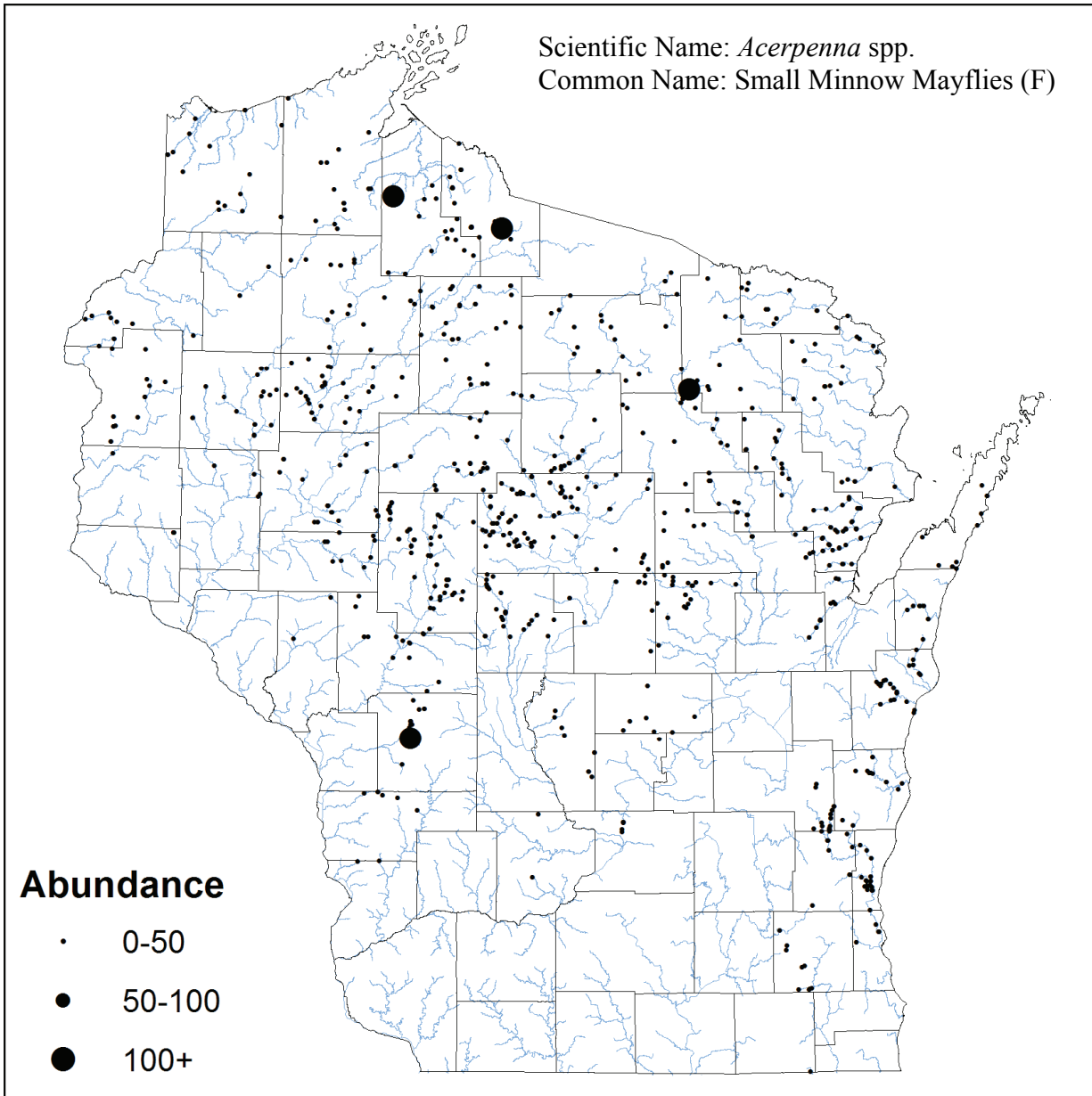
# Ephemeroptera Baetidae



# Ephemeroptera Baetidae



# Ephemeroptera Baetidae

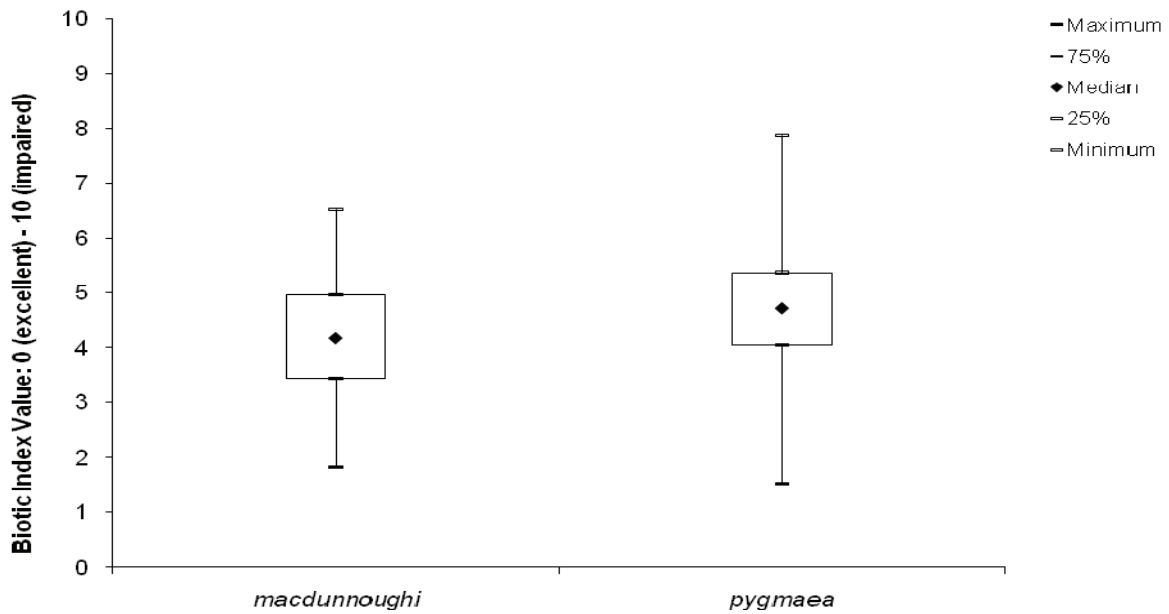
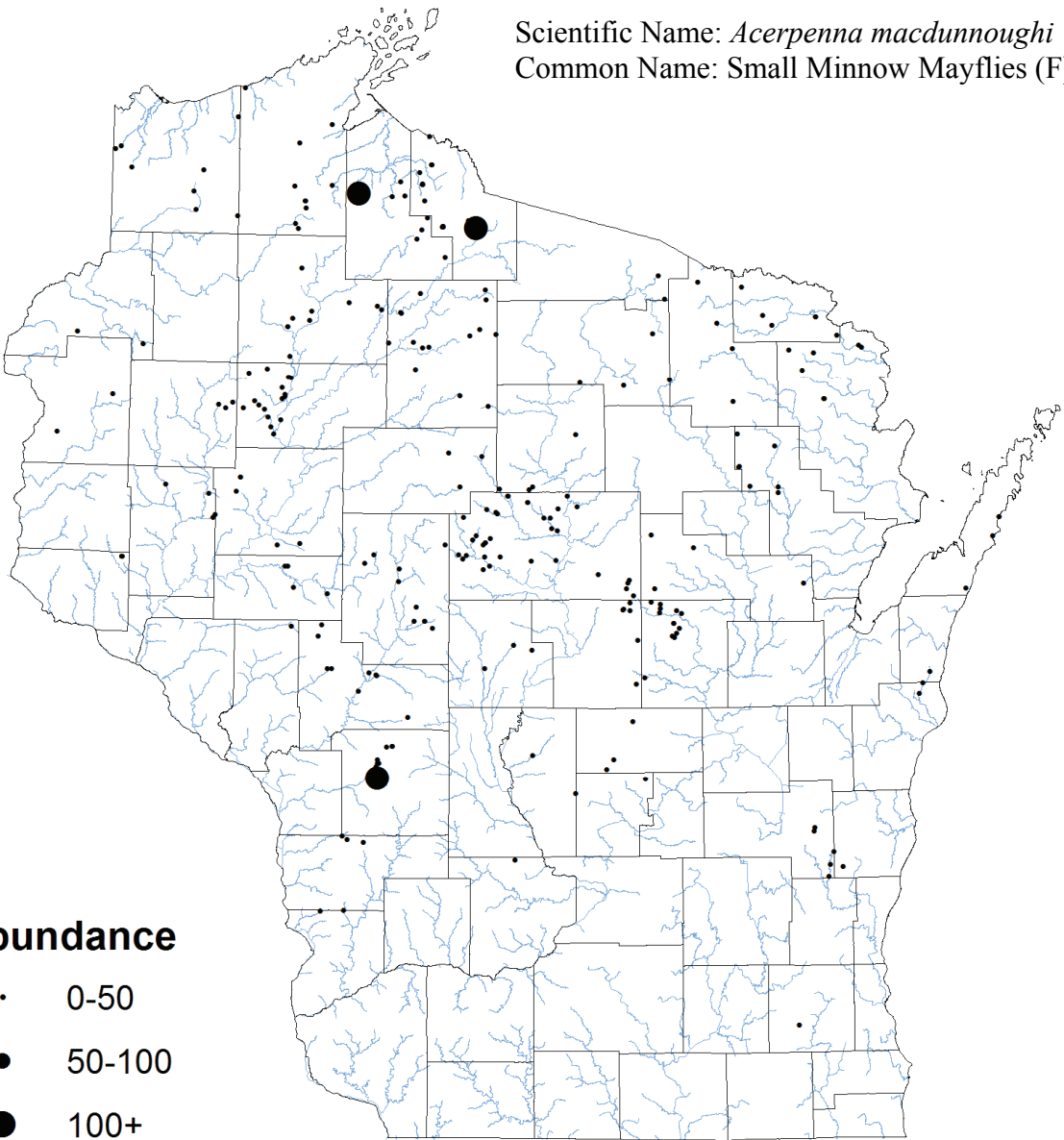


# Ephemeroptera Baetidae

Scientific Name: *Acerpenna macdunnoughi*  
 Common Name: Small Minnow Mayflies (F)

## Abundance

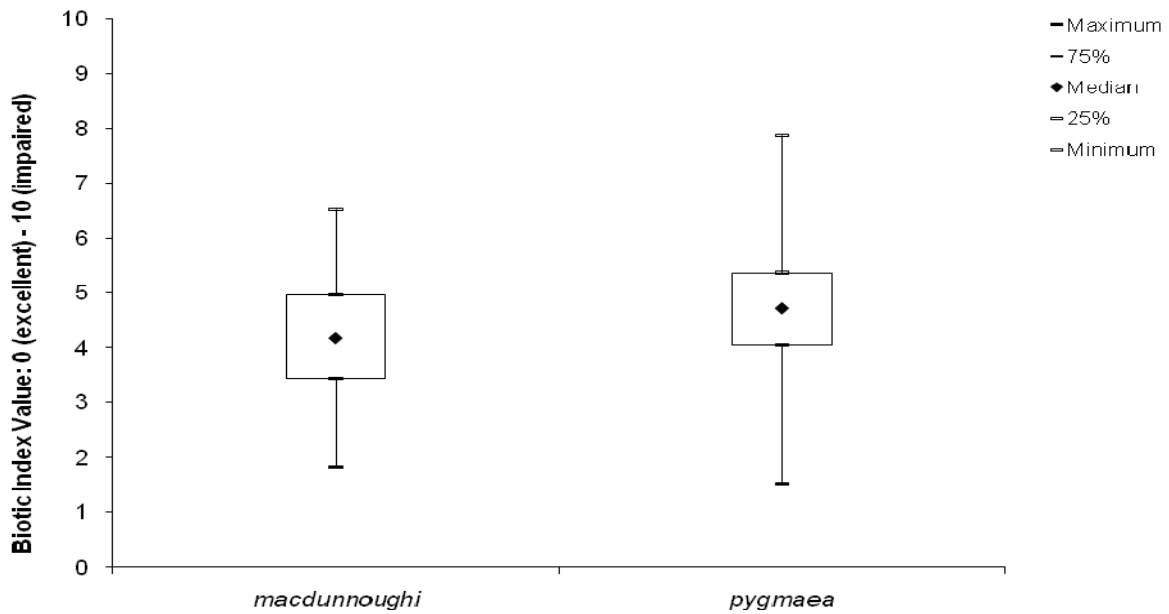
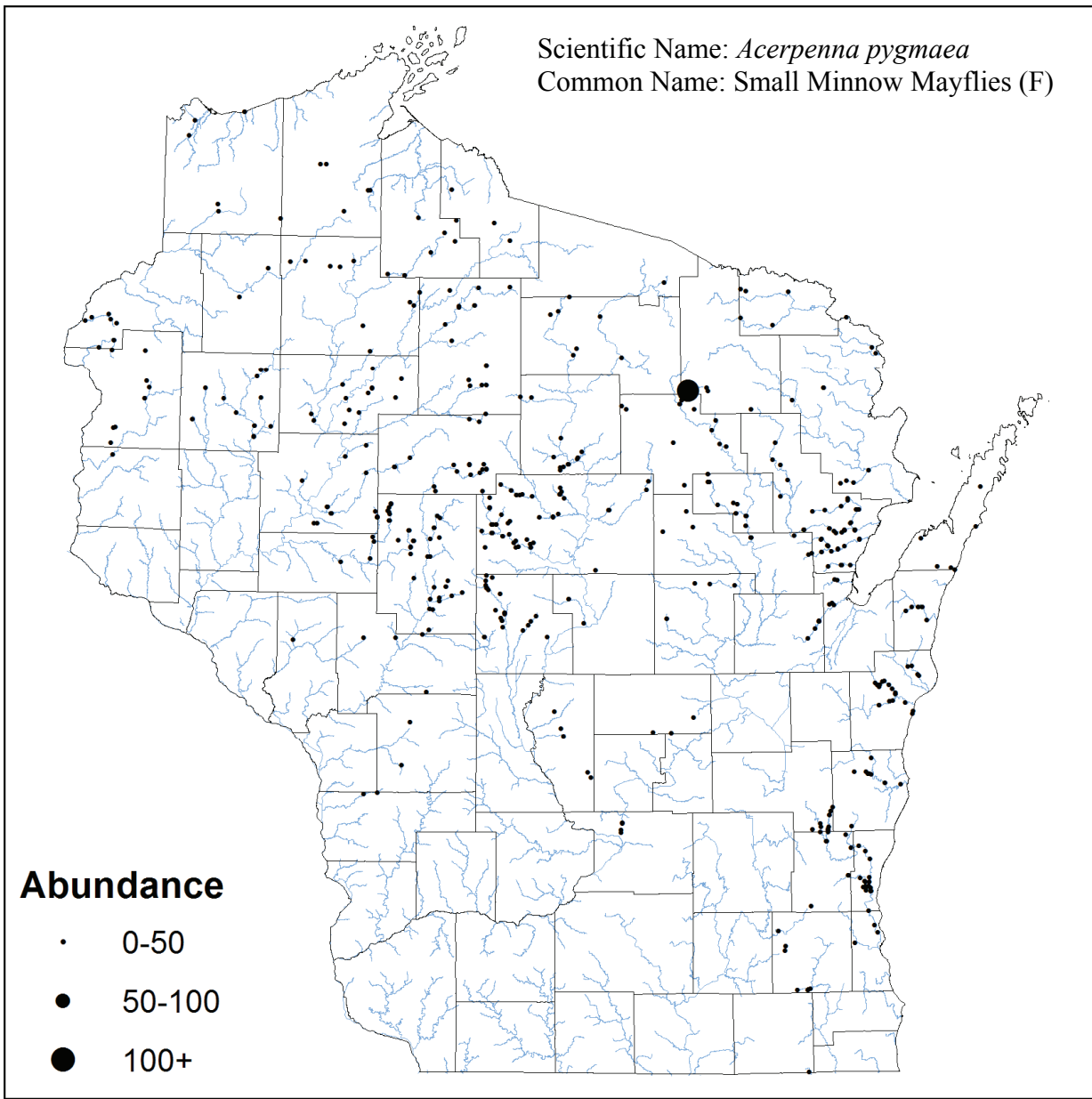
- 0-50
- 50-100
- 100+



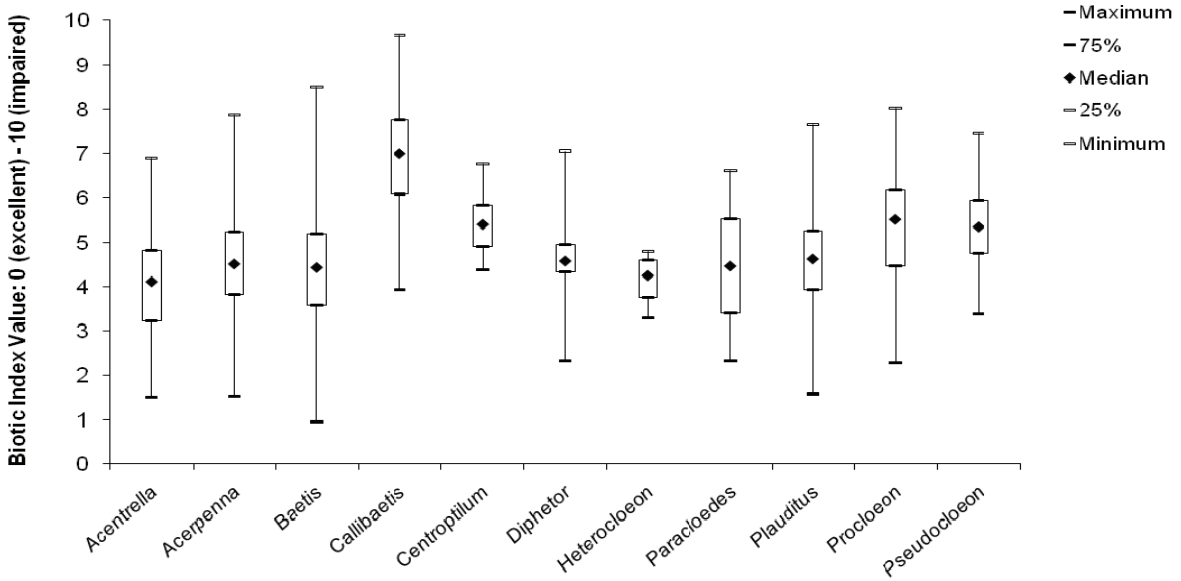
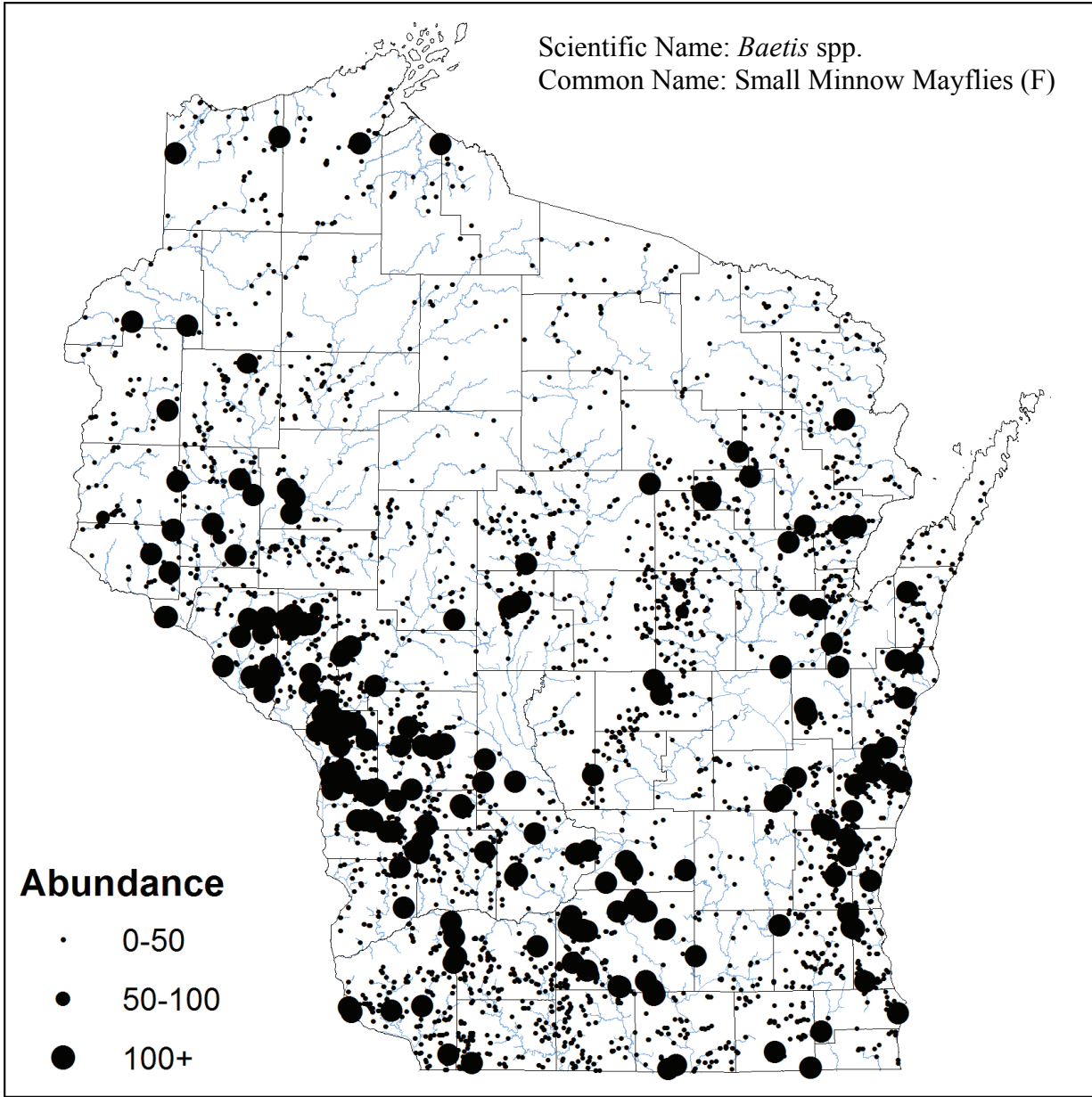


Ephemeroptera Baetidae

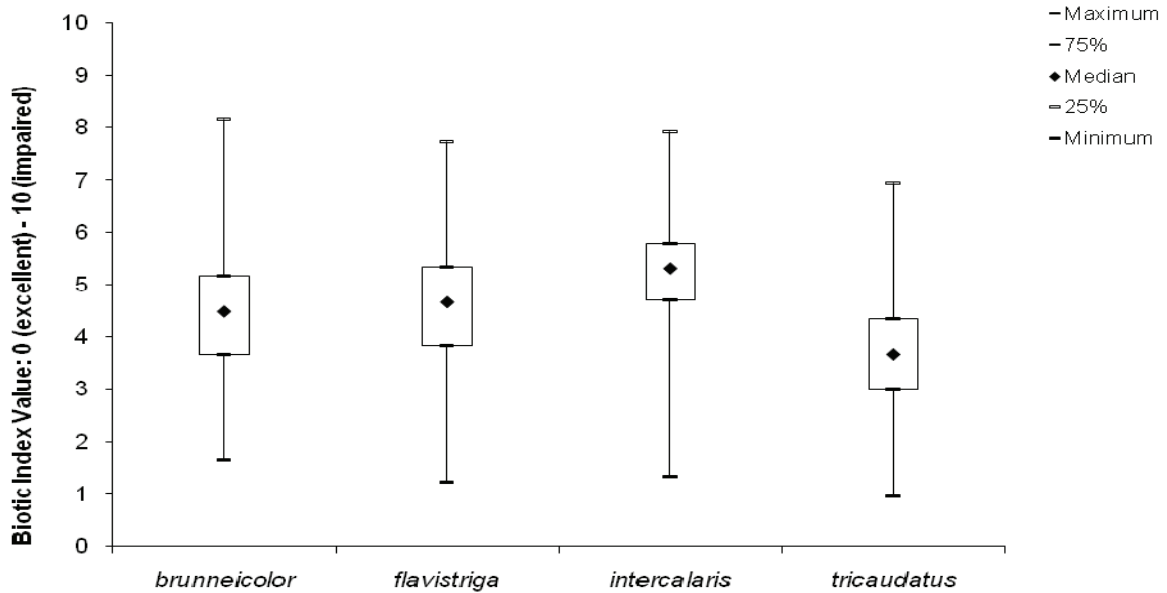
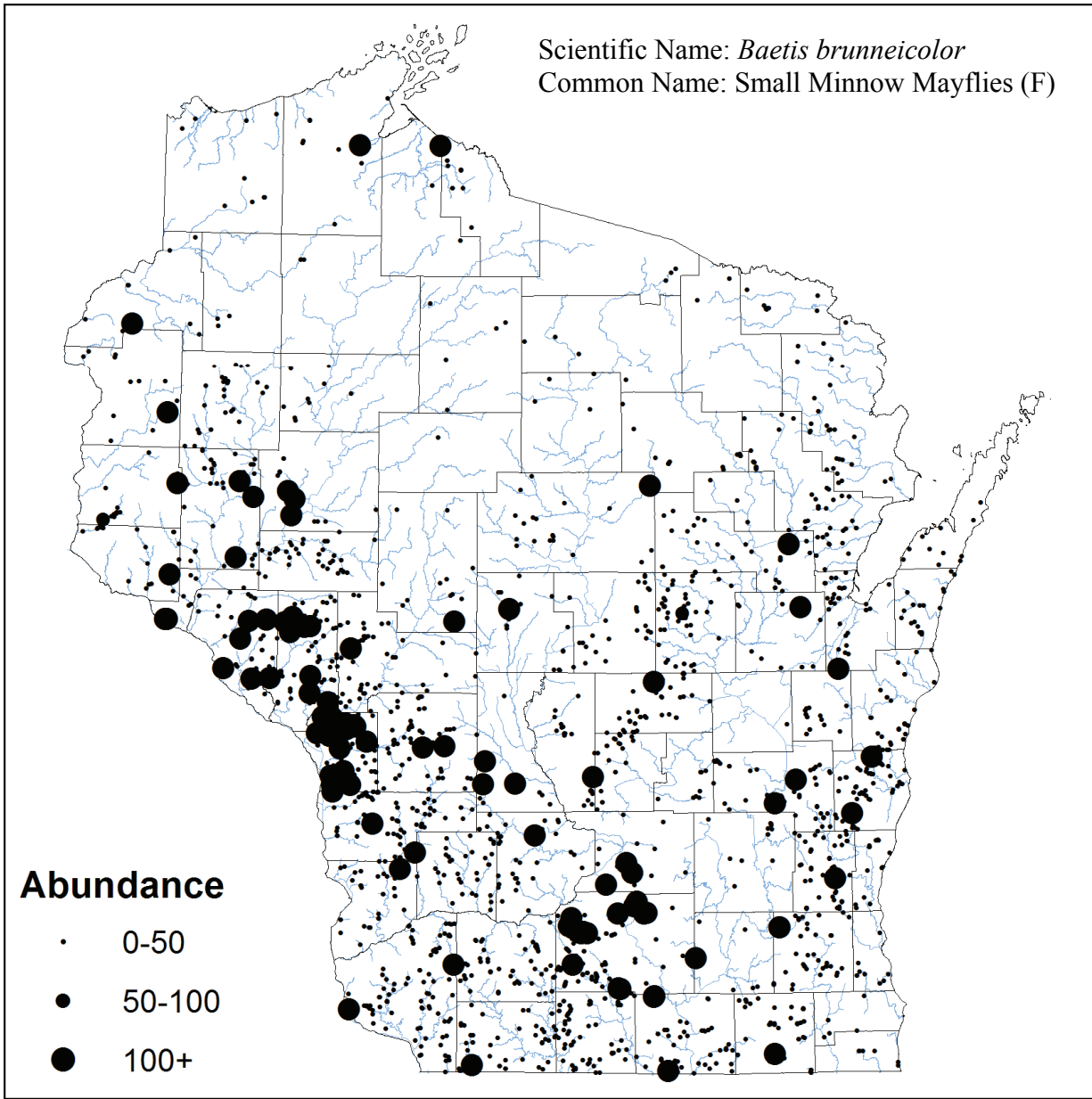
Scientific Name: *Acerpenna pygmaea*  
Common Name: Small Minnow Mayflies (F)



# Ephemeroptera Baetidae



# Ephemeroptera Baetidae

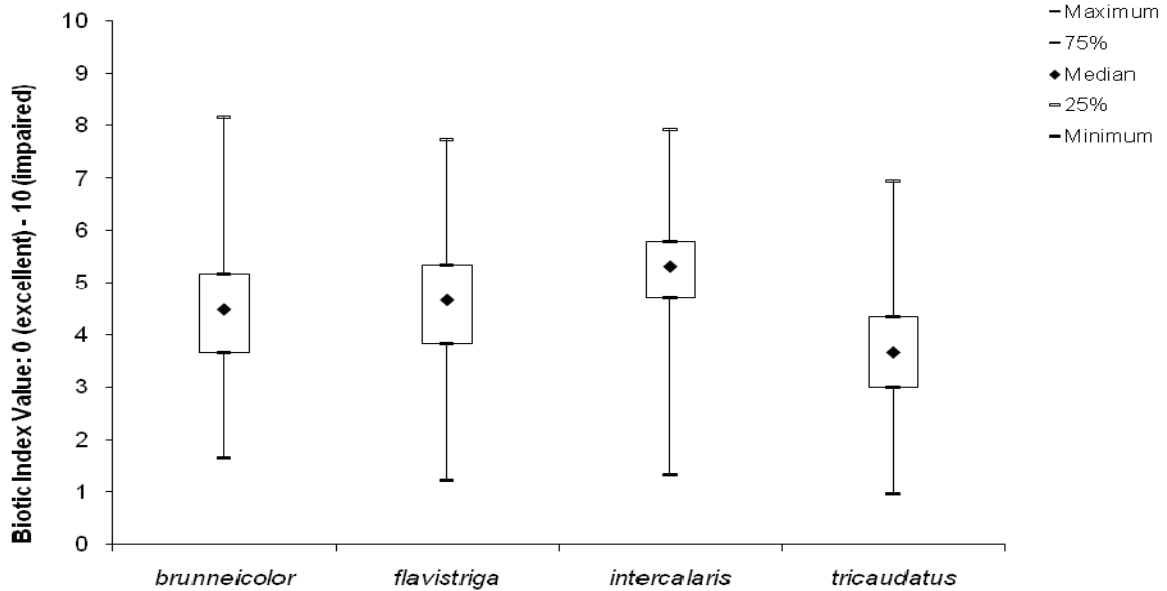
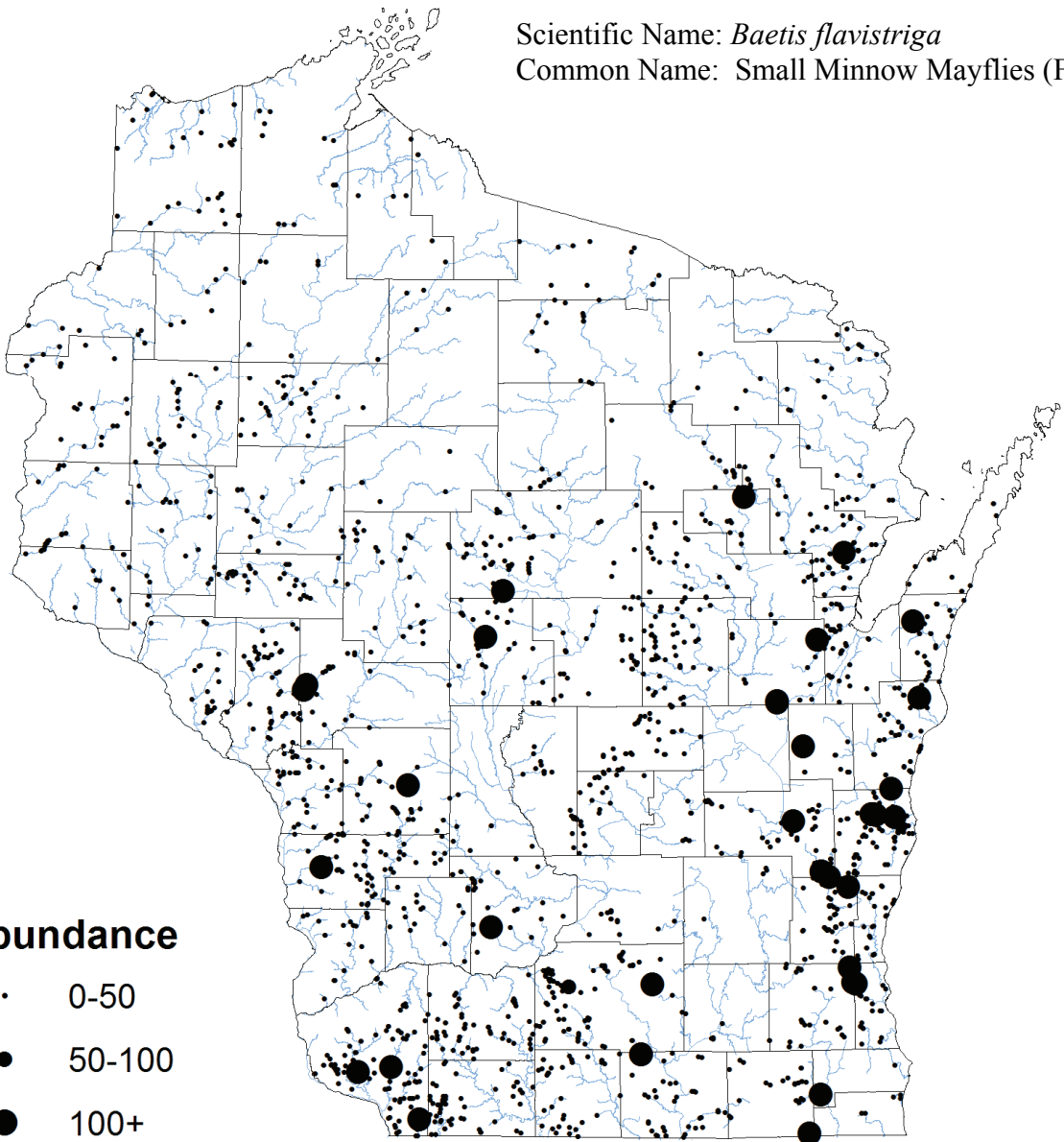


# Ephemeroptera Baetidae

Scientific Name: *Baetis flavistriga*  
 Common Name: Small Minnow Mayflies (F)

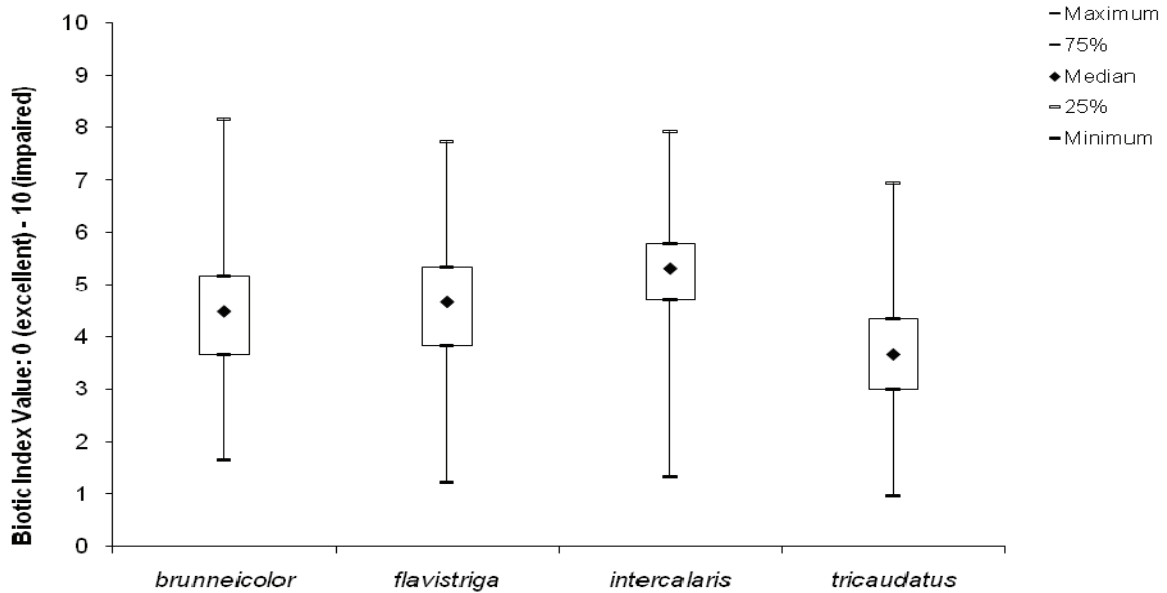
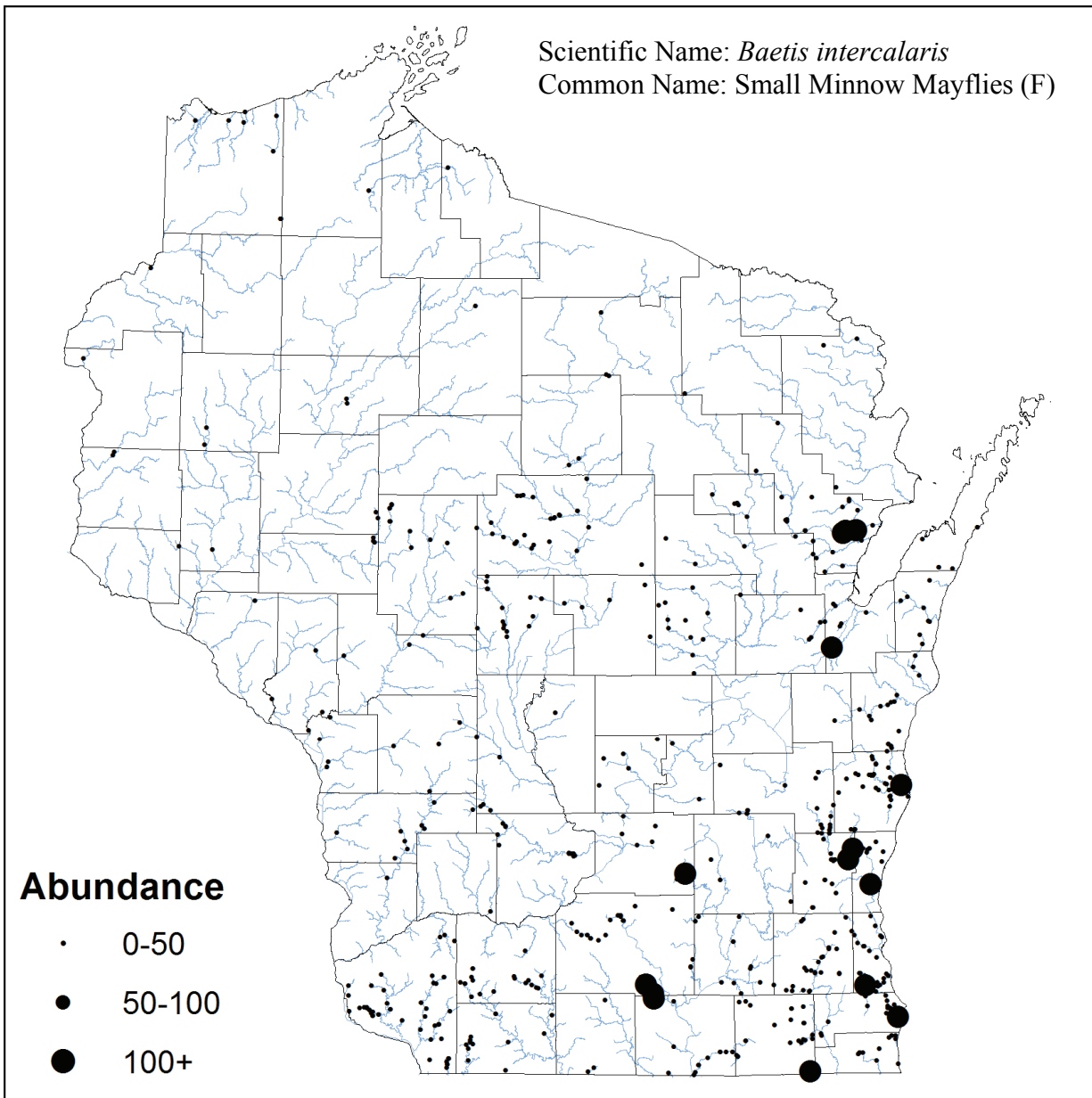
## Abundance

- 0-50
- 50-100
- 100+

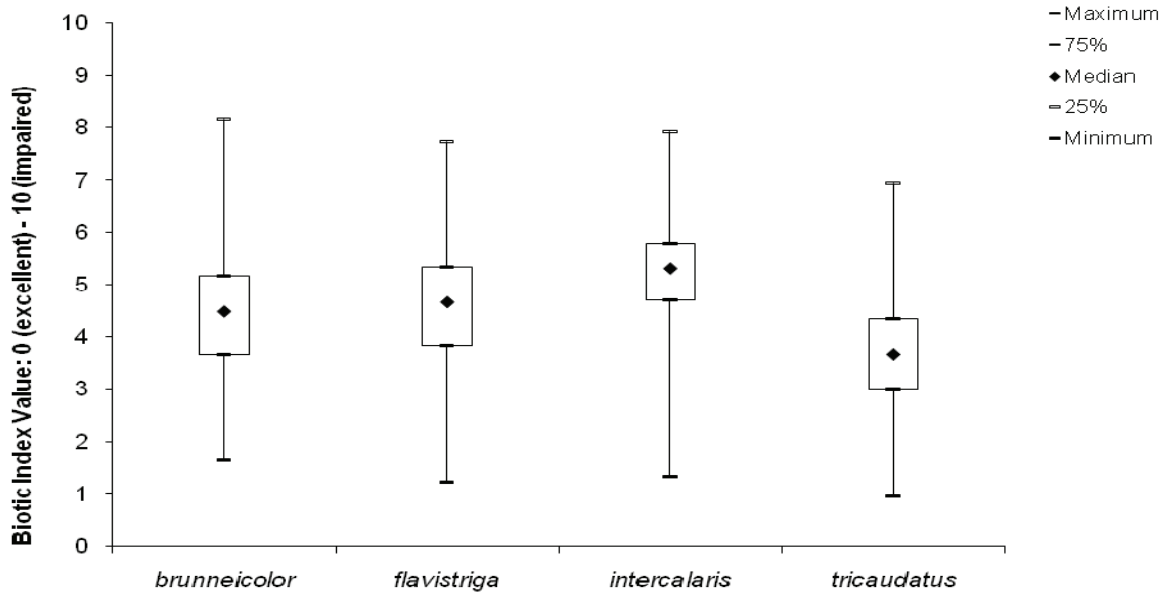
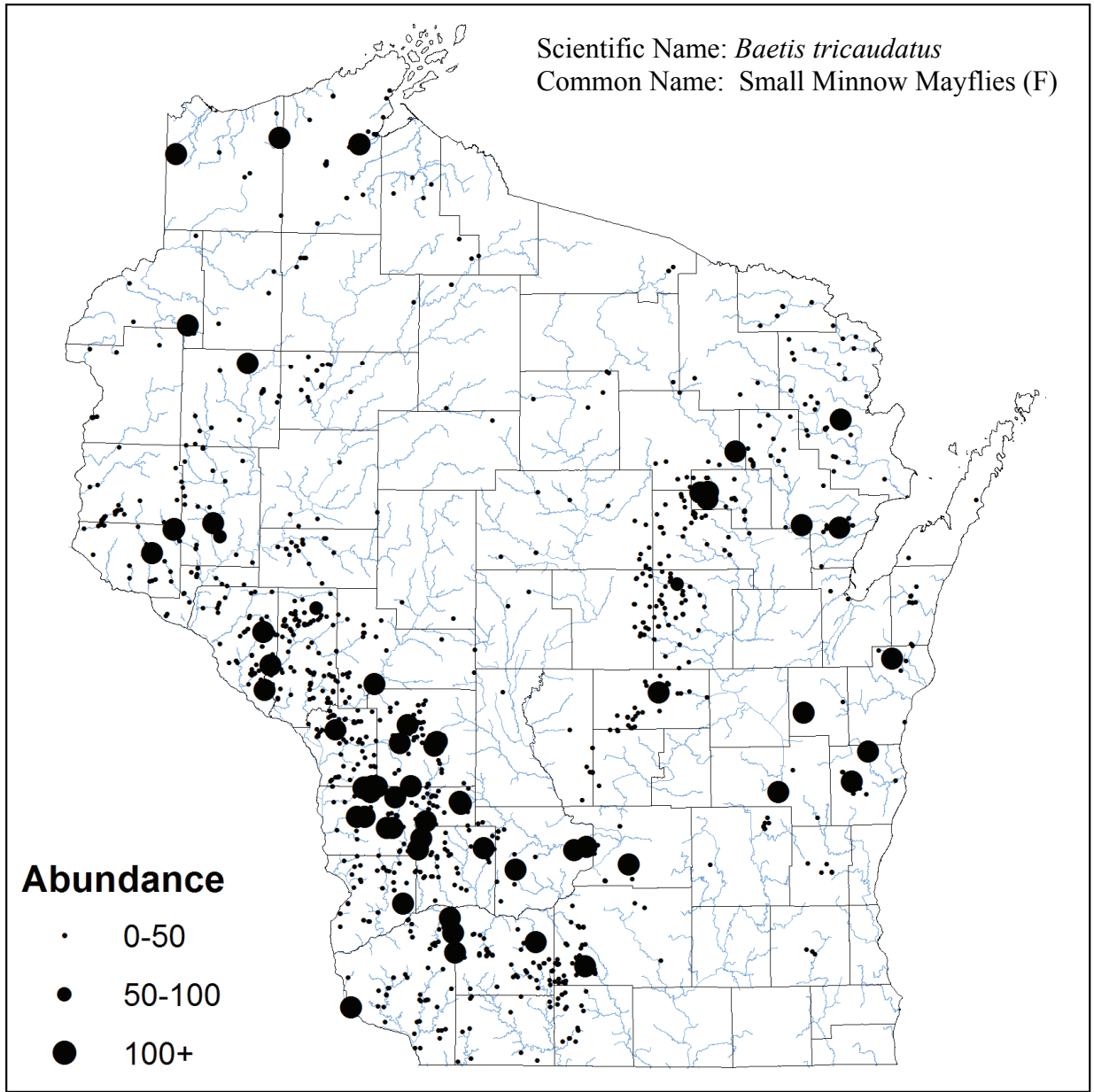


# Ephemeroptera Baetidae

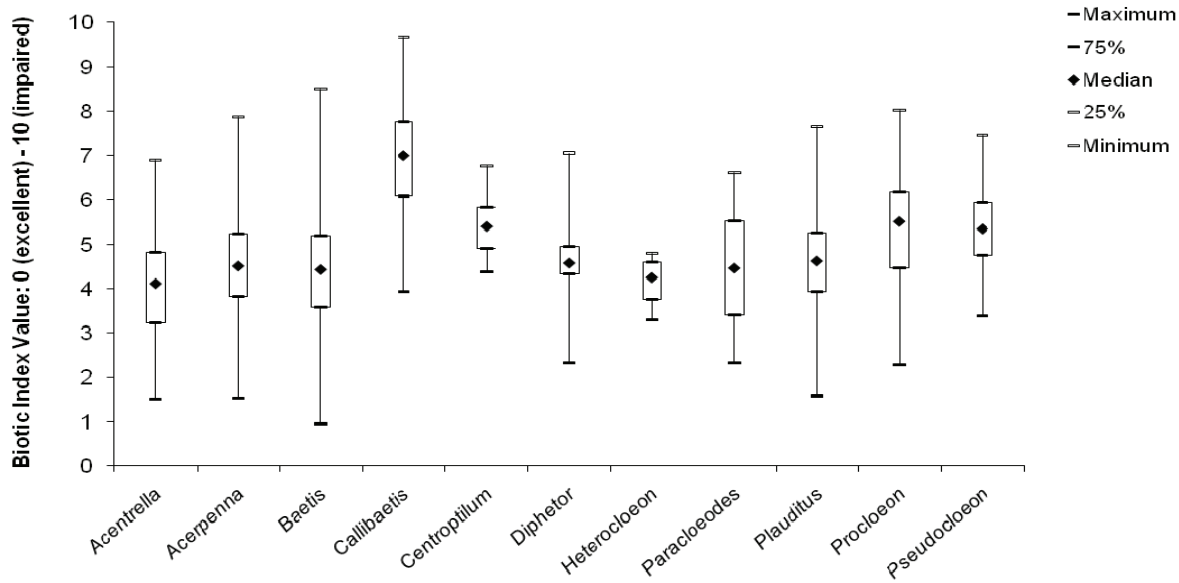
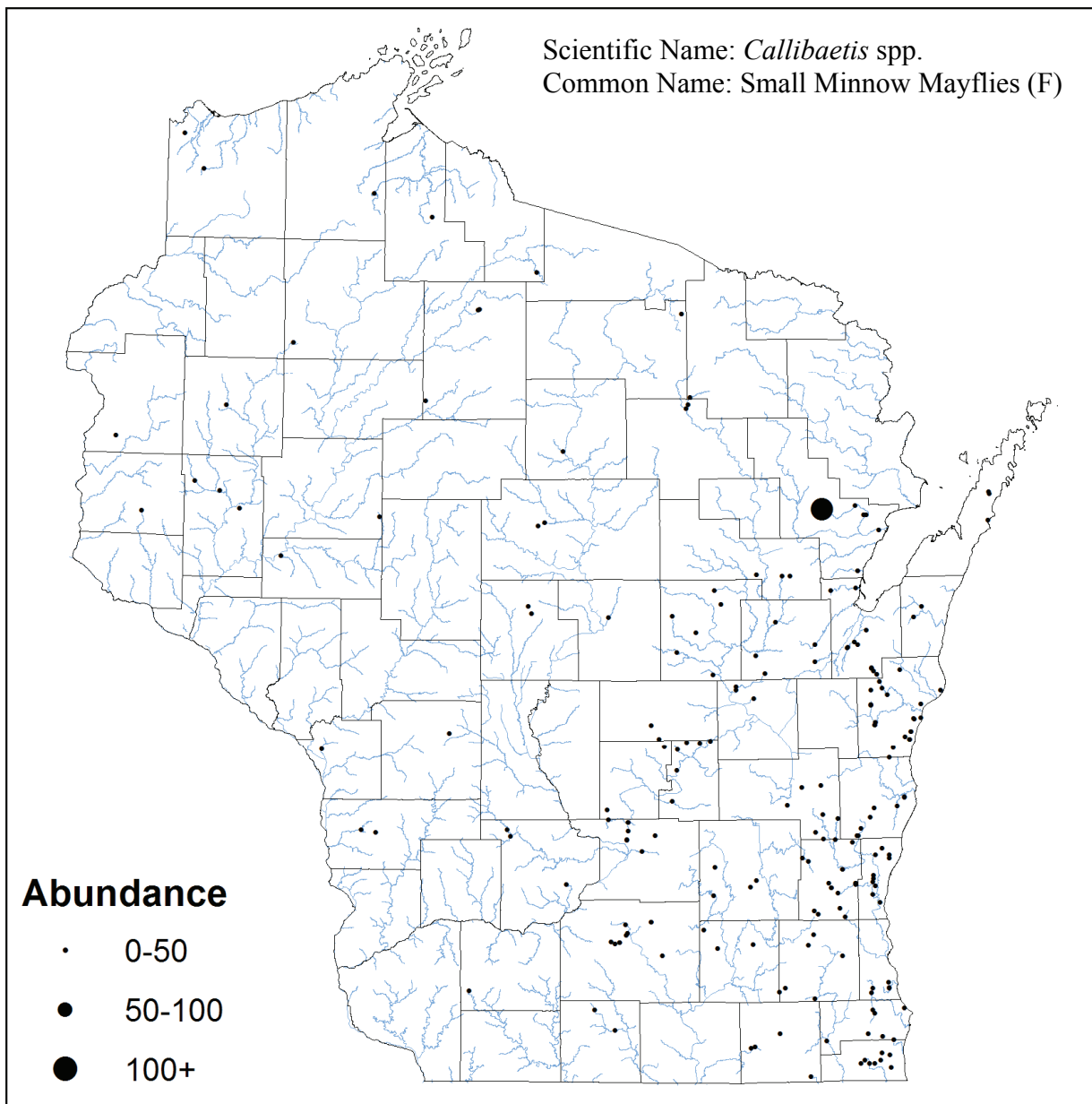
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 Common Name: Small Minnow Mayflies (F)



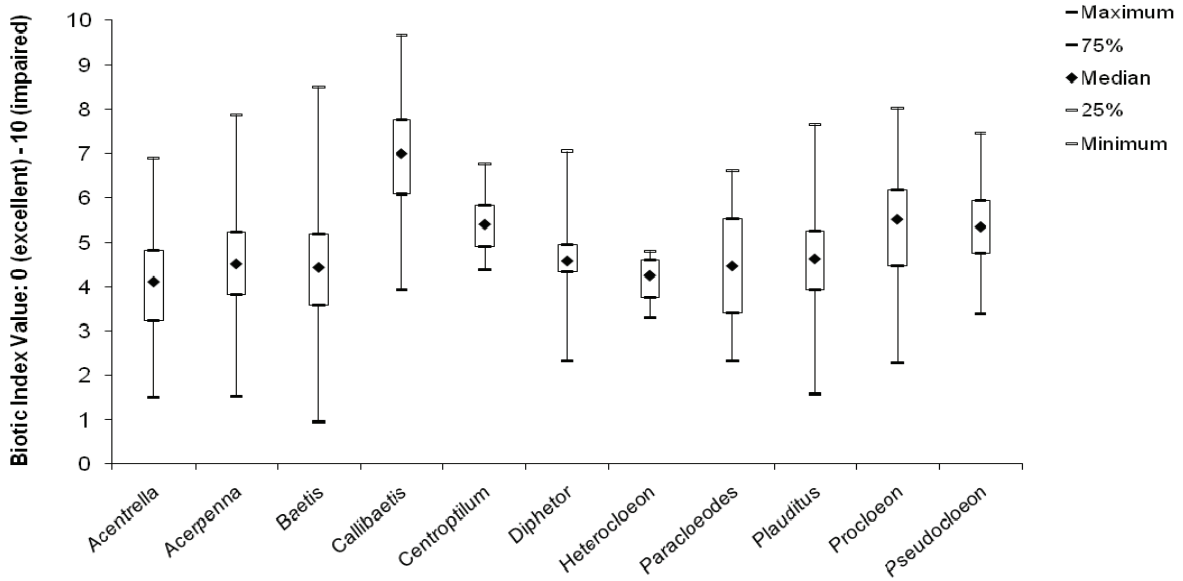
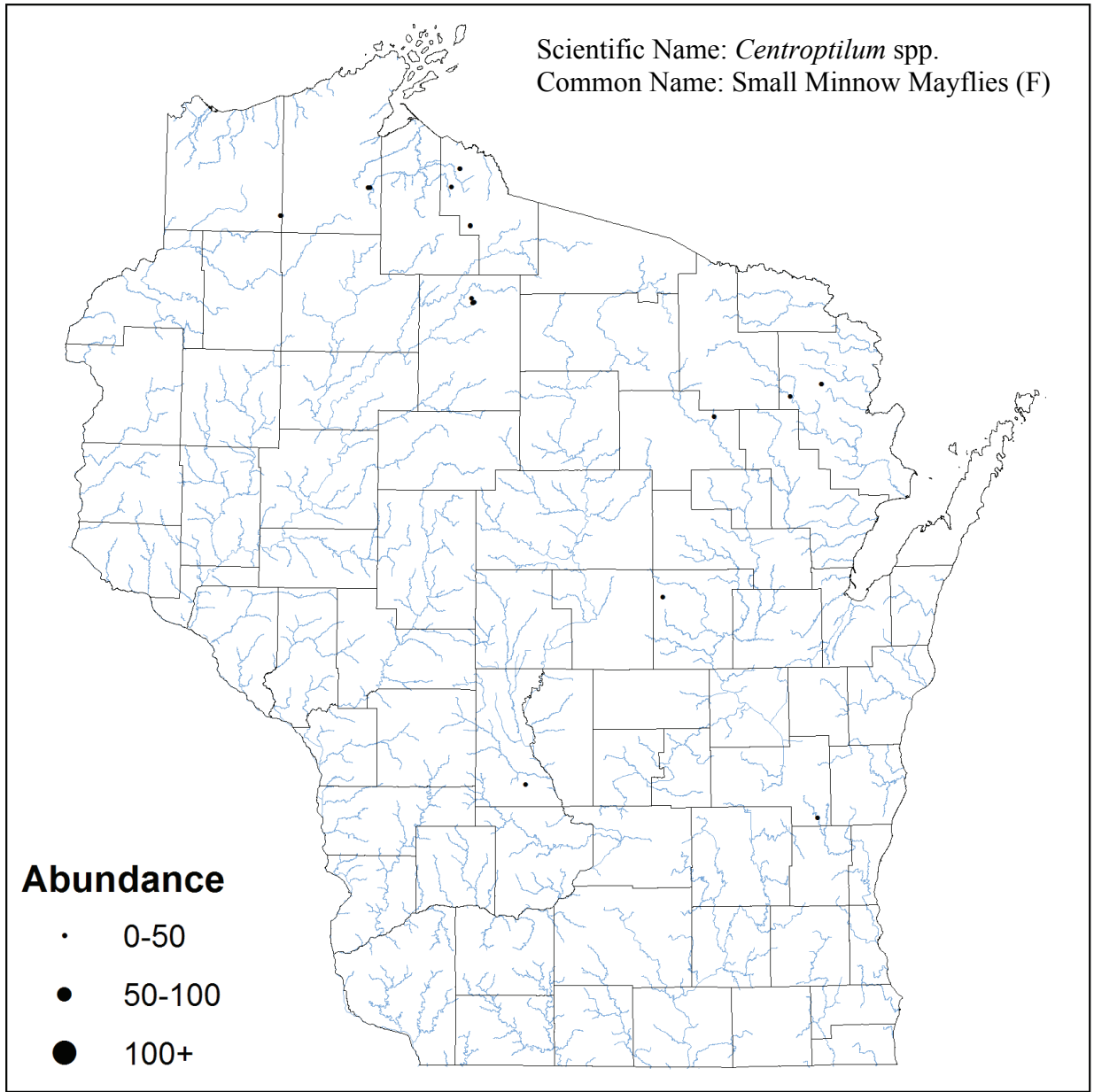
# Ephemeroptera Baetidae



# Ephemeroptera Baetidae

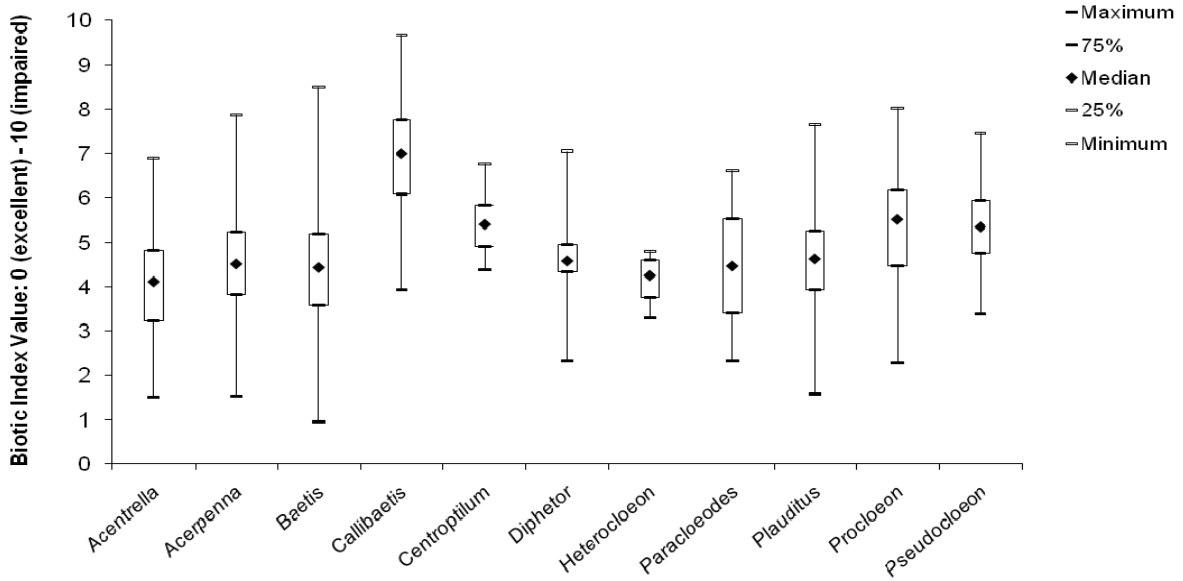
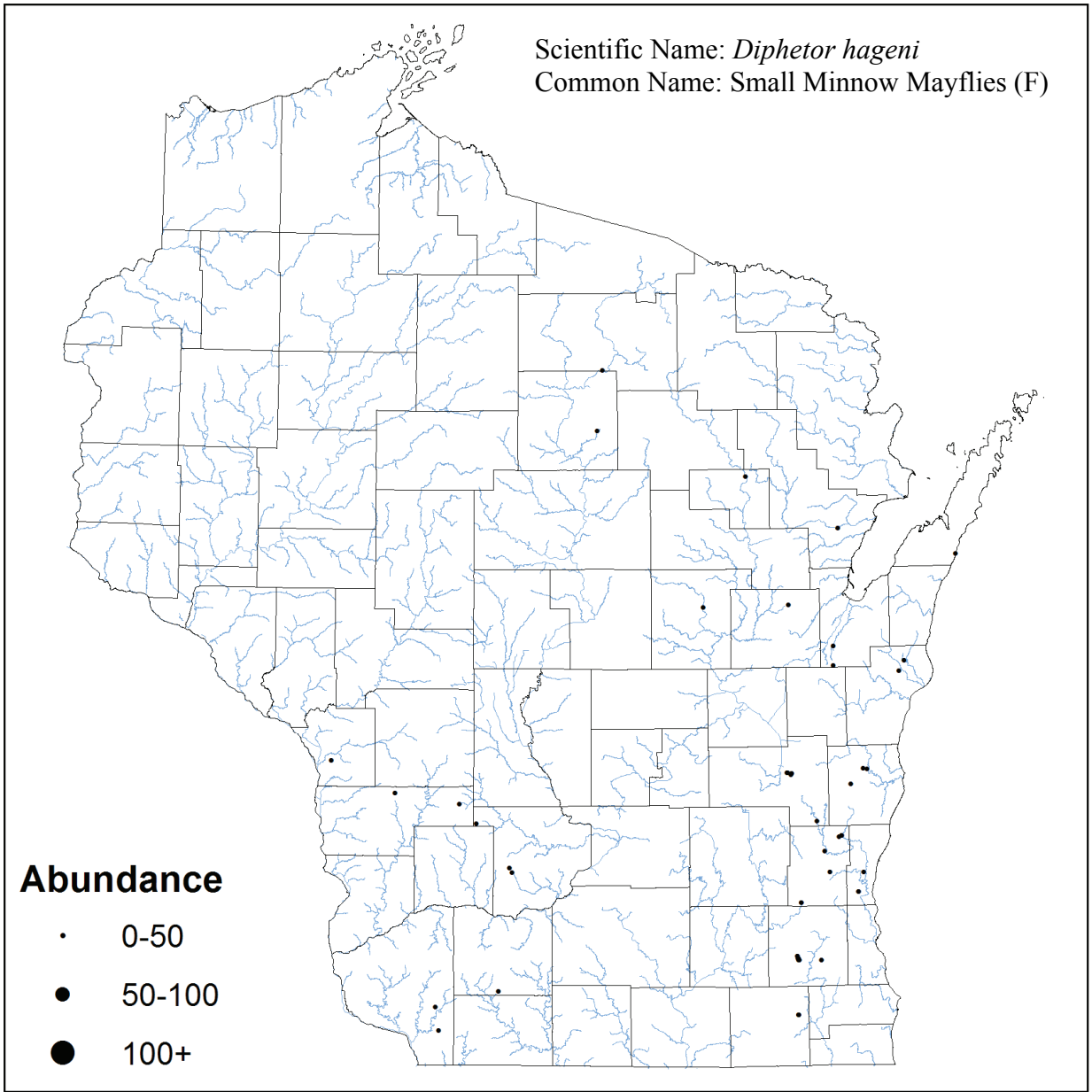


# Ephemeroptera Baetidae

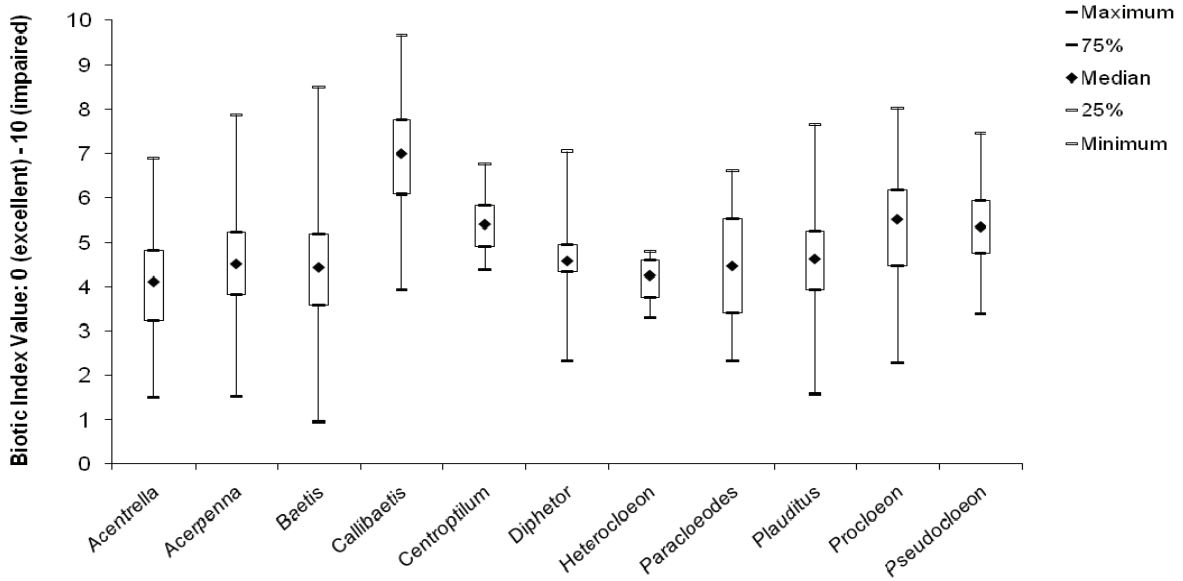
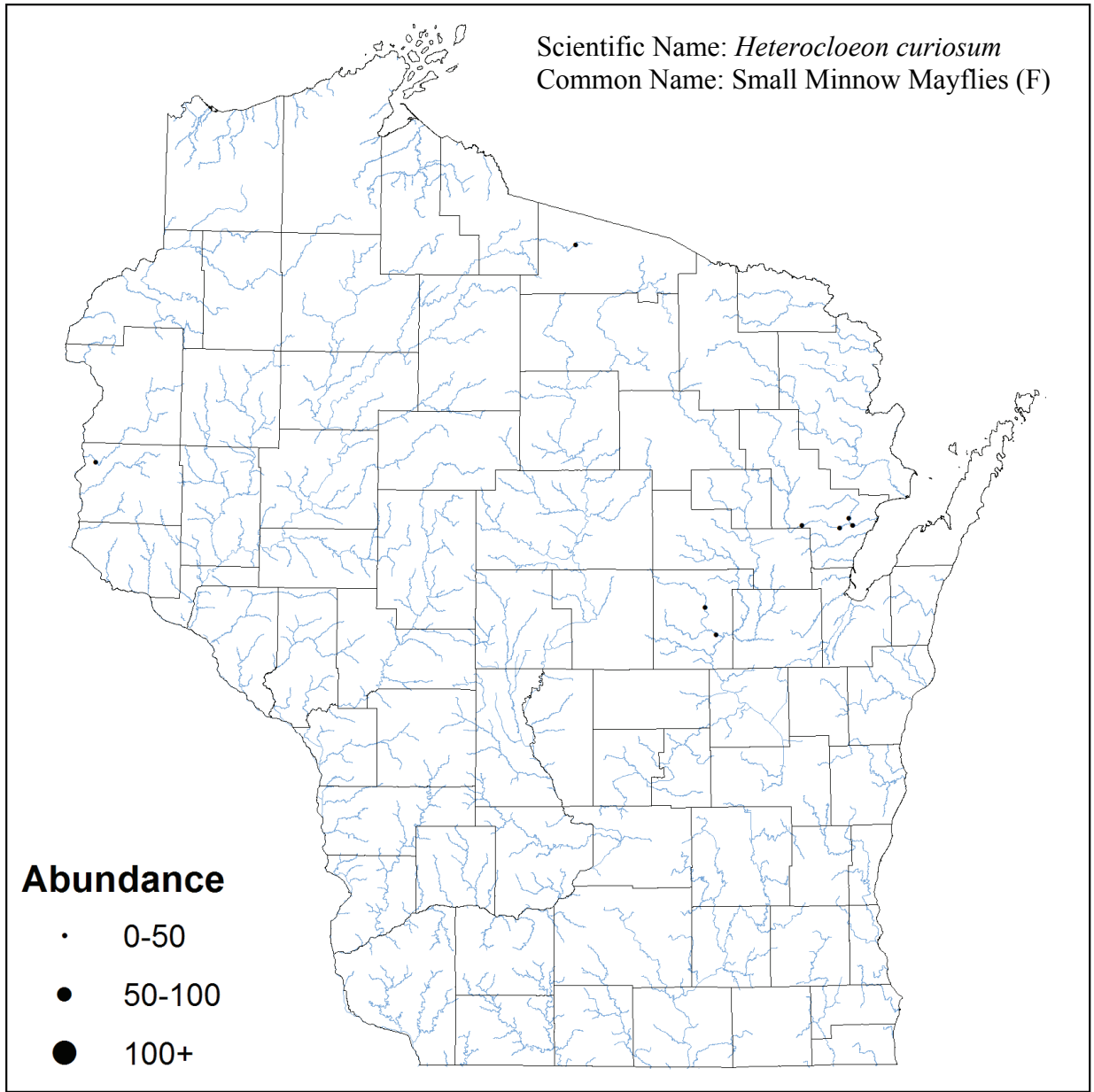




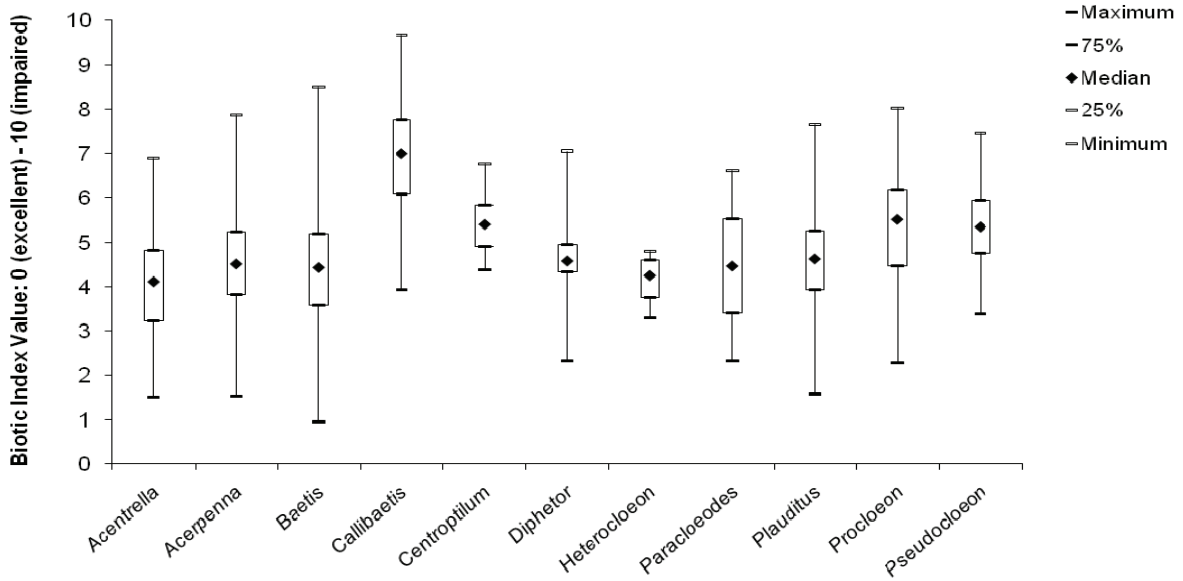
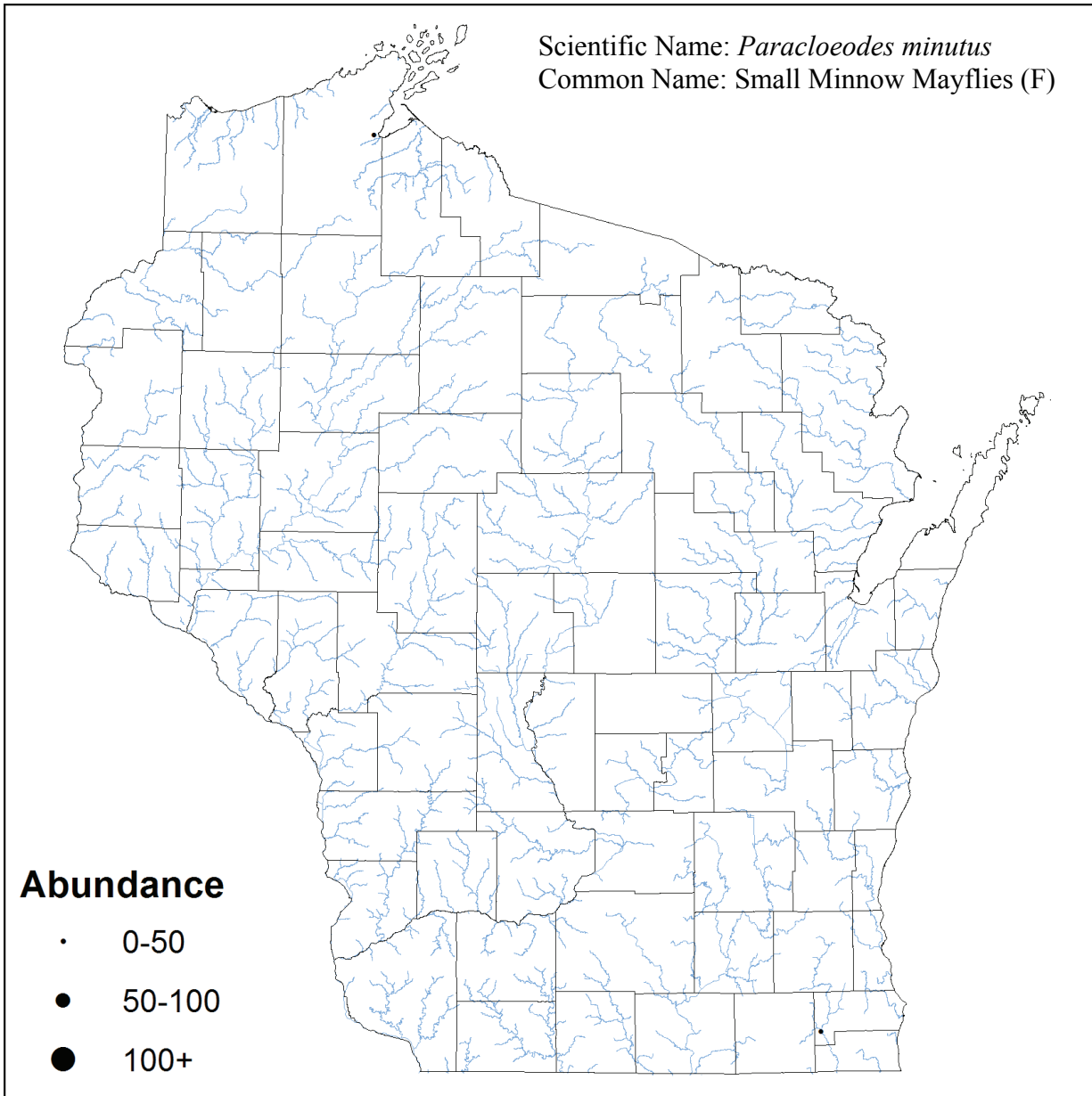
# Ephemeroptera Baetidae



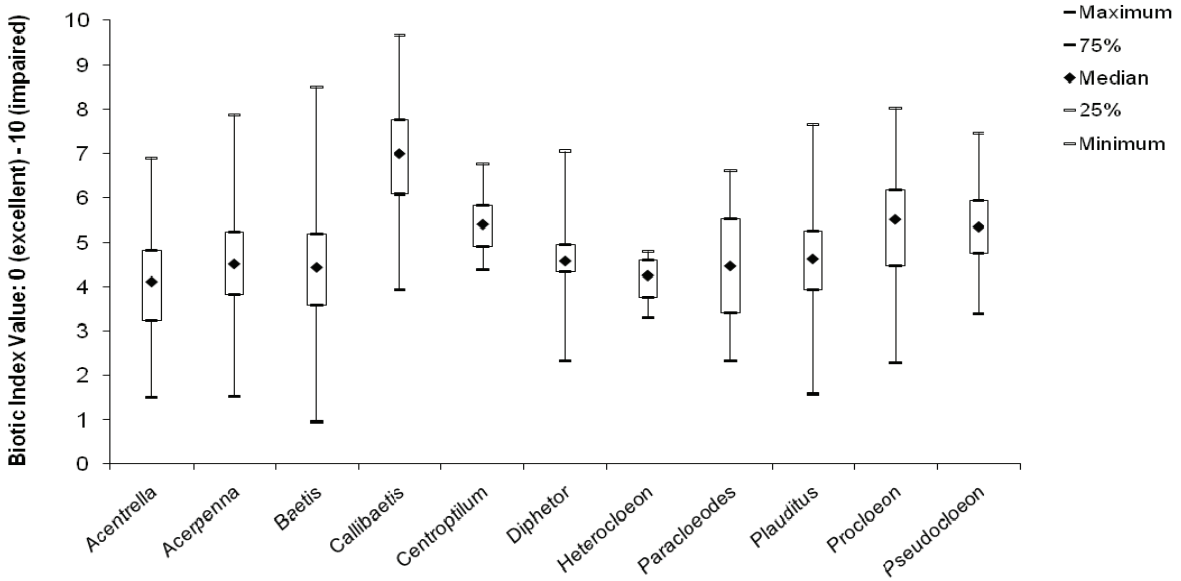
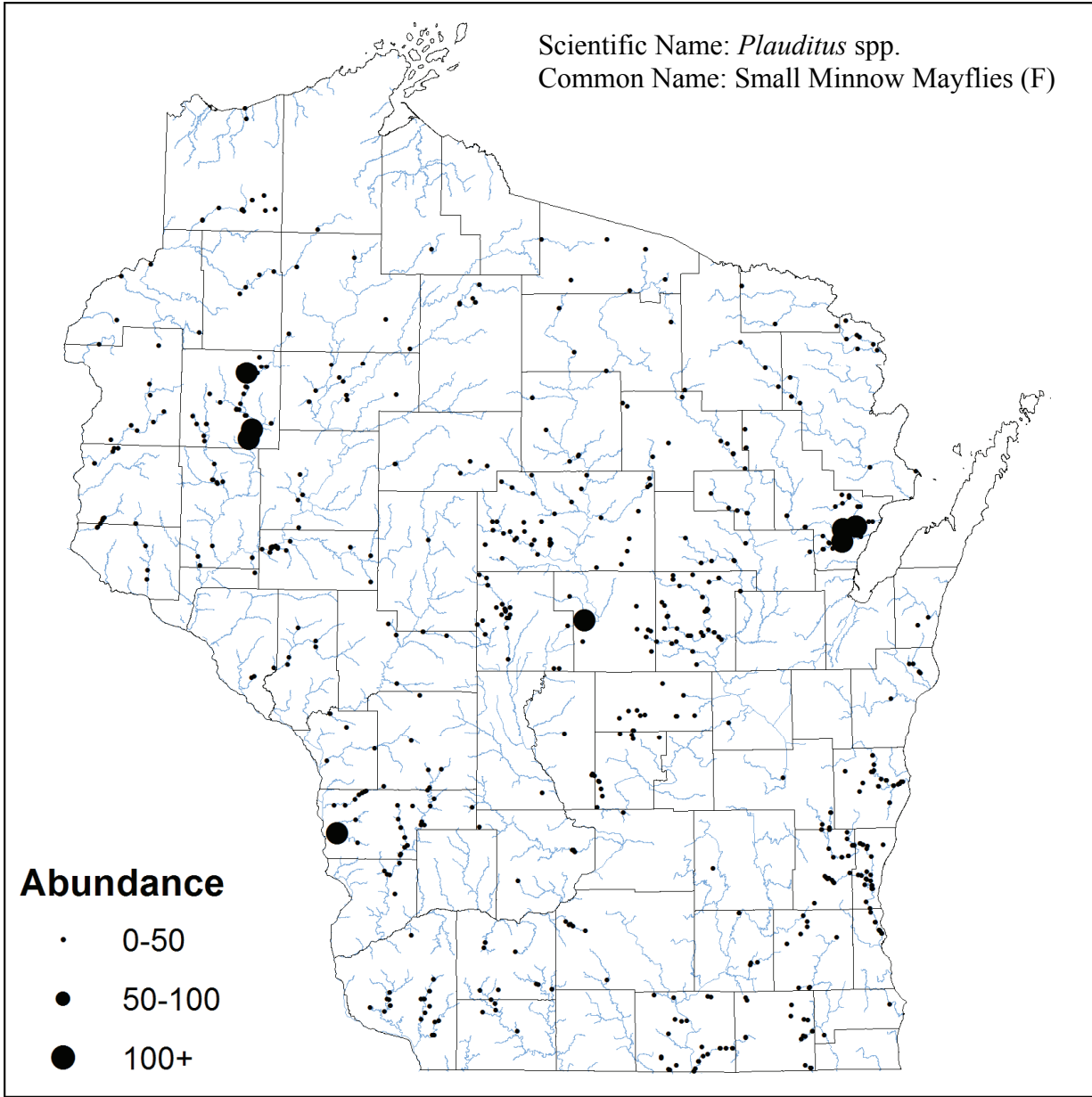
# Ephemeroptera Baetidae



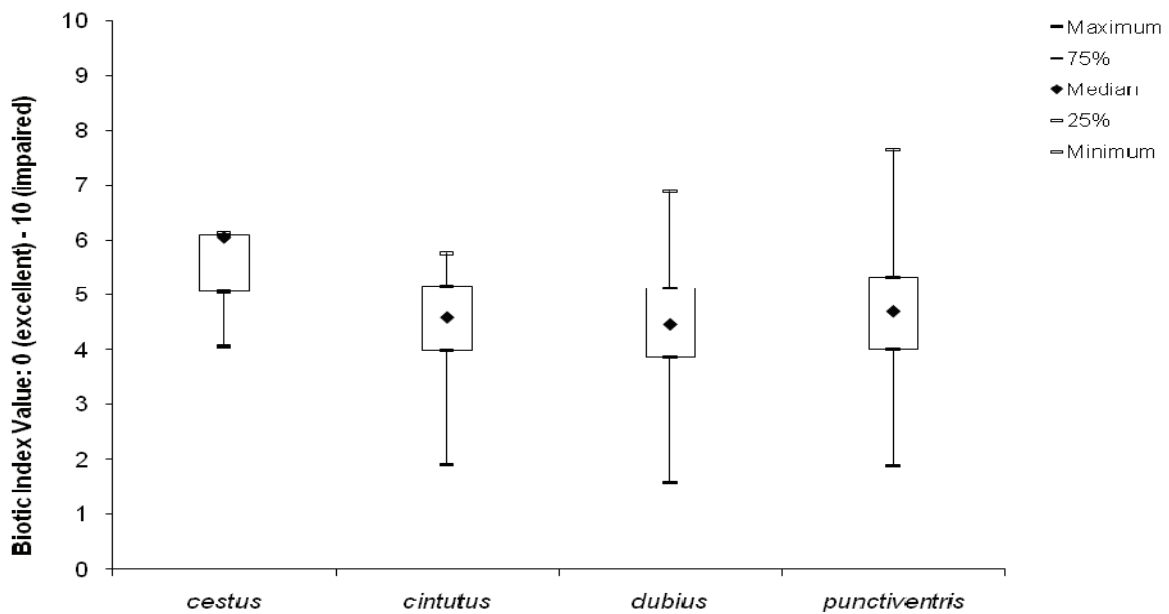
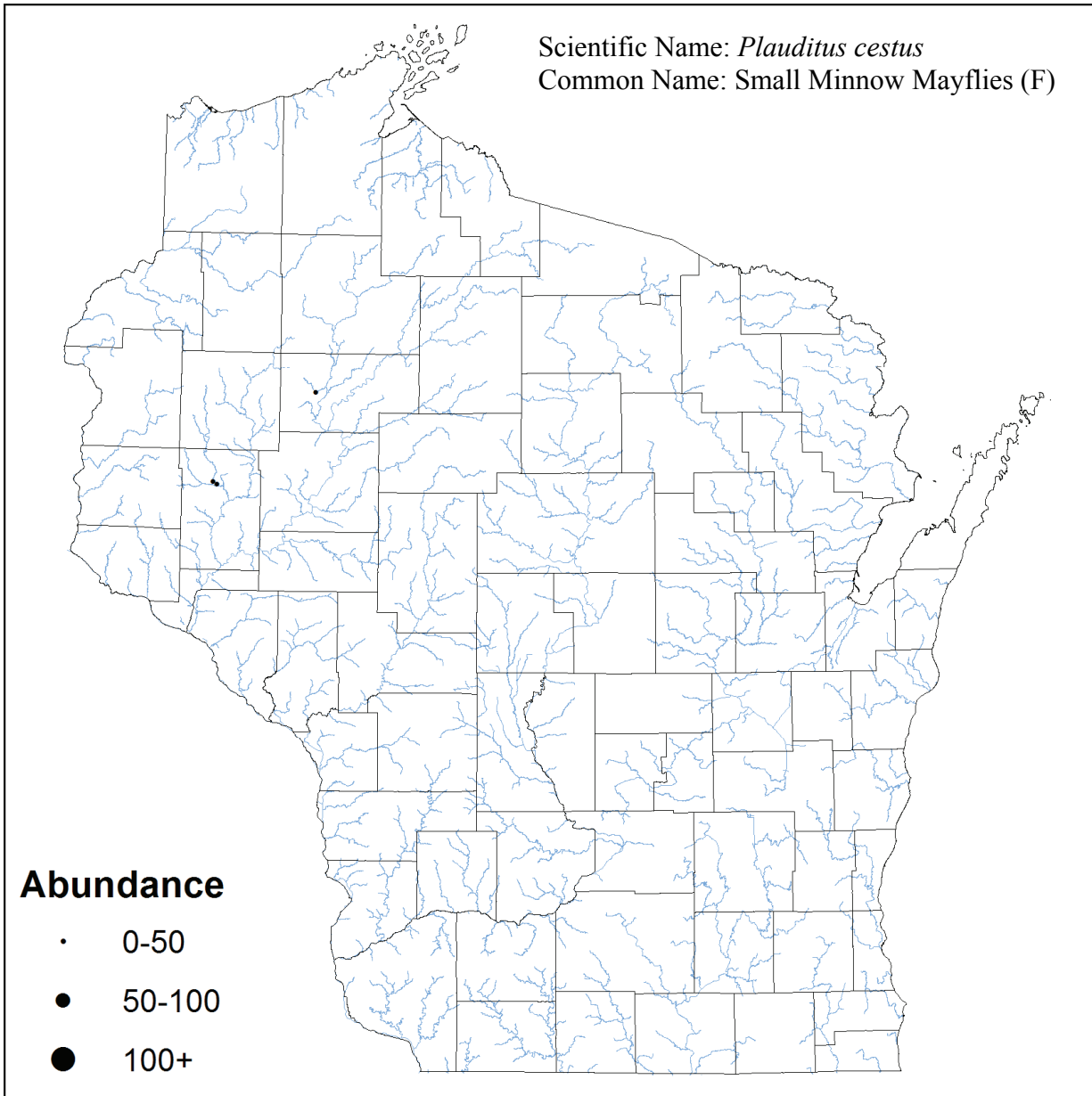
# Ephemeroptera Baetidae



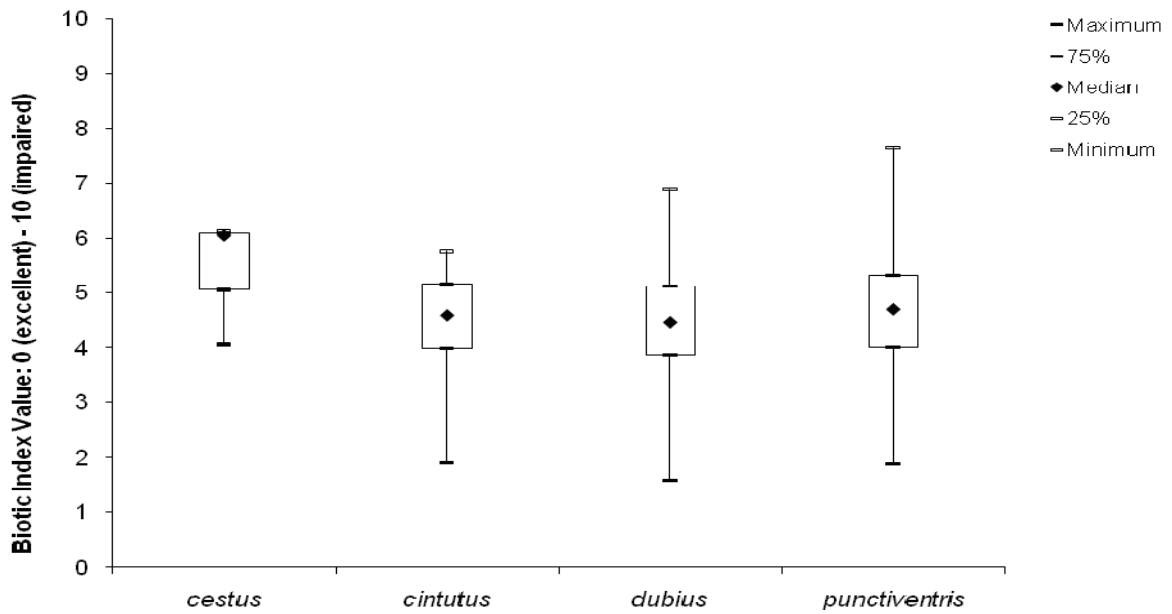
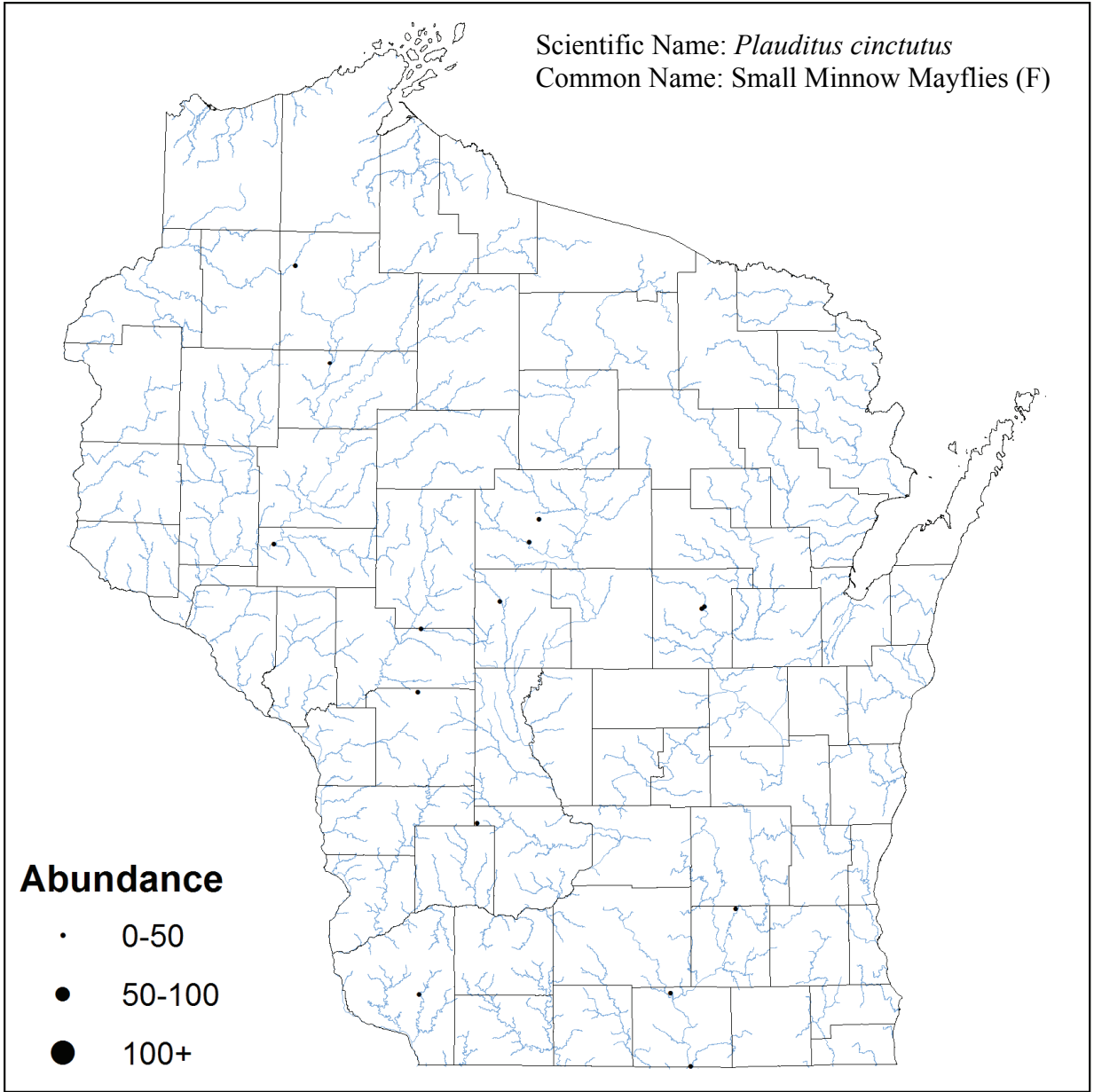
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# Ephemeroptera Baetidae

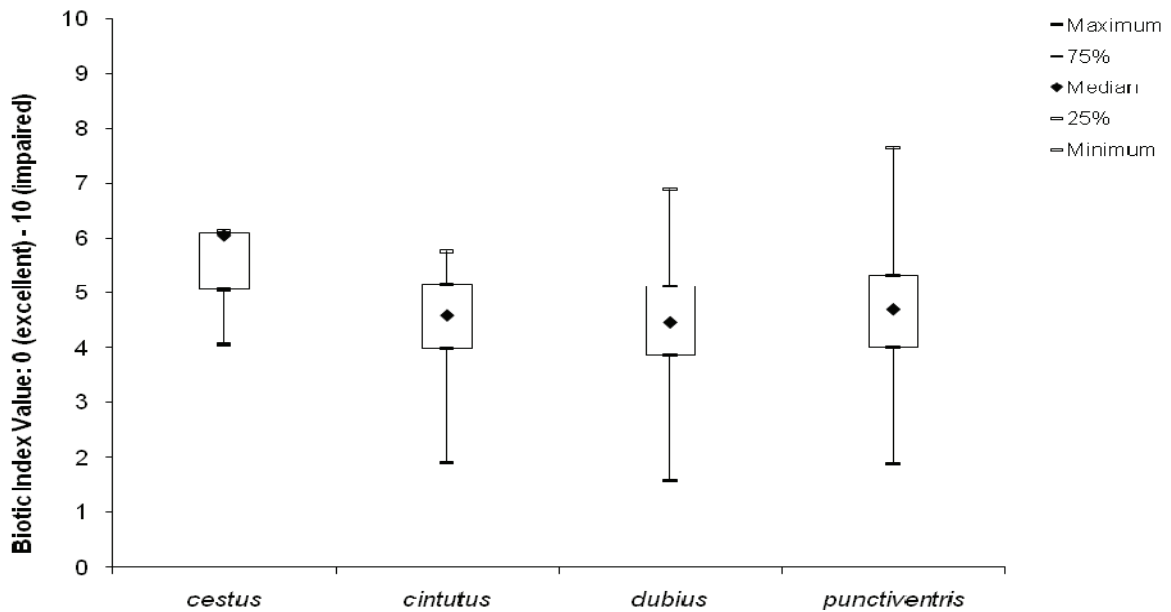
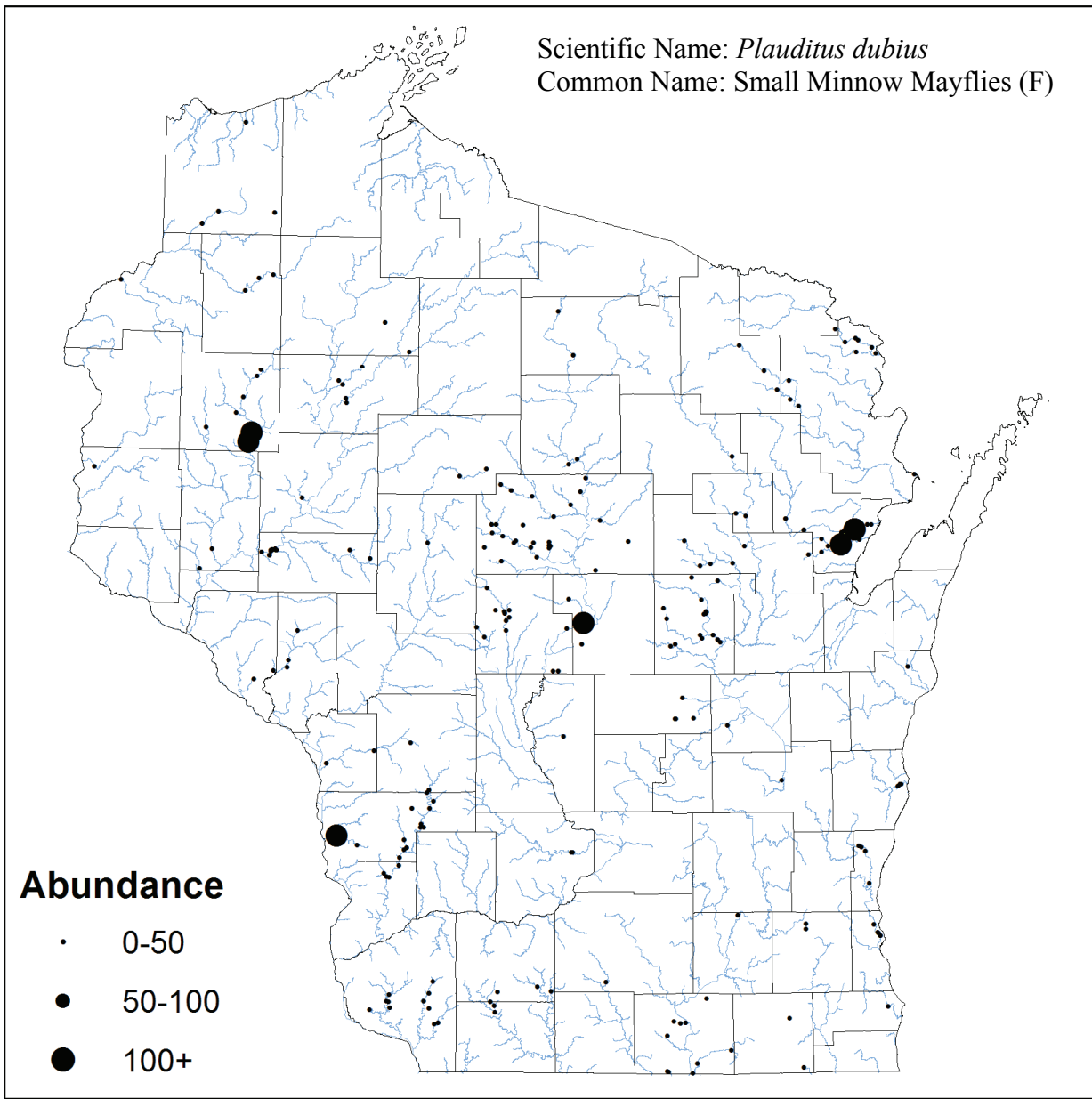


# Ephemeroptera Baetidae



# Ephemeroptera Baetidae

Scientific Name: *Plautidius dubius*  
 Common Name: Small Minnow Mayflies (F)

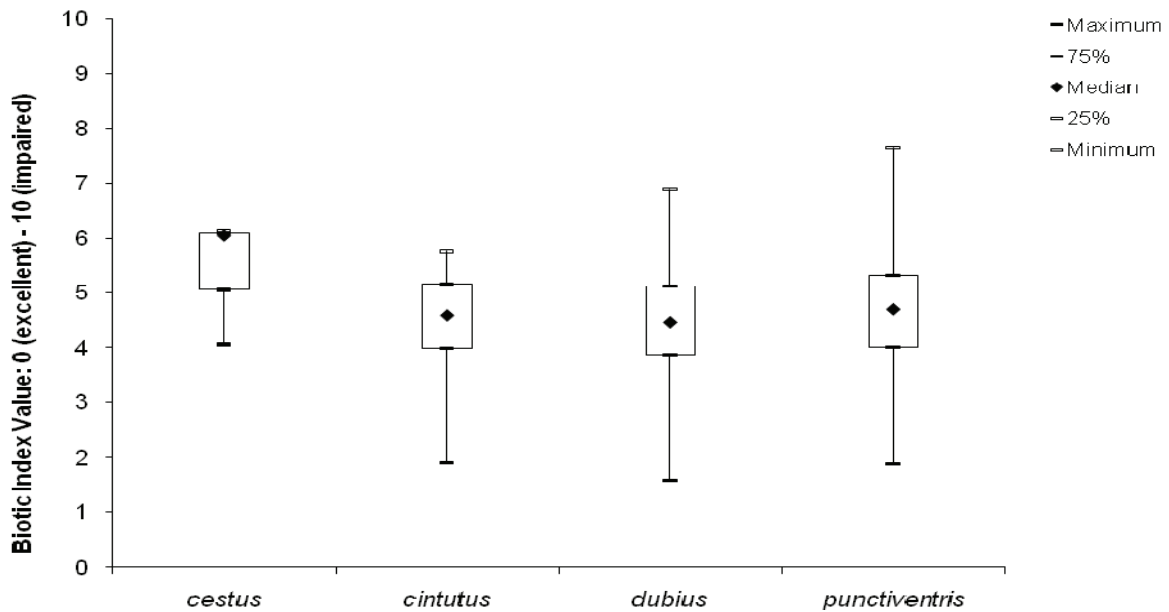
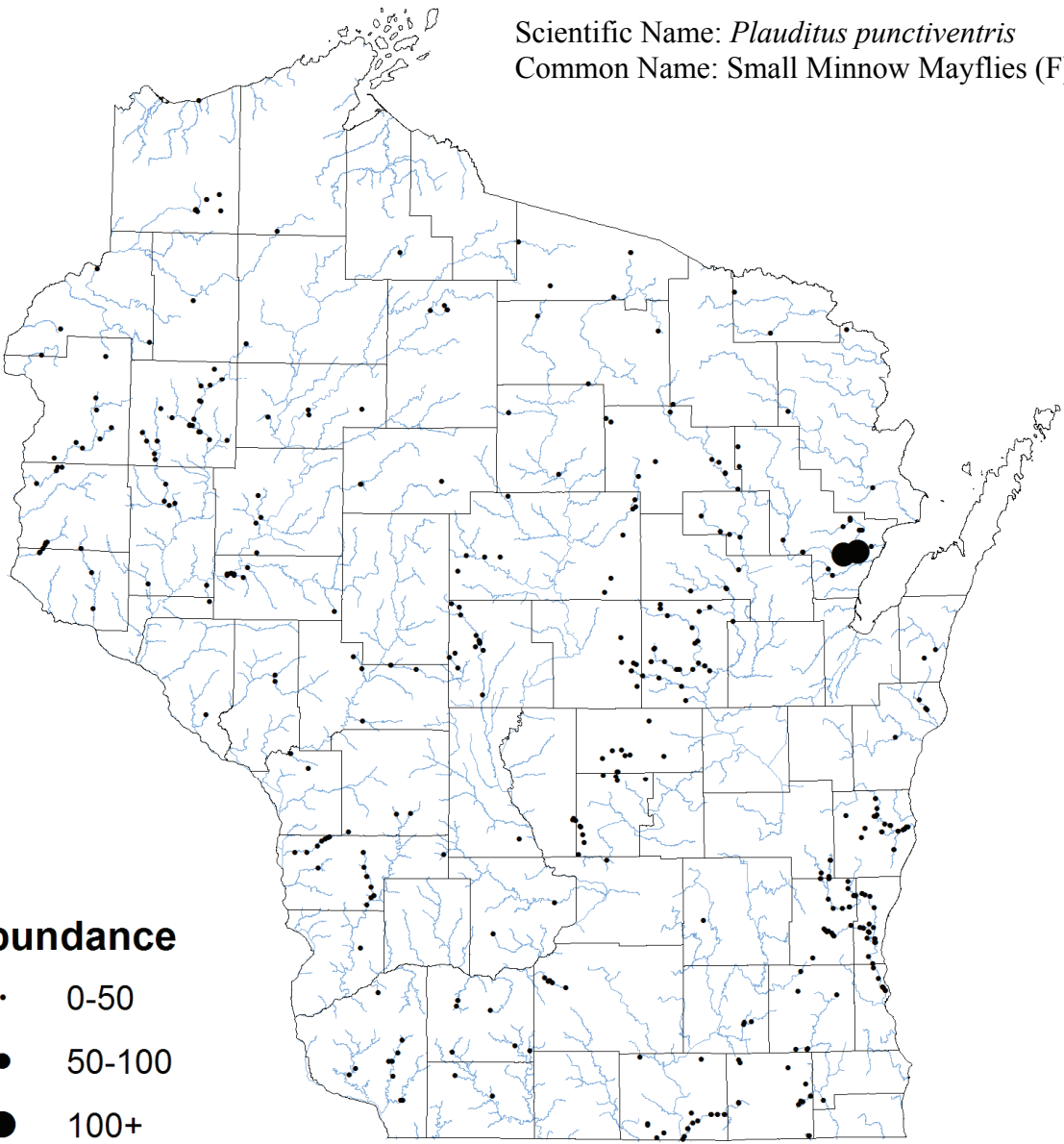


# Ephemeroptera Baetidae

Scientific Name: *Plautius punctiventris*  
 Common Name: Small Minnow Mayflies (F)

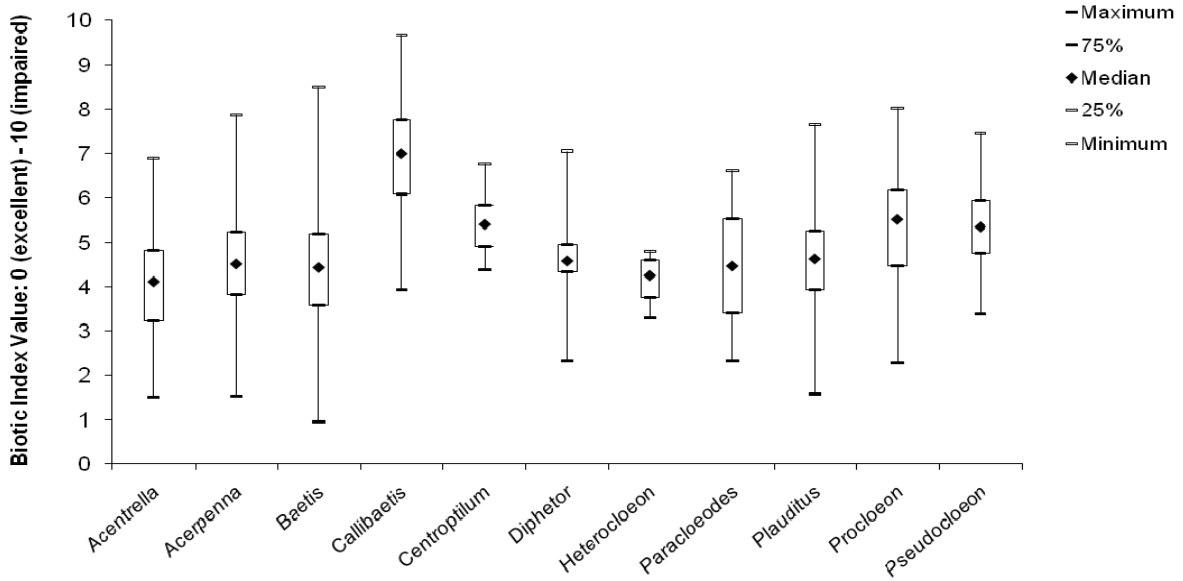
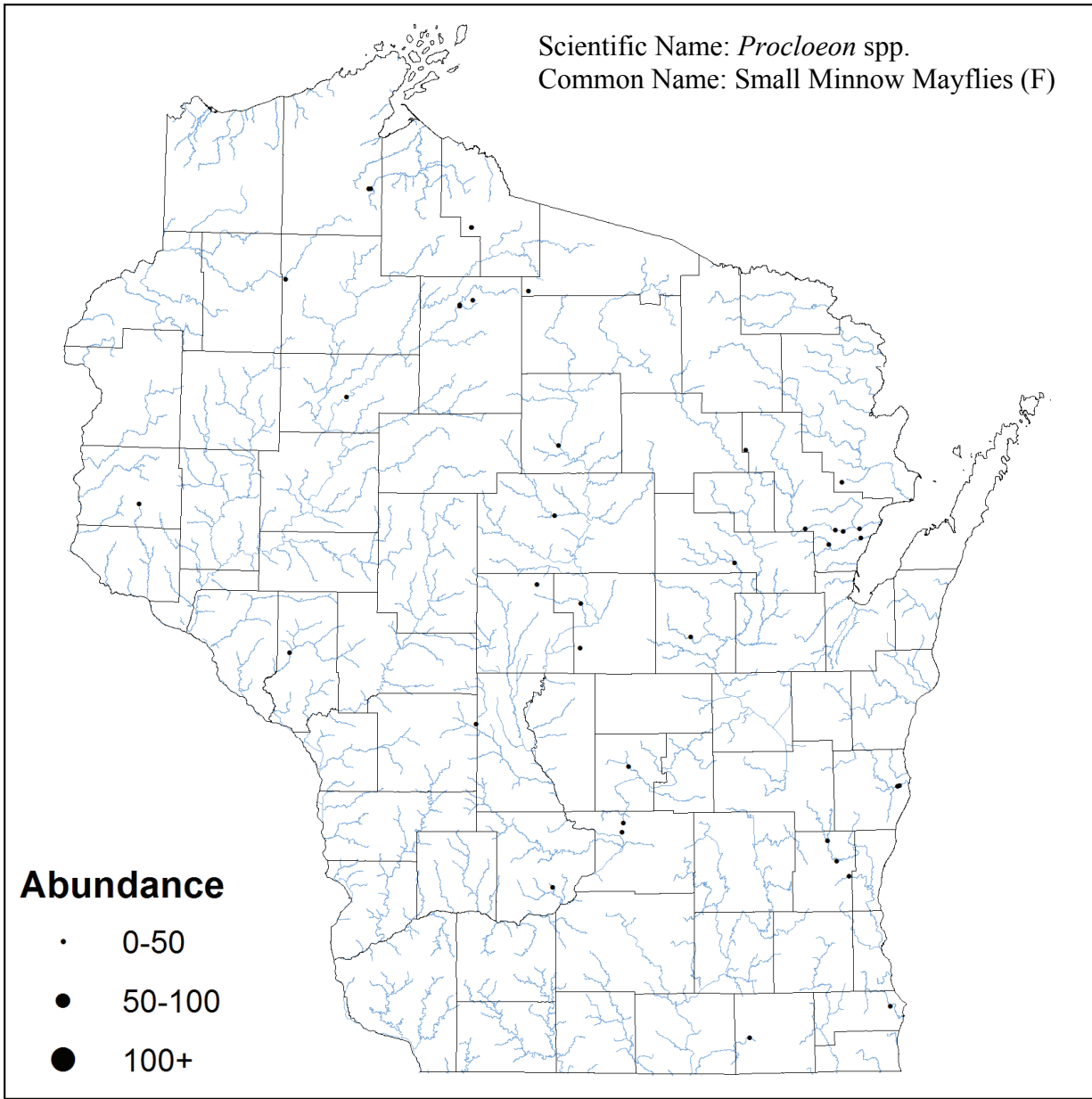
## Abundance

- 0-50
- 50-100
- 100+

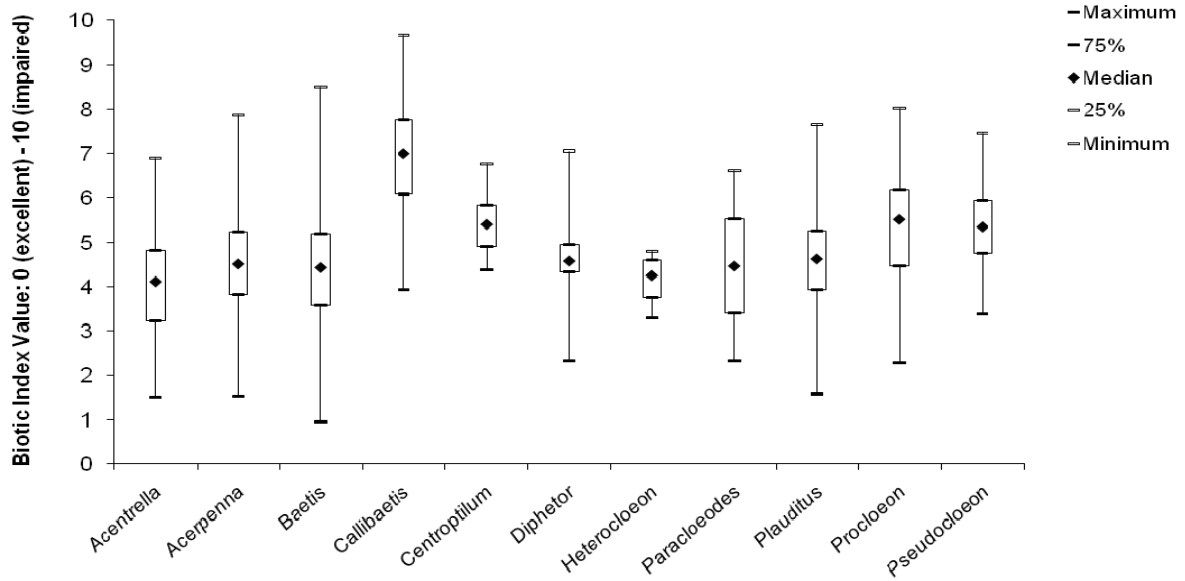
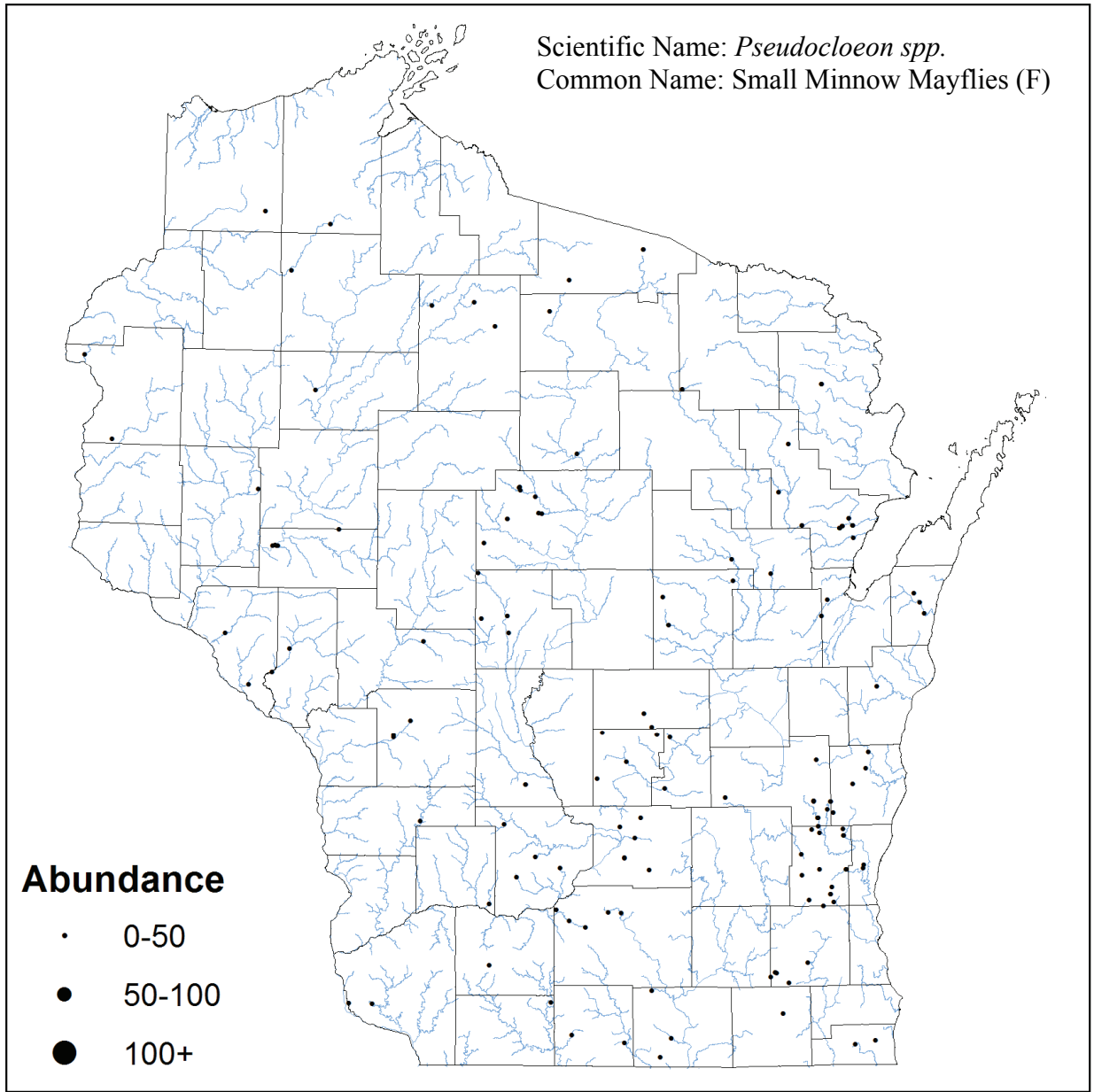




# Ephemeroptera Baetidae

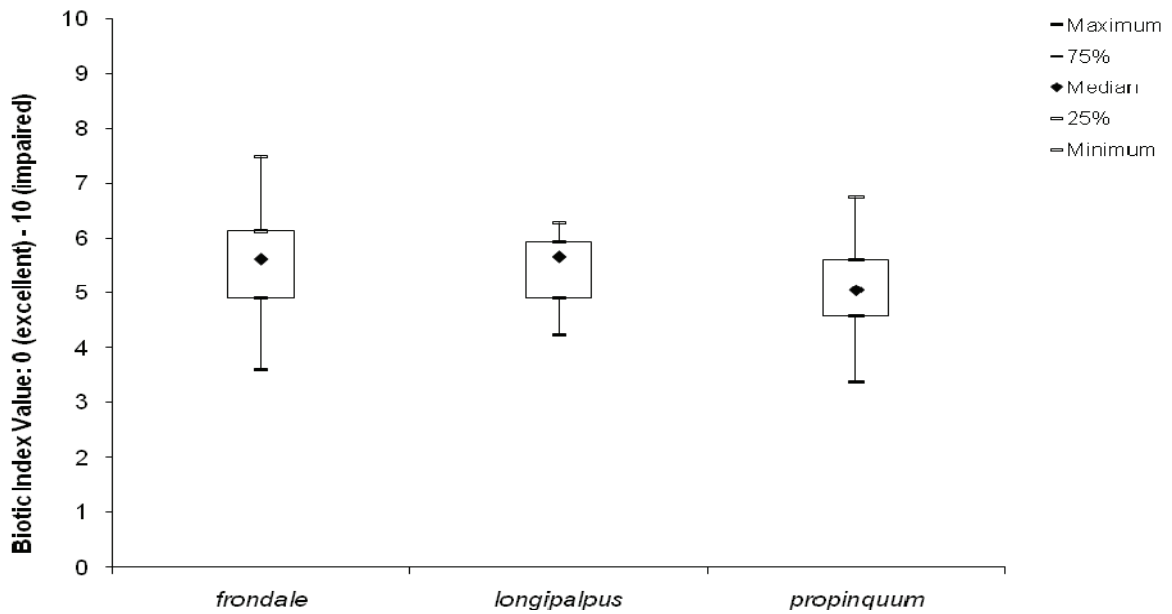
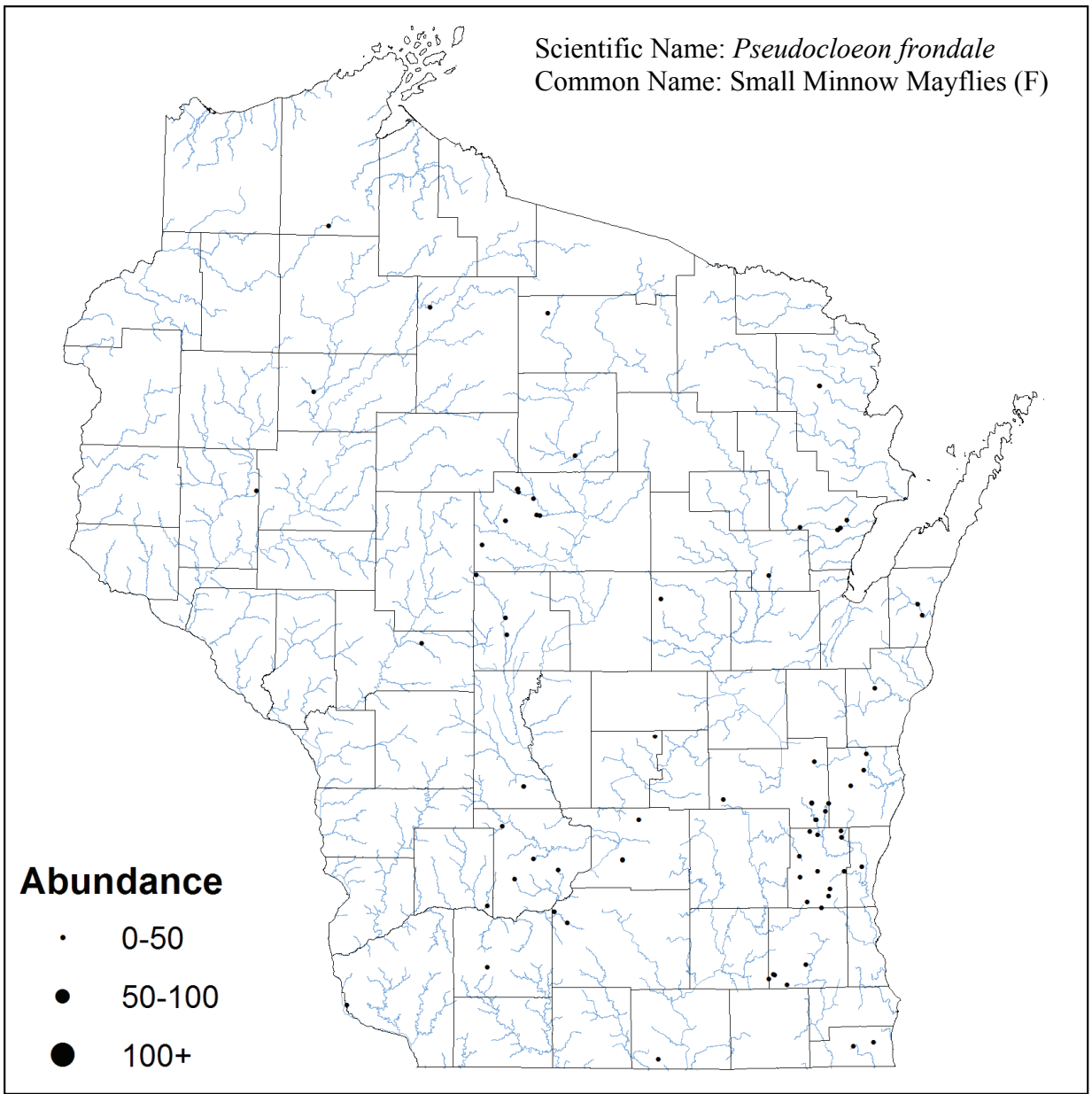


# Ephemeroptera Baetidae



# Ephemeroptera Baetidae

Scientific Name: *Pseudocloeon frondale*  
 Common Name: Small Minnow Mayflies (F)

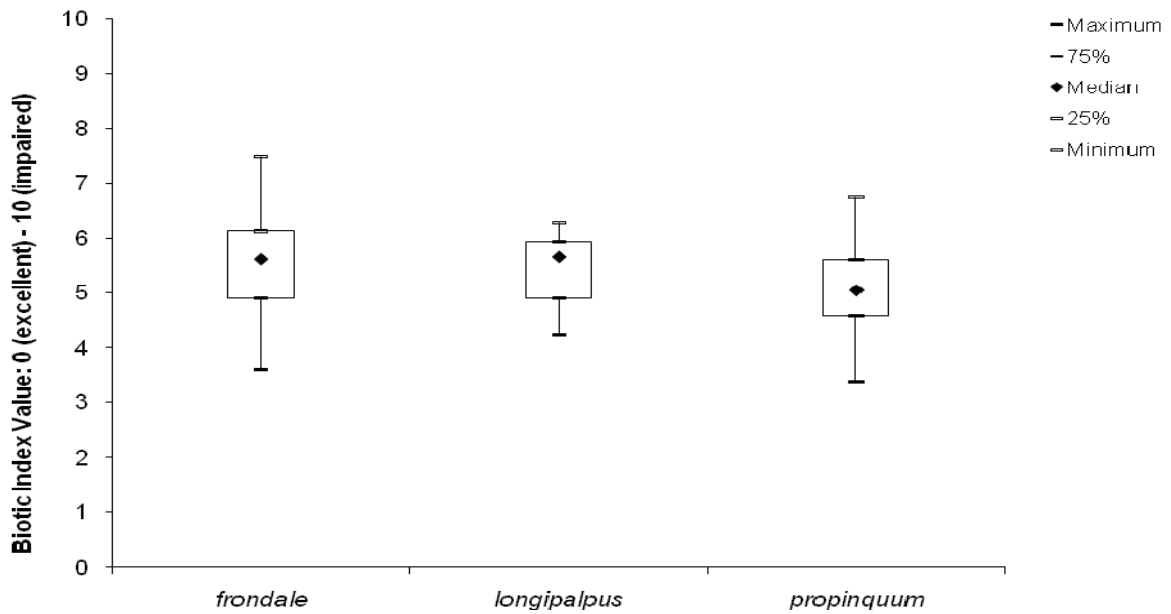
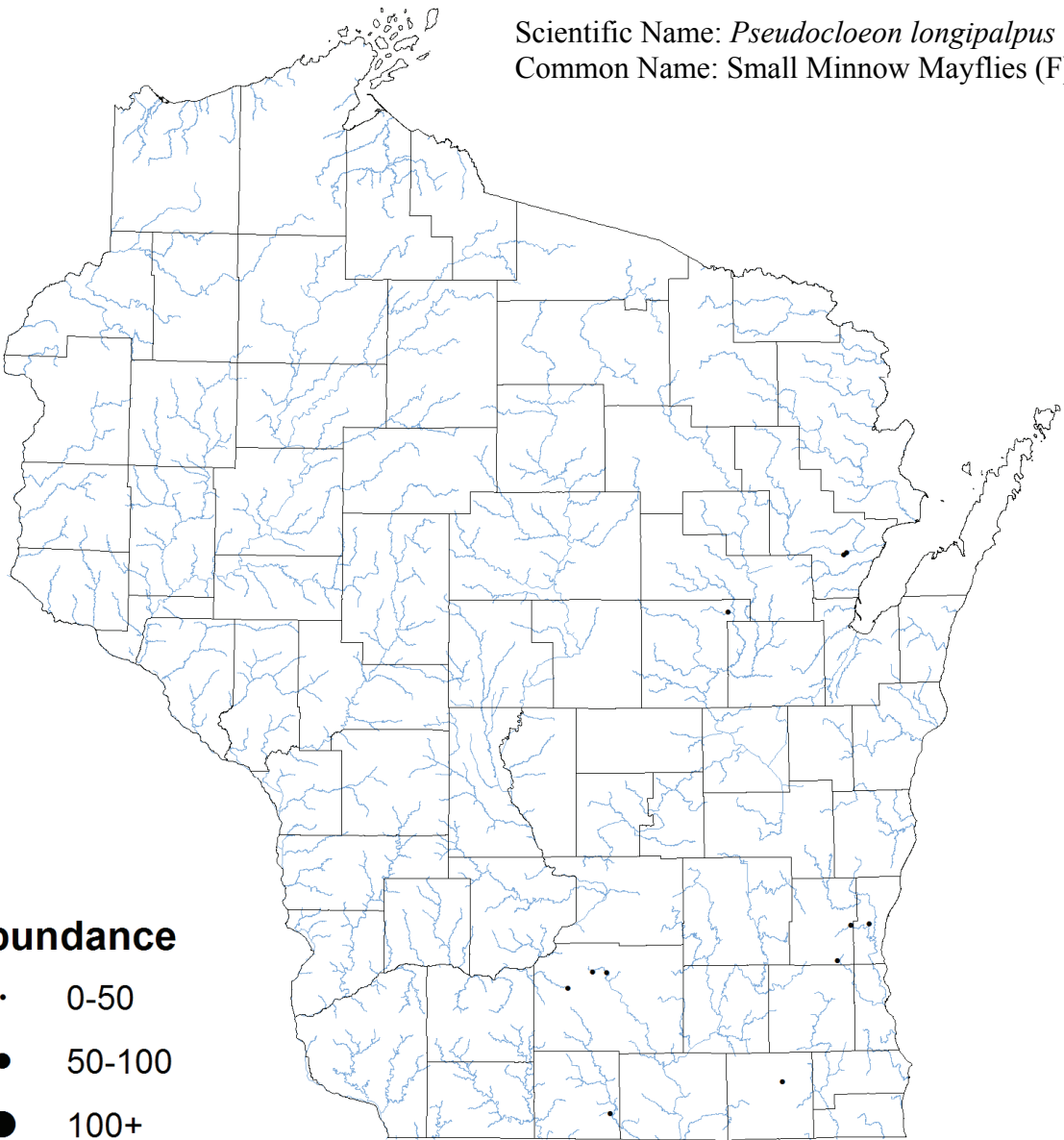


# Ephemeroptera Baetidae

Scientific Name: *Pseudocloeon longipalpus*  
 Common Name: Small Minnow Mayflies (F)

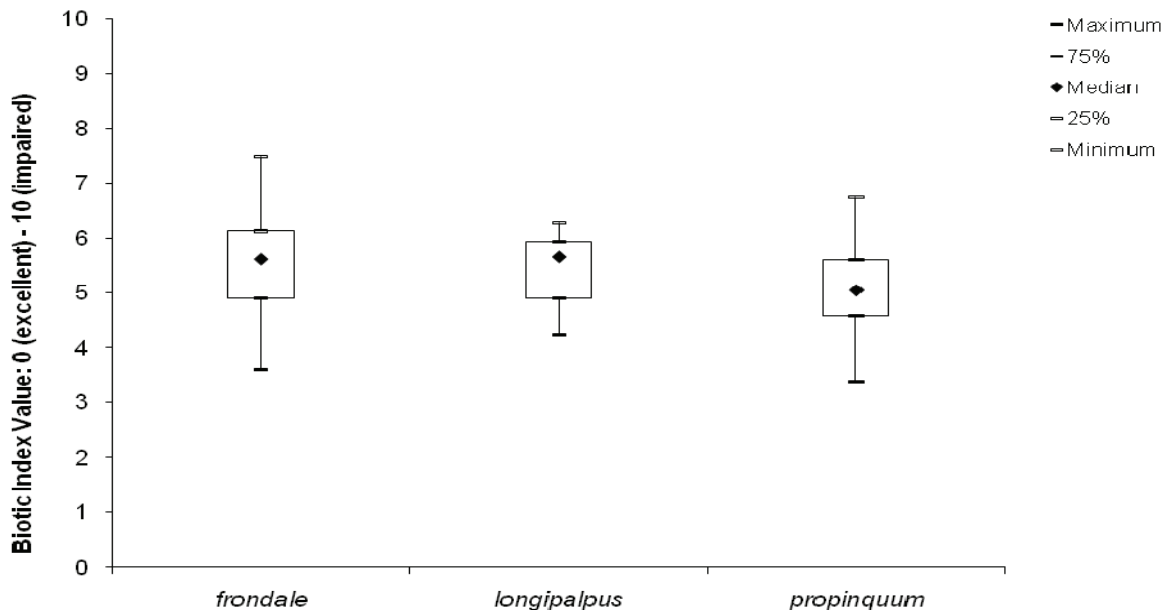
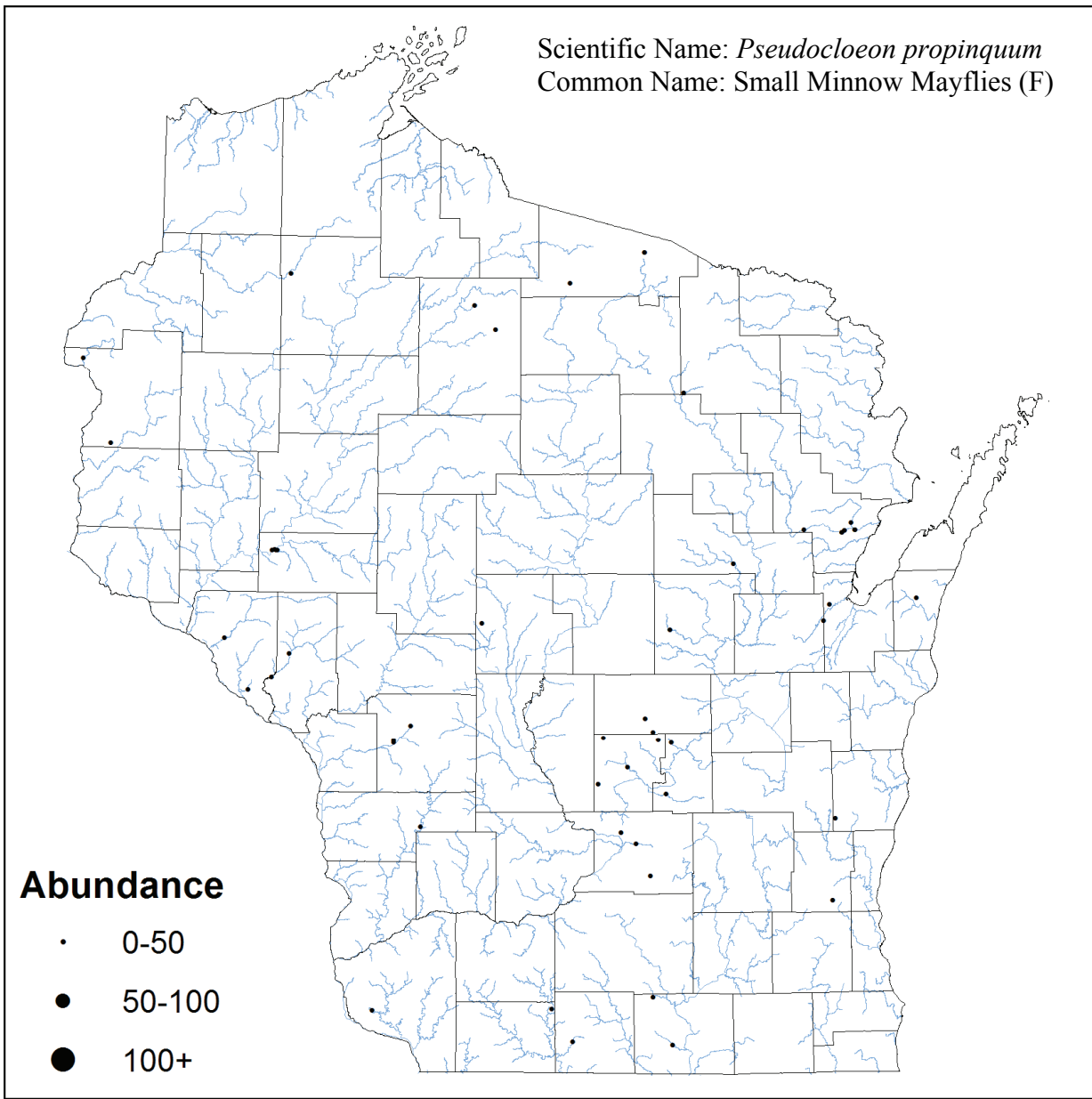
## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Baetidae

Scientific Name: *Pseudocloeon propinquum*  
 Common Name: Small Minnow Mayflies (F)

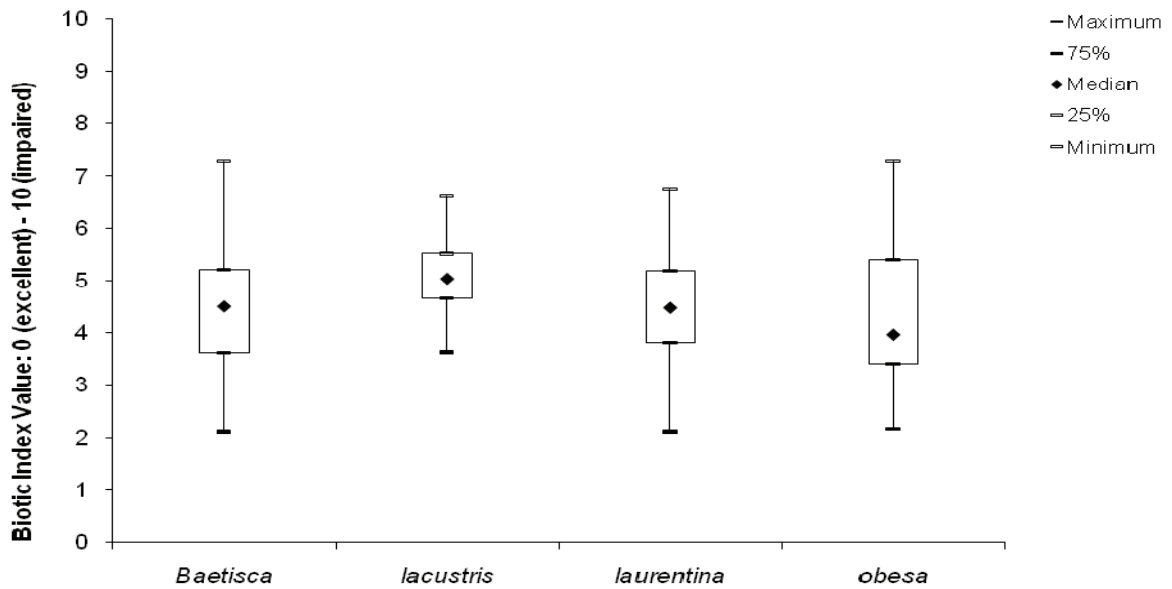
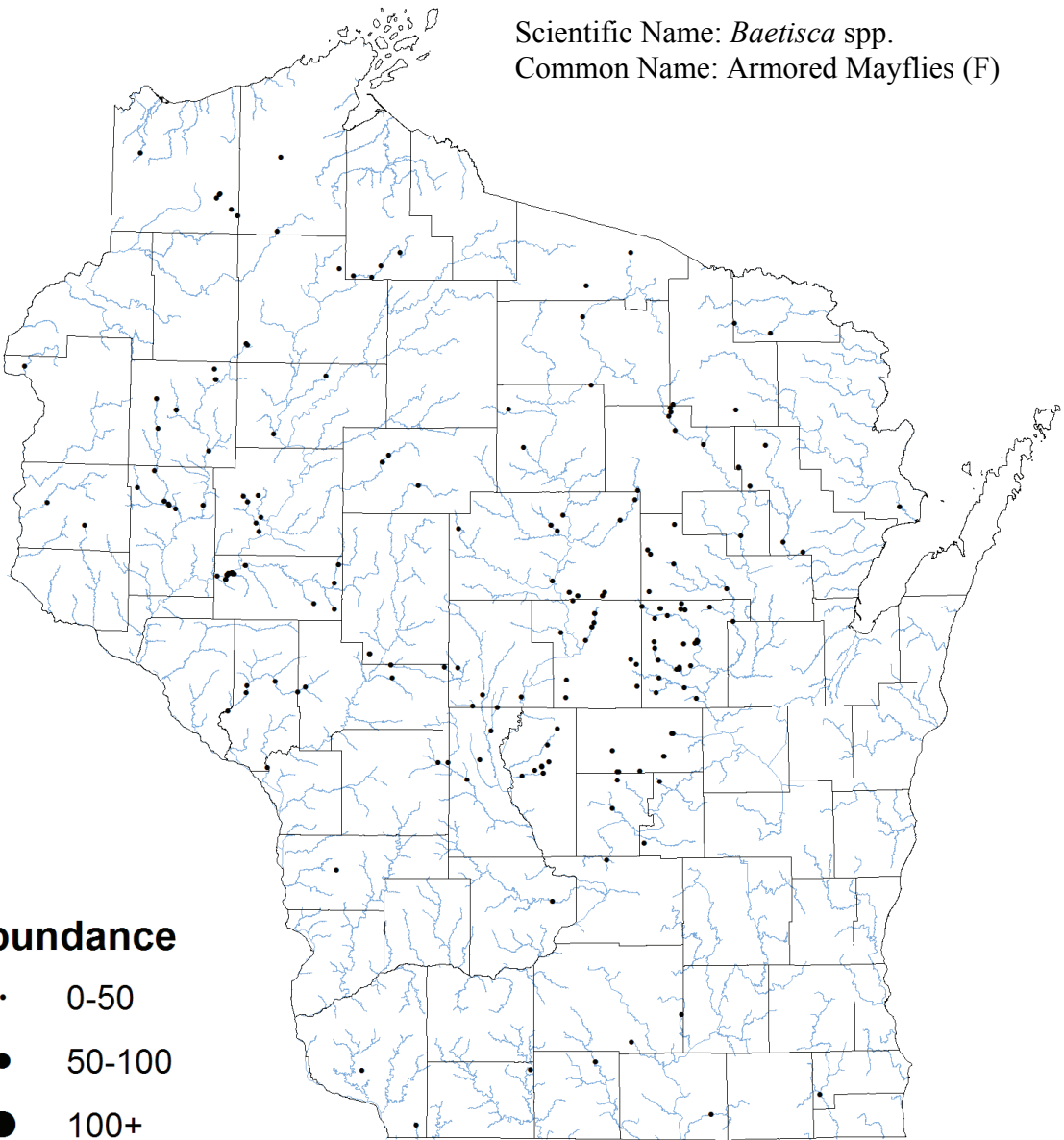


# Ephemeroptera Baetiscidae

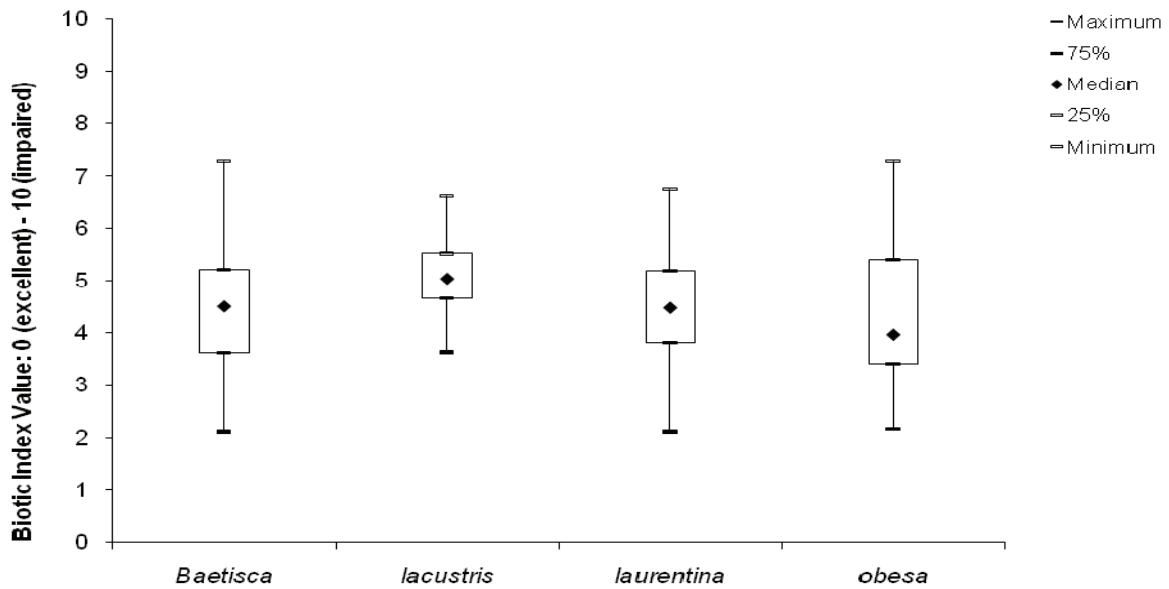
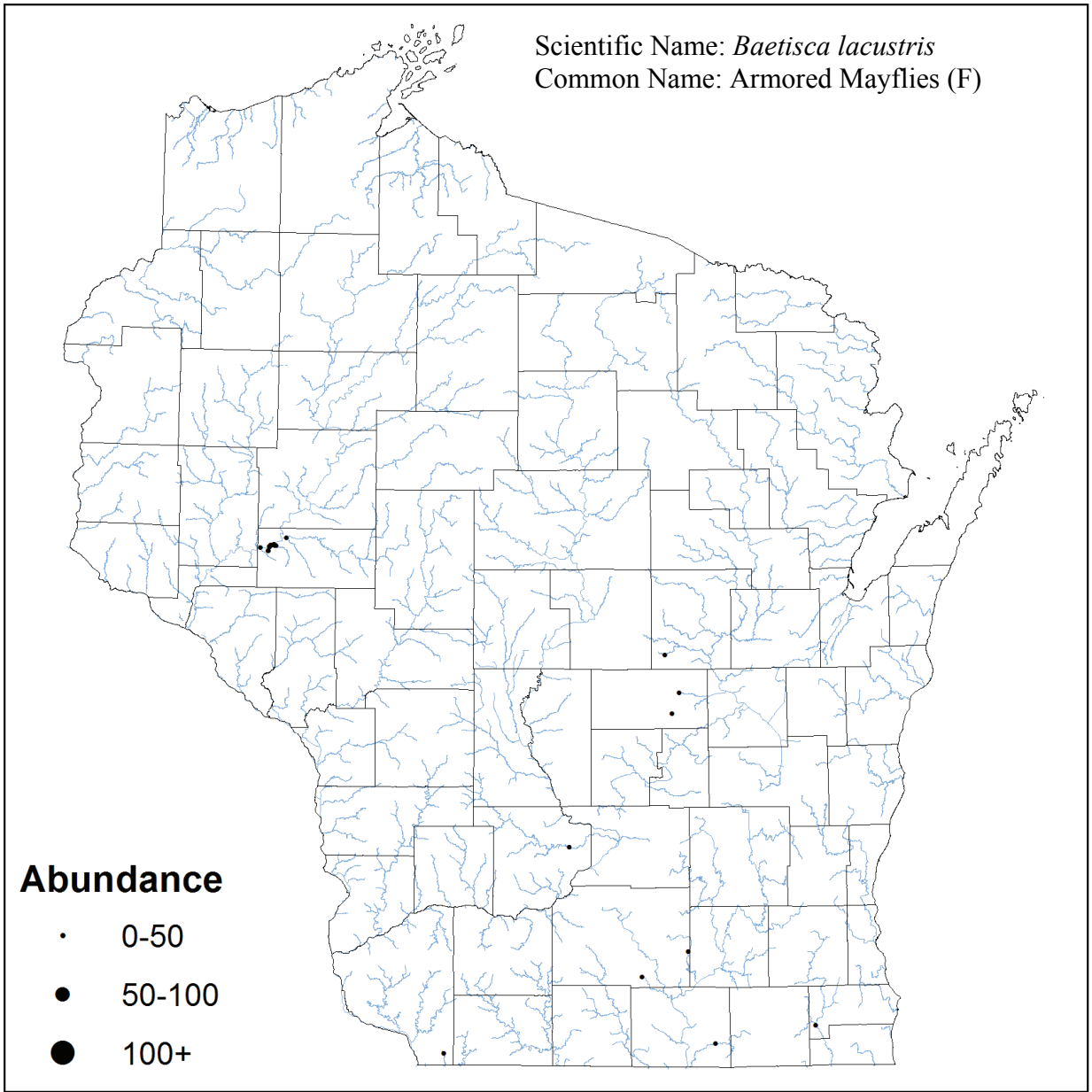
Scientific Name: *Baetisca* spp.  
 Common Name: Armored Mayflies (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Baetiscidae

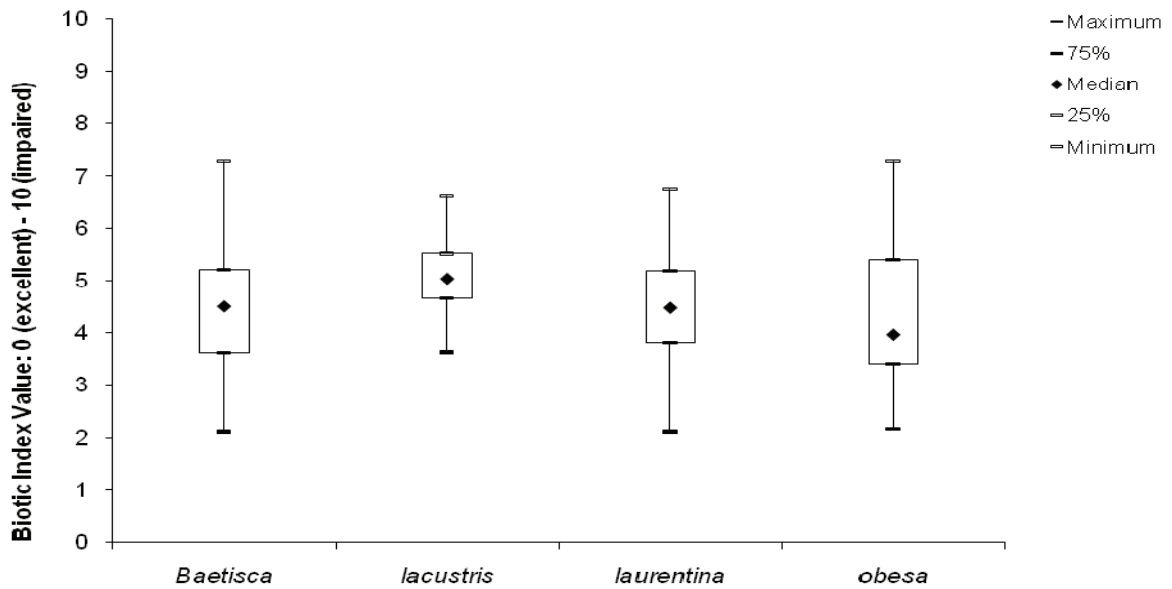
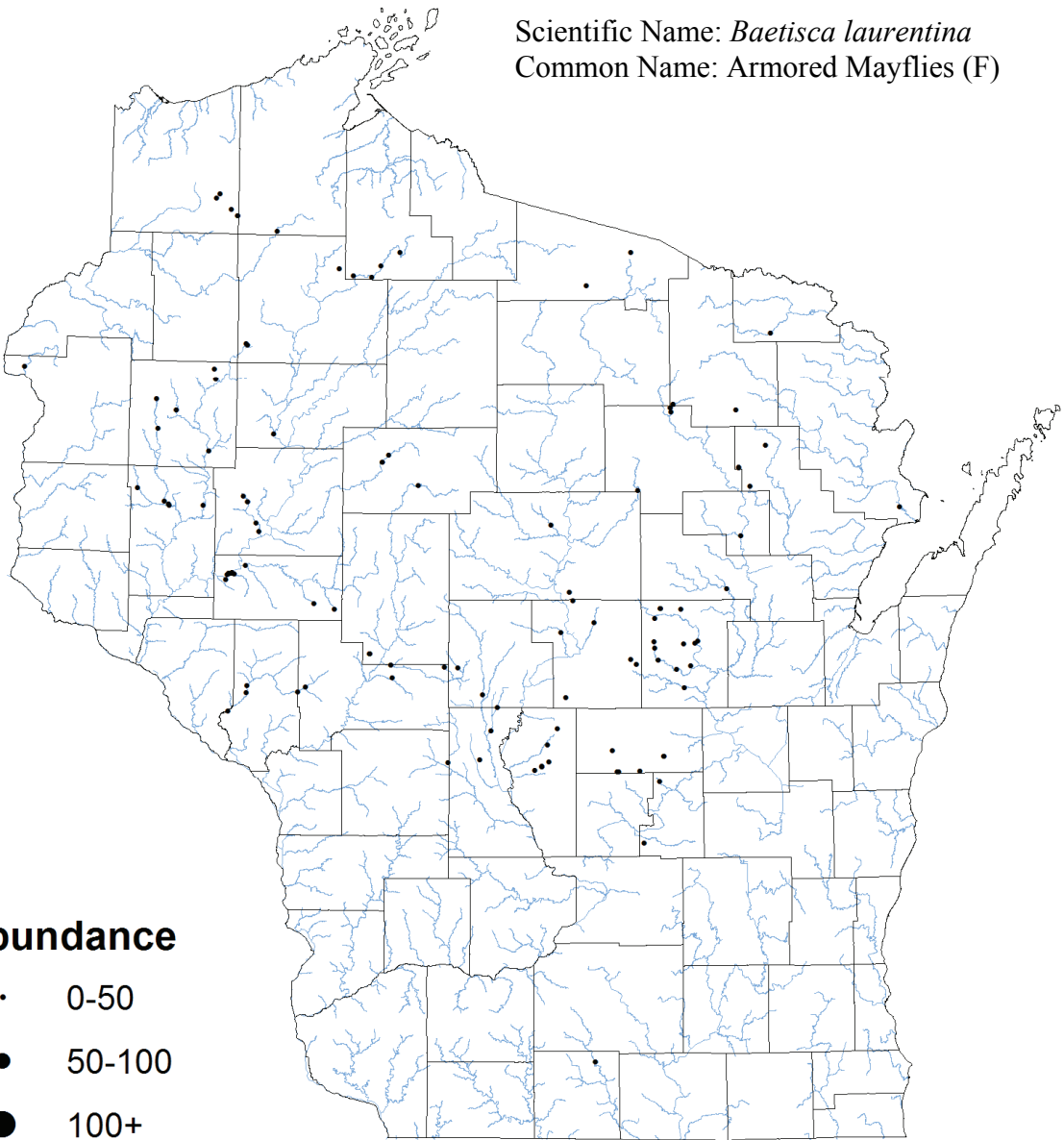


# Ephemeroptera Baetiscidae

Scientific Name: *Baetisca laurentina*  
 Common Name: Armored Mayflies (F)

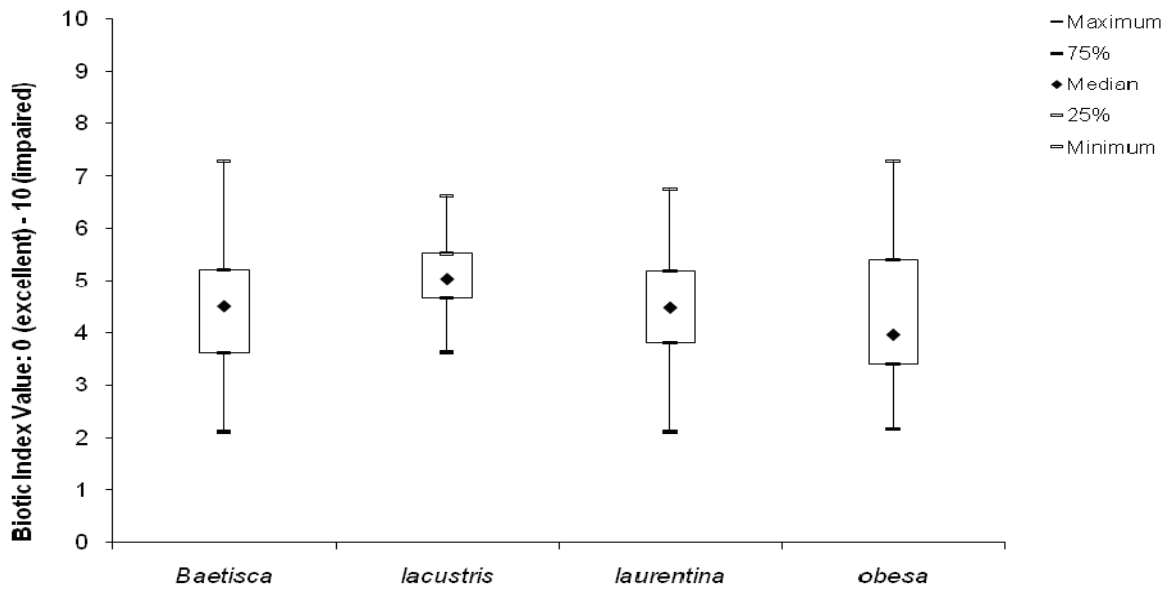
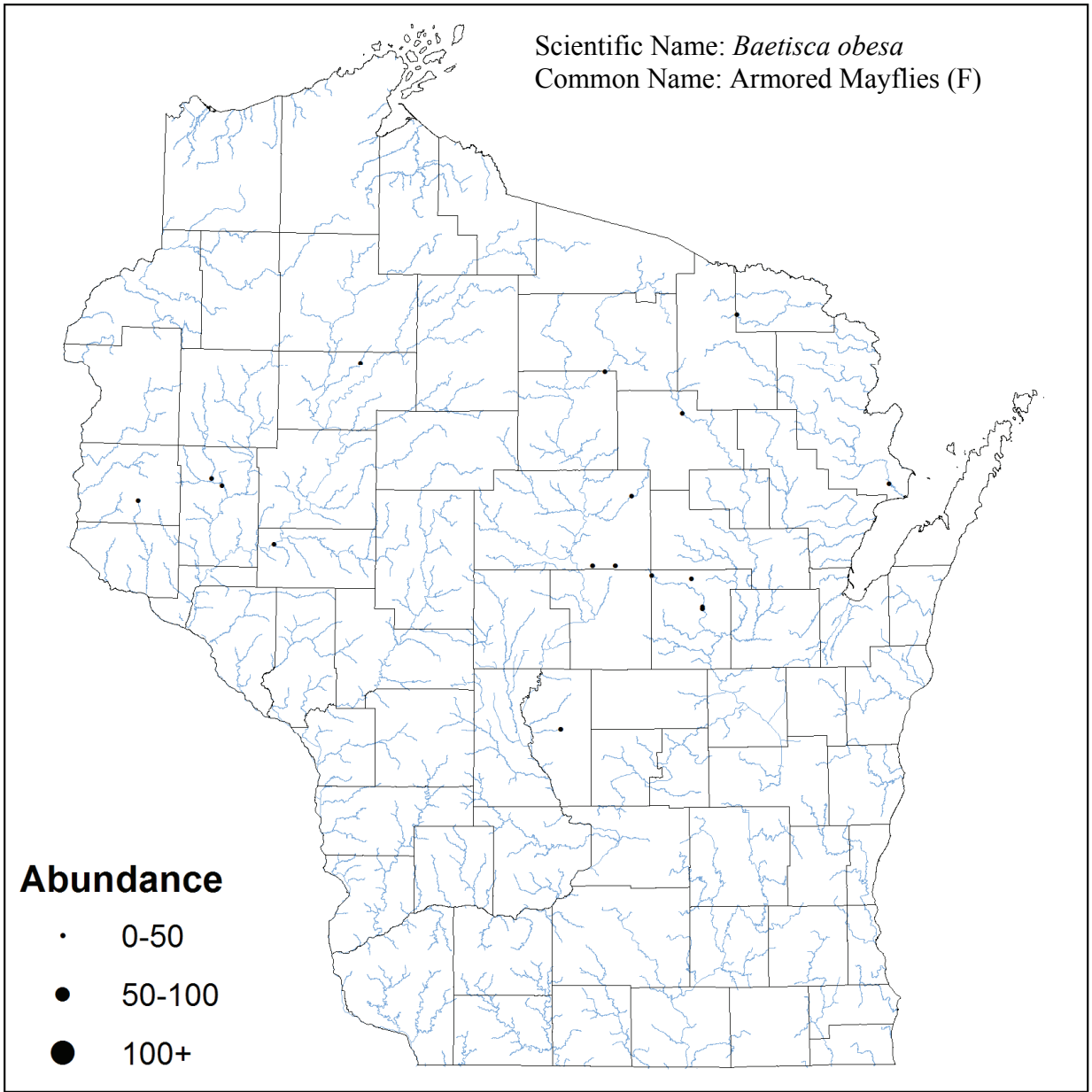
## Abundance

- 0-50
- 50-100
- 100+

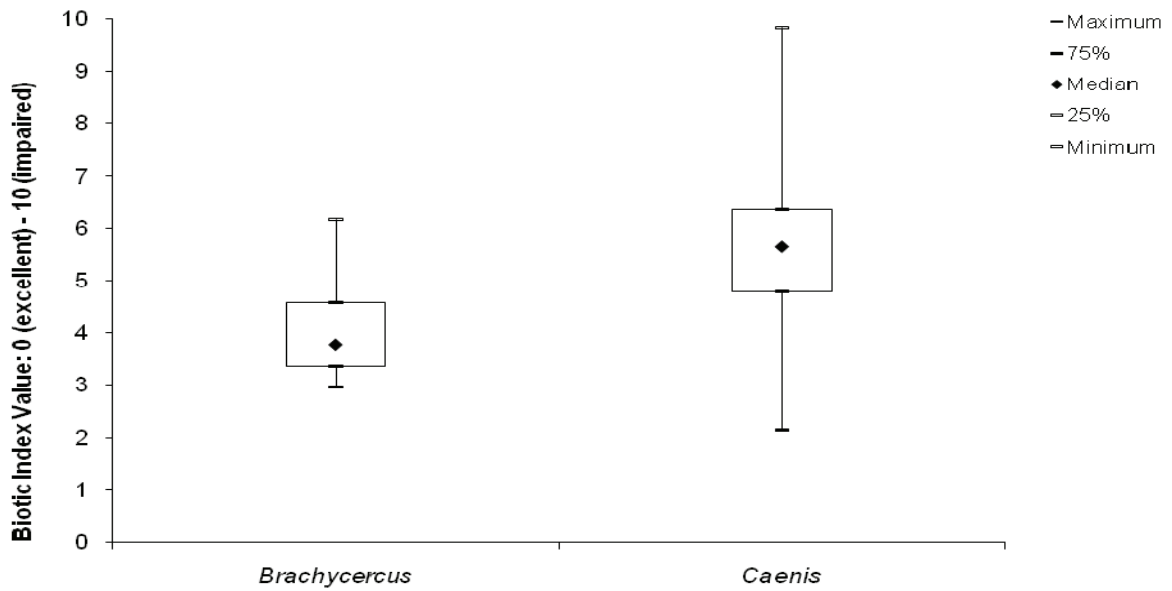
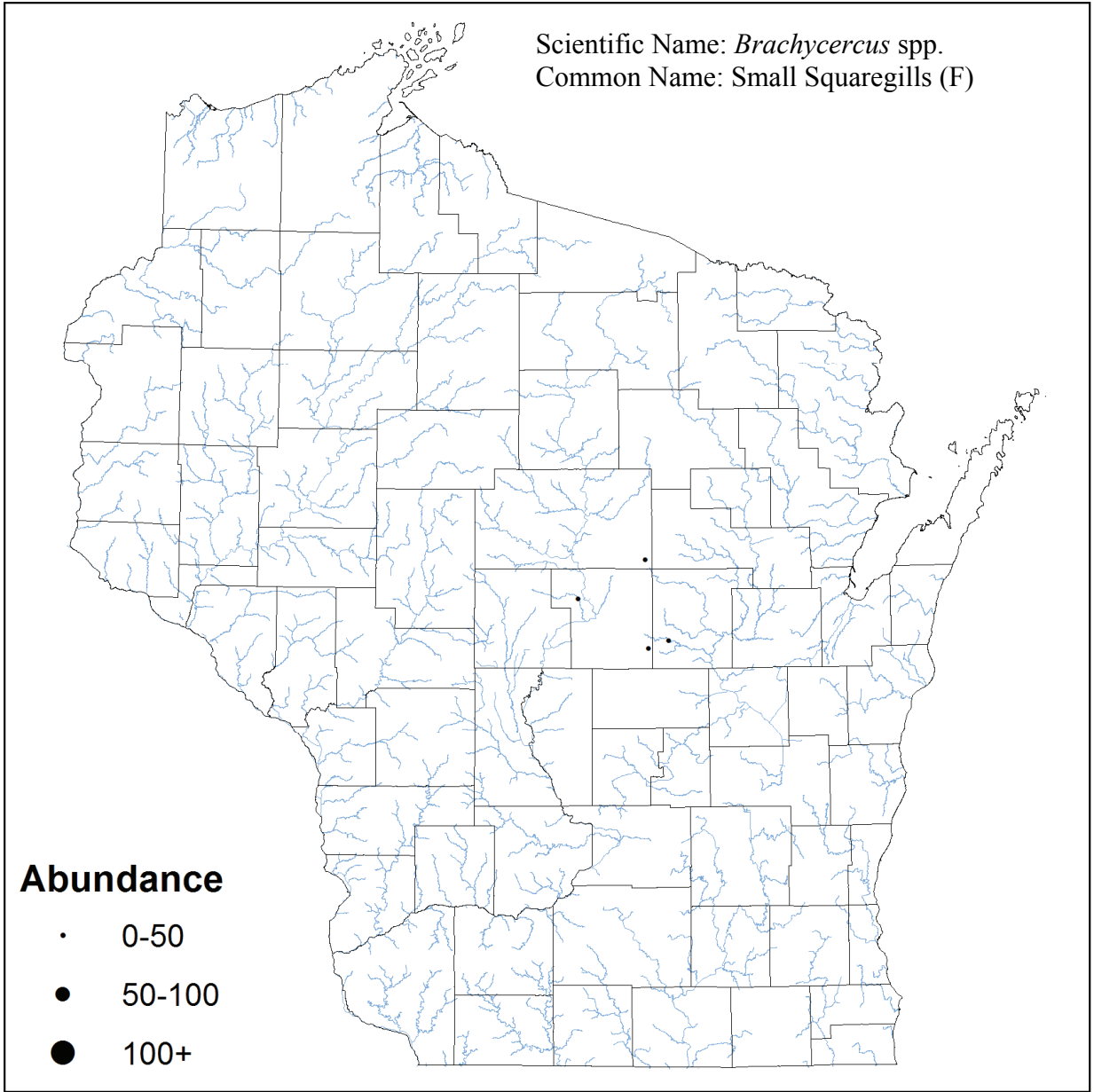




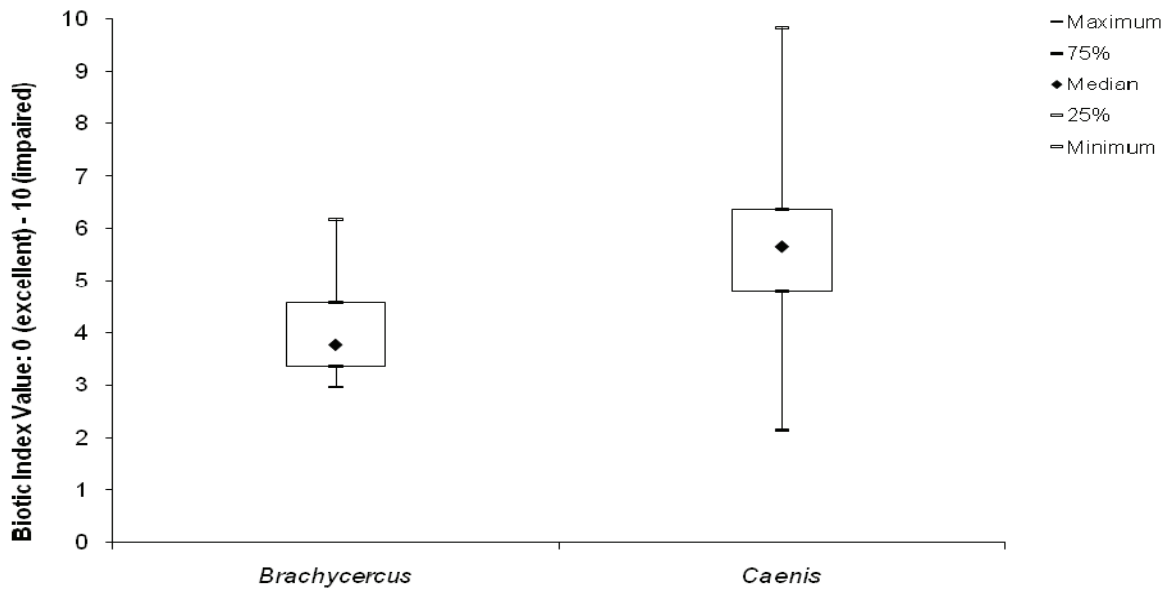
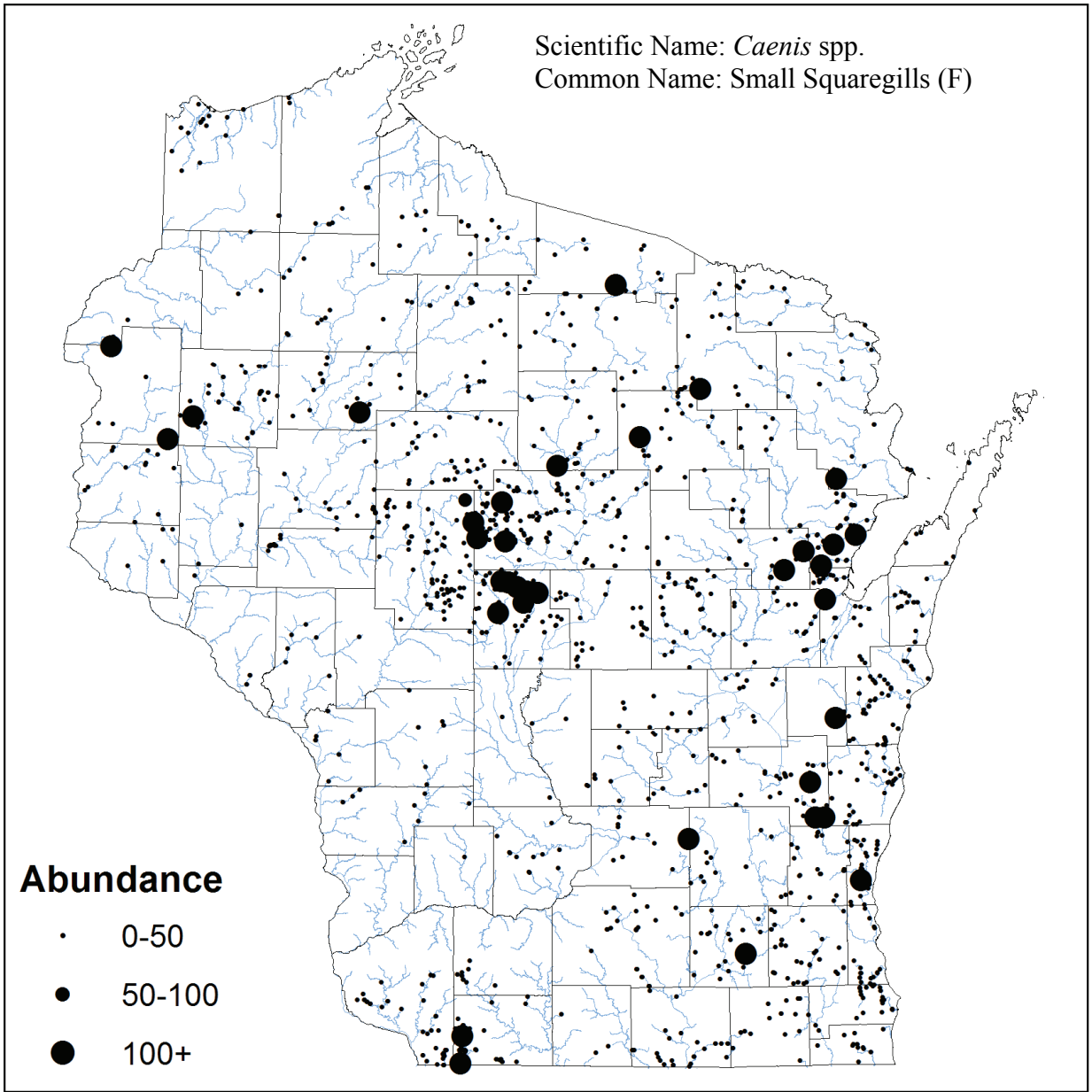
# Ephemeroptera Baetiscidae



# Ephemeroptera Caenidae



# Ephemeroptera Caenidae

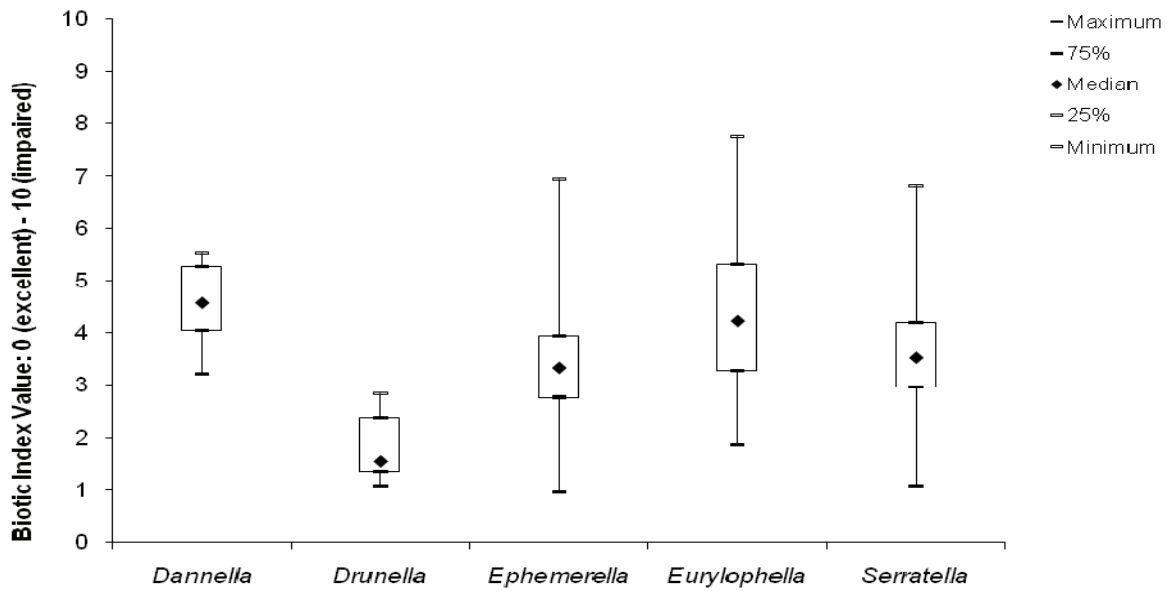
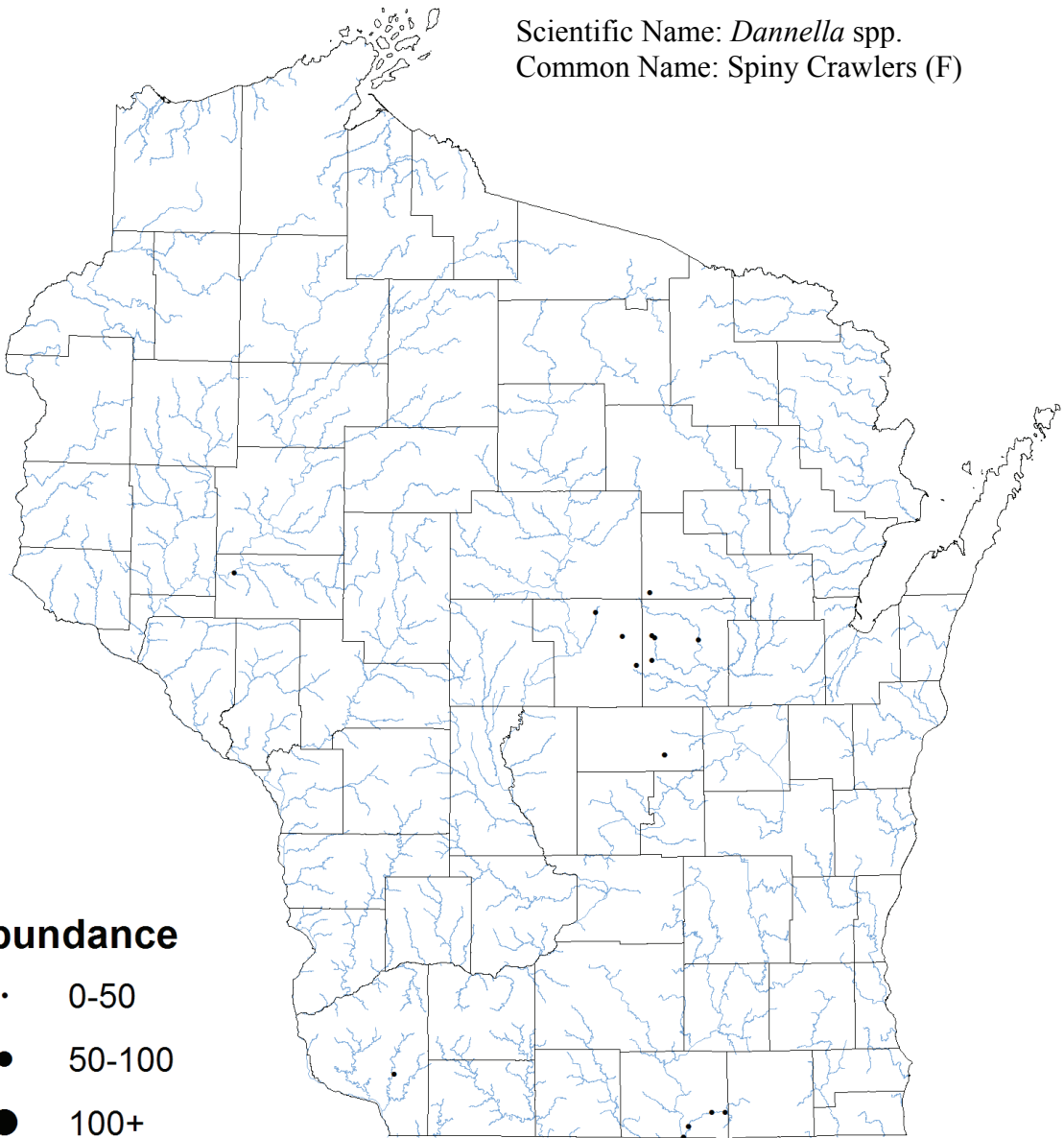


# Ephemeroptera Ephemereilidae

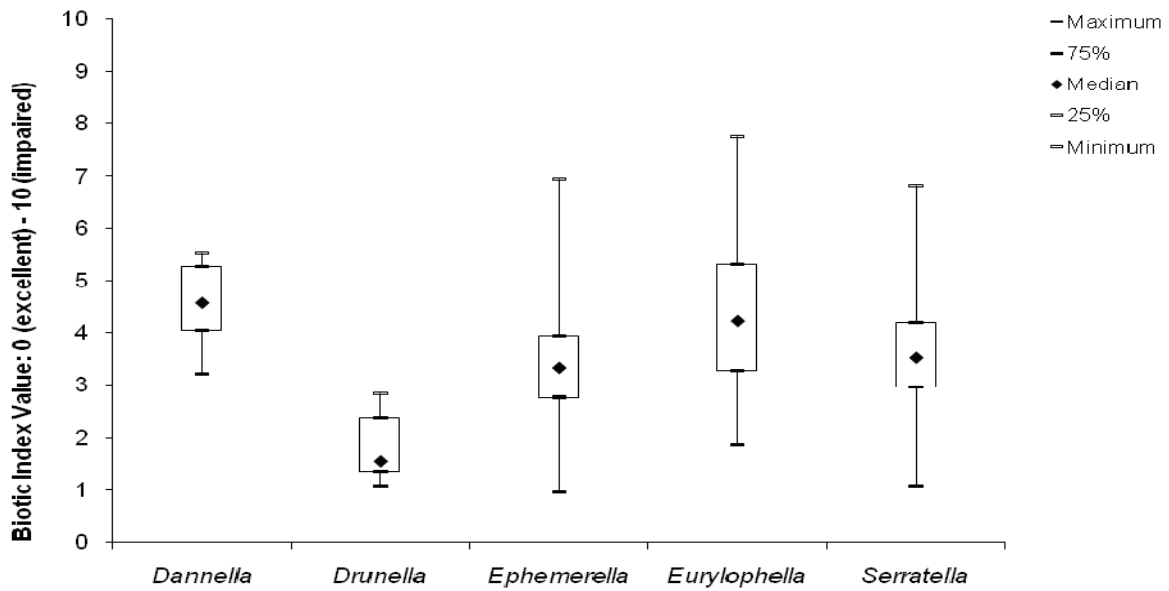
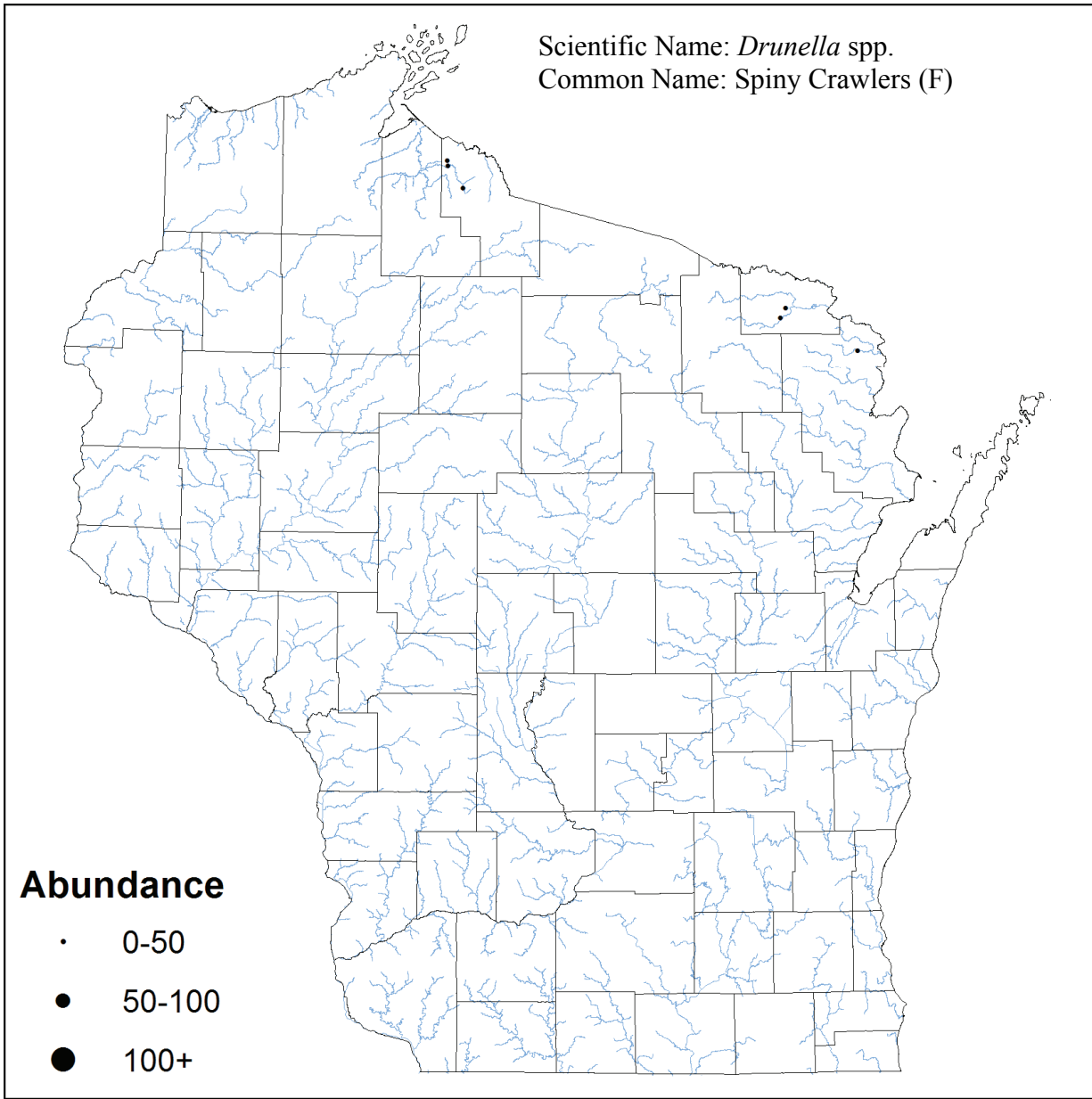
Scientific Name: *Dannella* spp.  
 Common Name: Spiny Crawlers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemrellidae

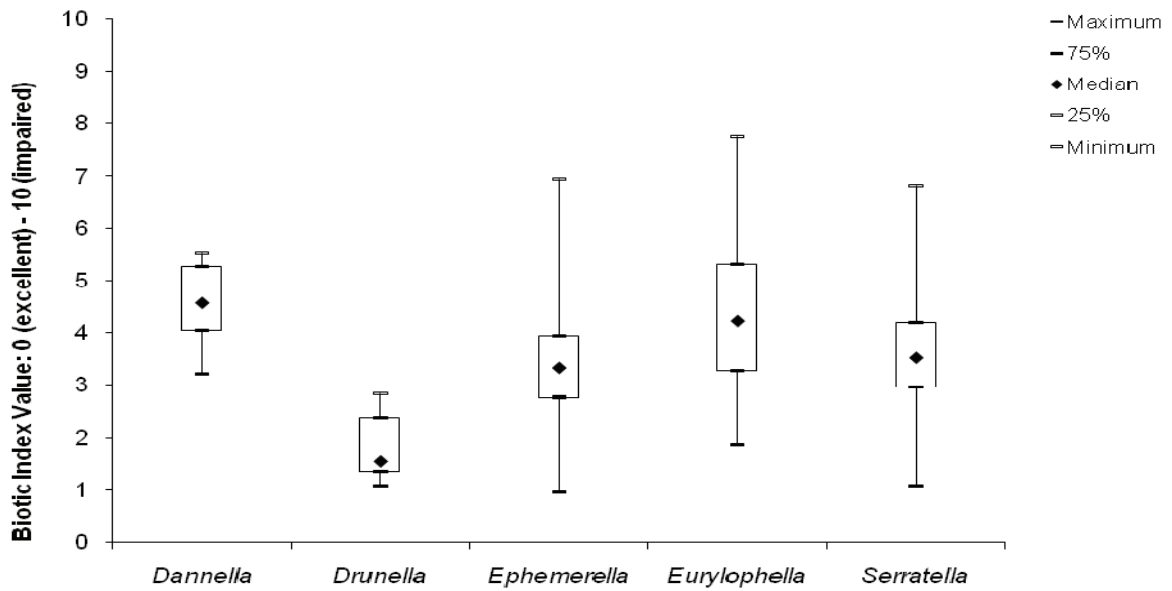
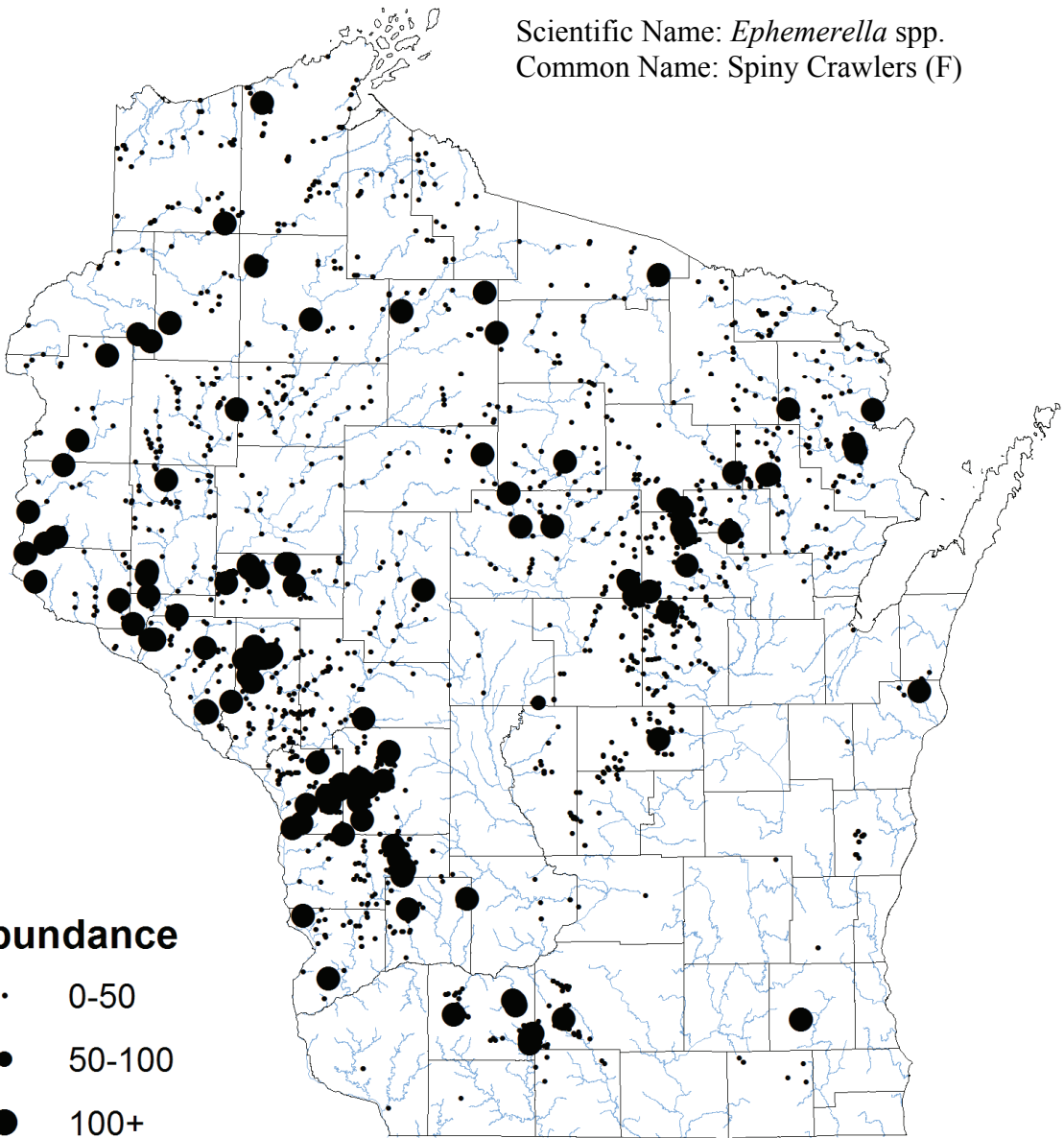


# Ephemeroptera Ephemereilidae

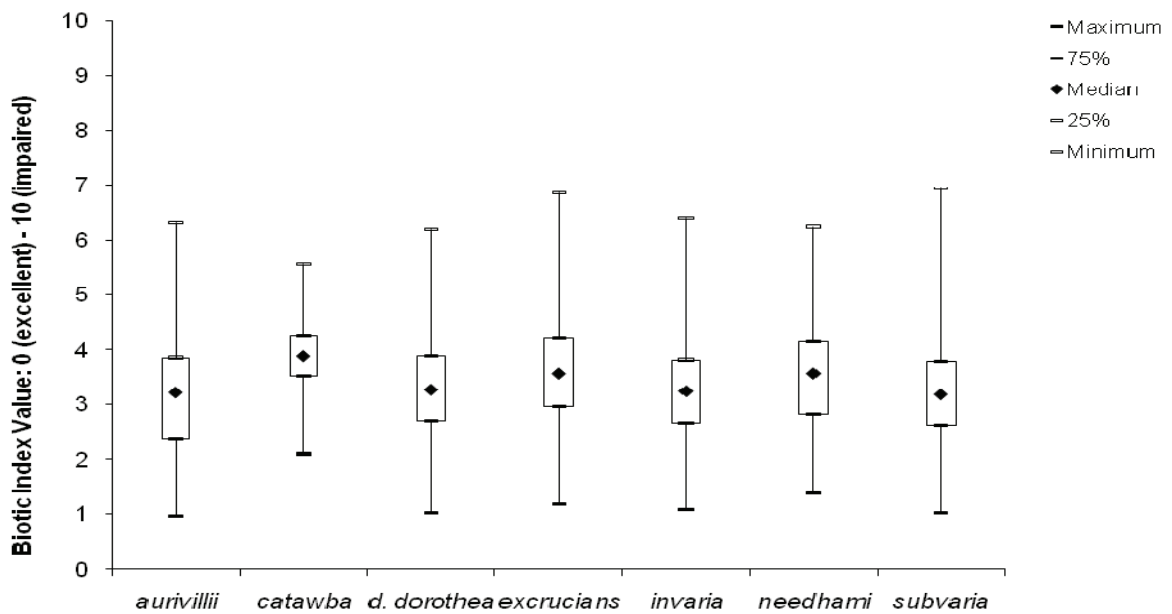
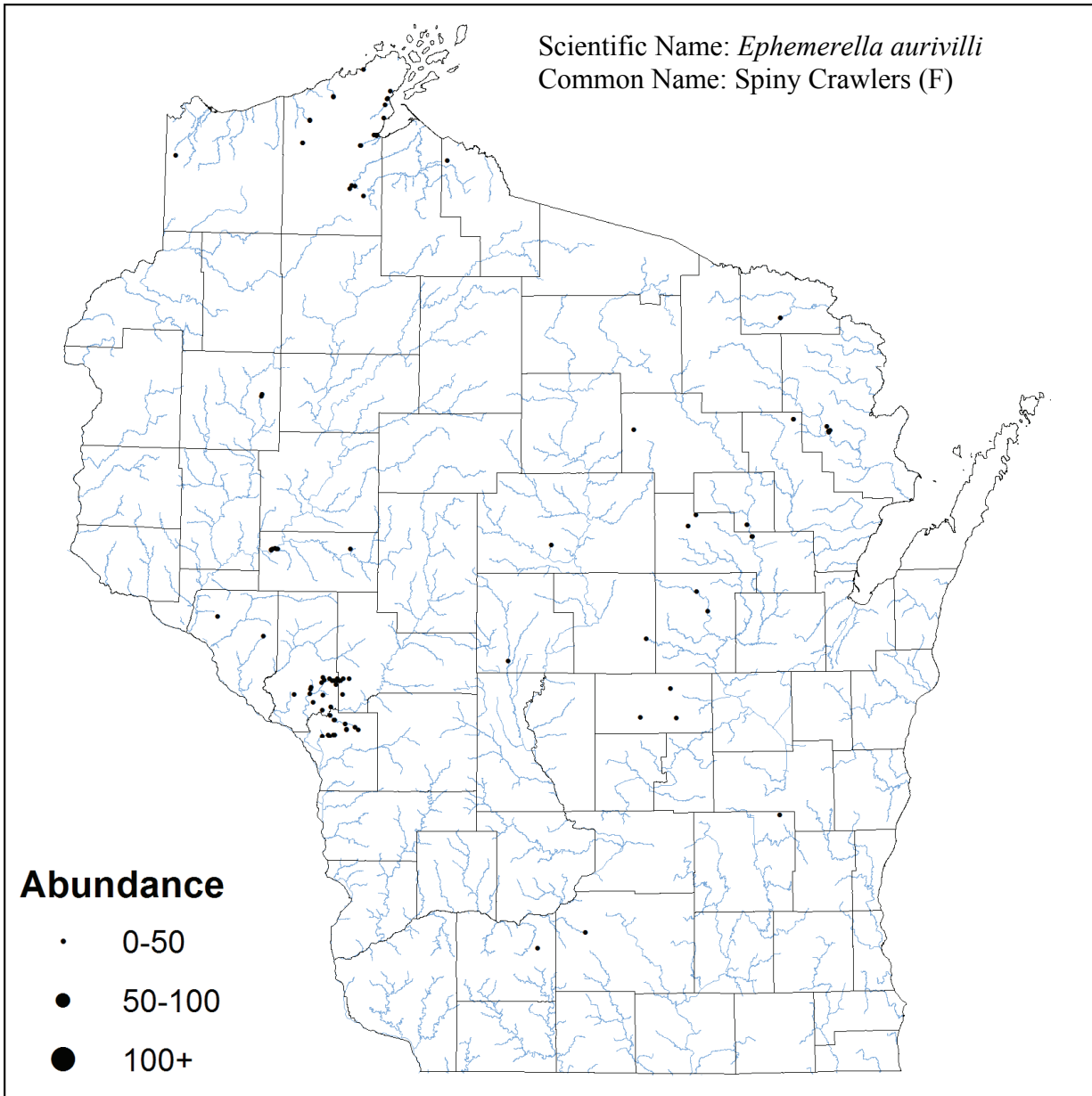
Scientific Name: *Ephemera* spp.  
 Common Name: Spiny Crawlers (F)

## Abundance

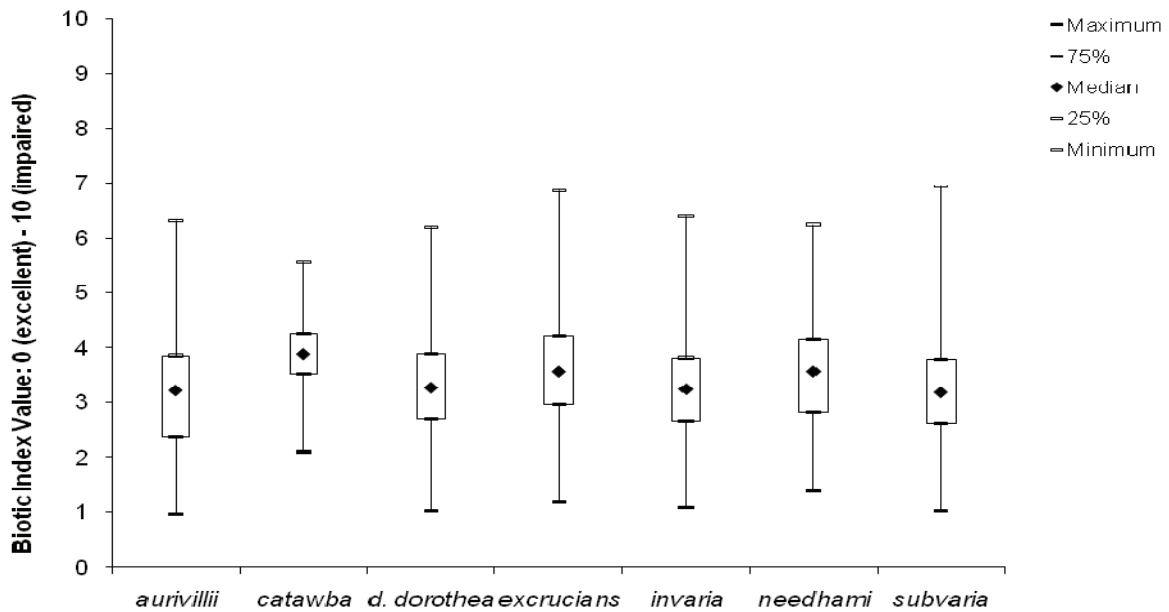
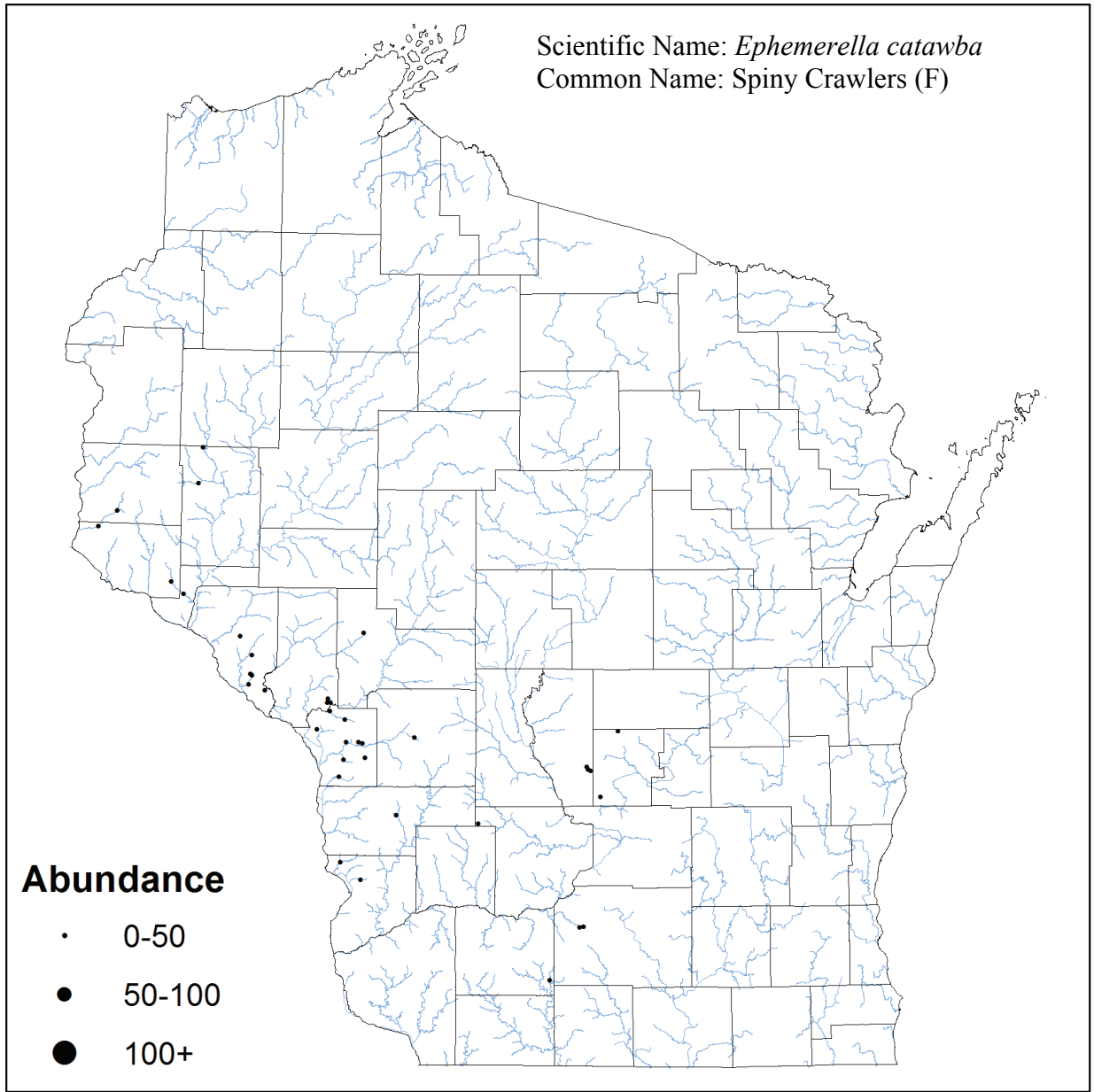
- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemellidae

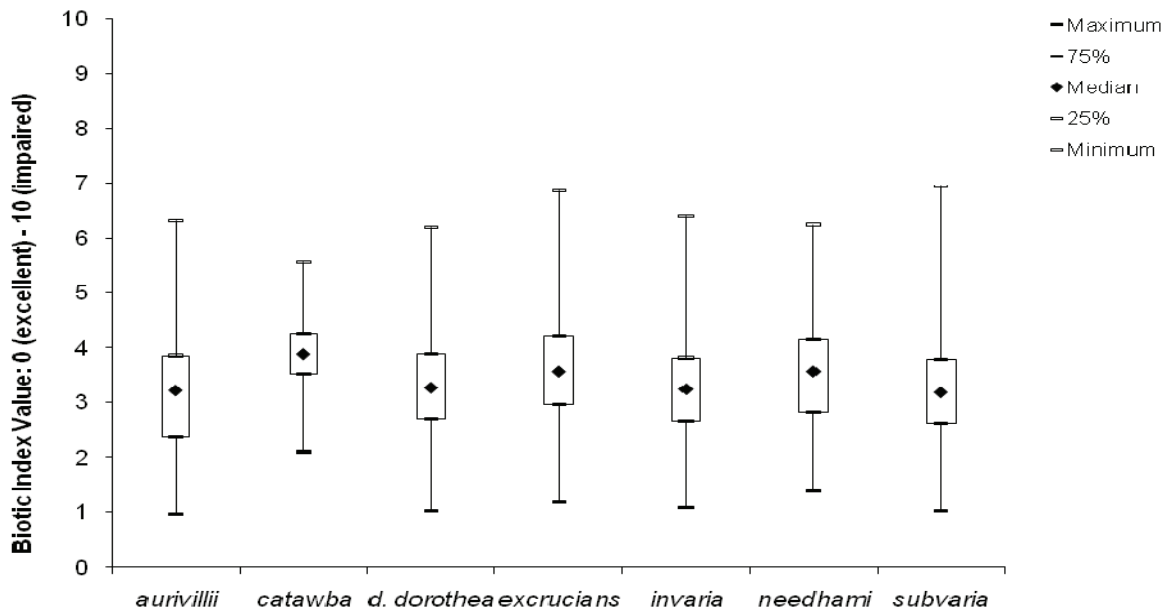
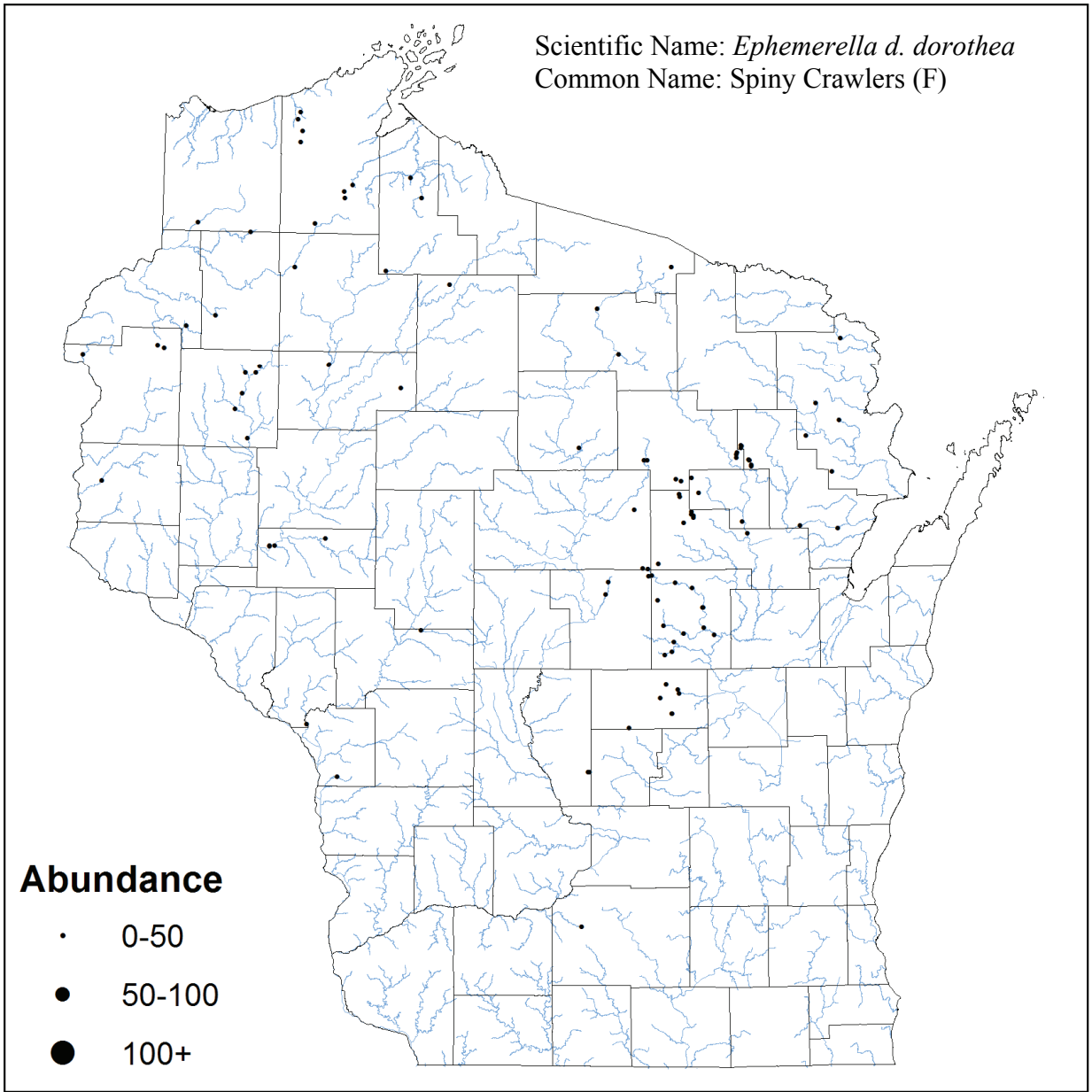


# Ephemeroptera Ephemereilidae





# Ephemeroptera Ephemellidae

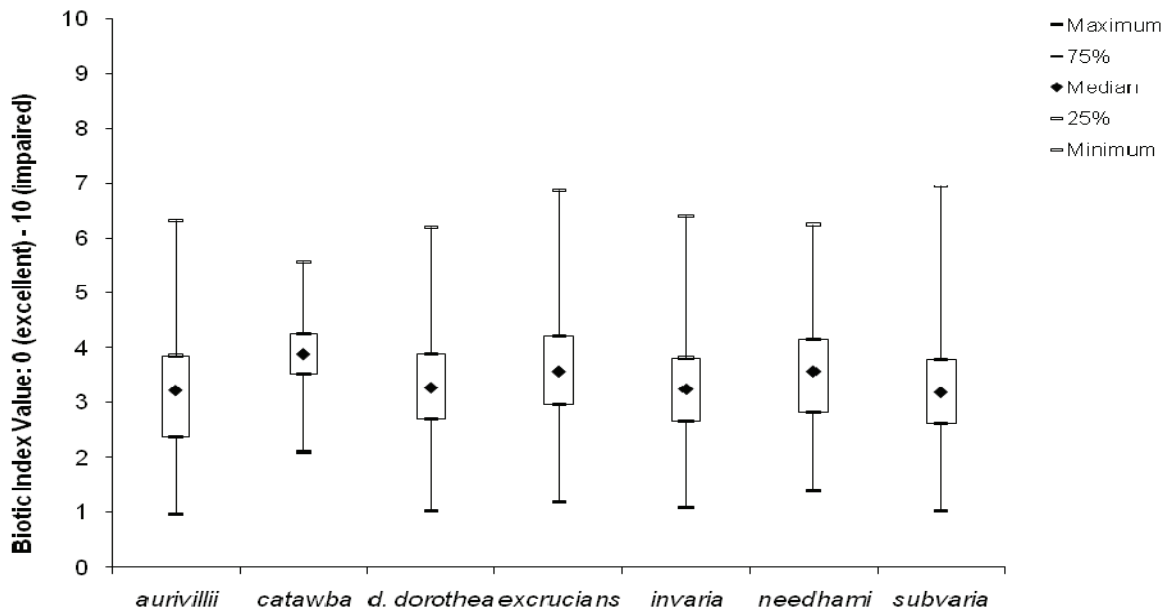
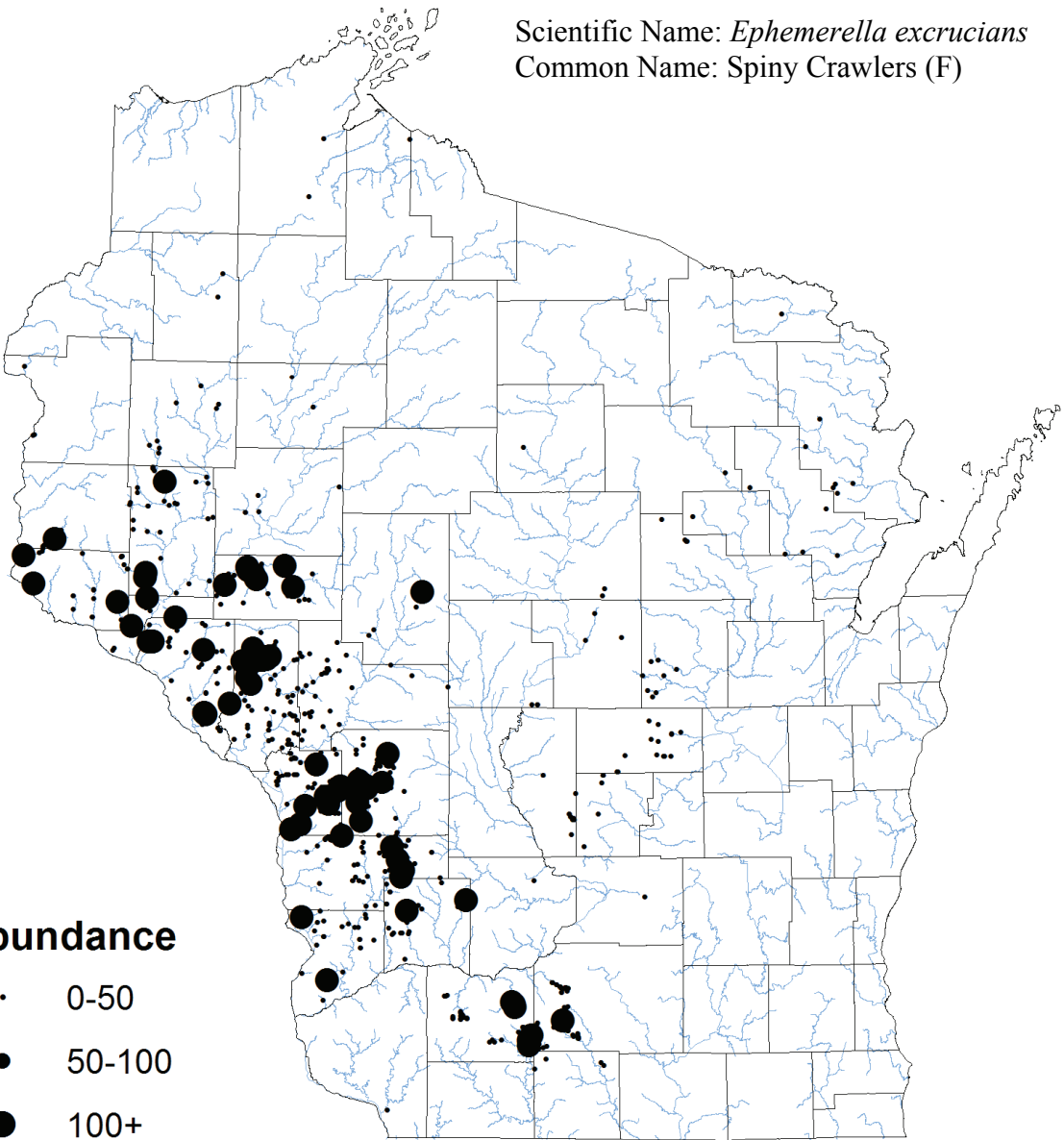


# Ephemeroptera Ephemereilidae

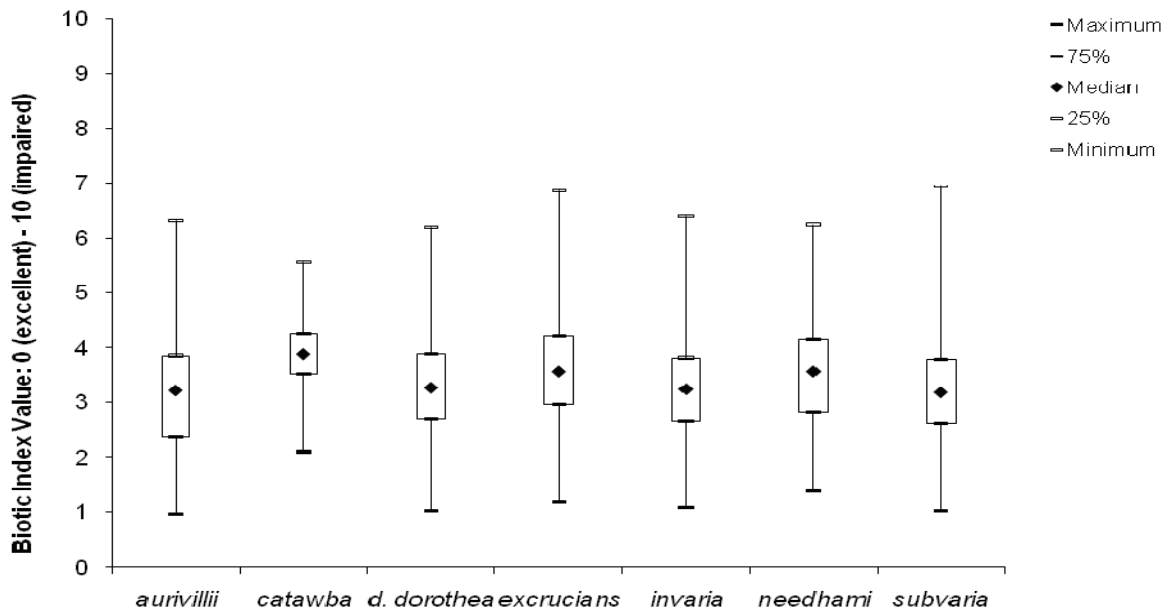
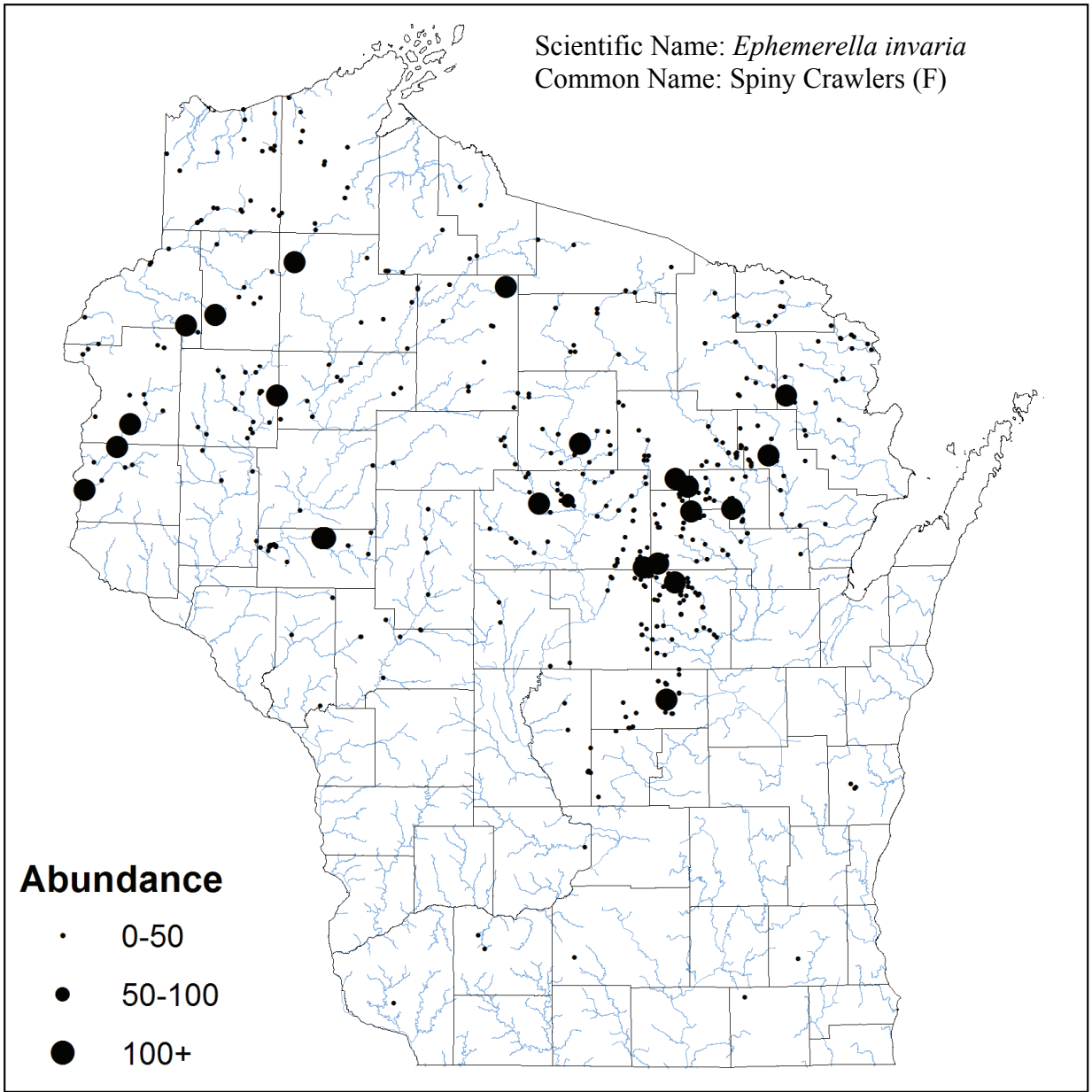
Scientific Name: *Ephemerella excrucians*  
 Common Name: Spiny Crawlers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemellidae

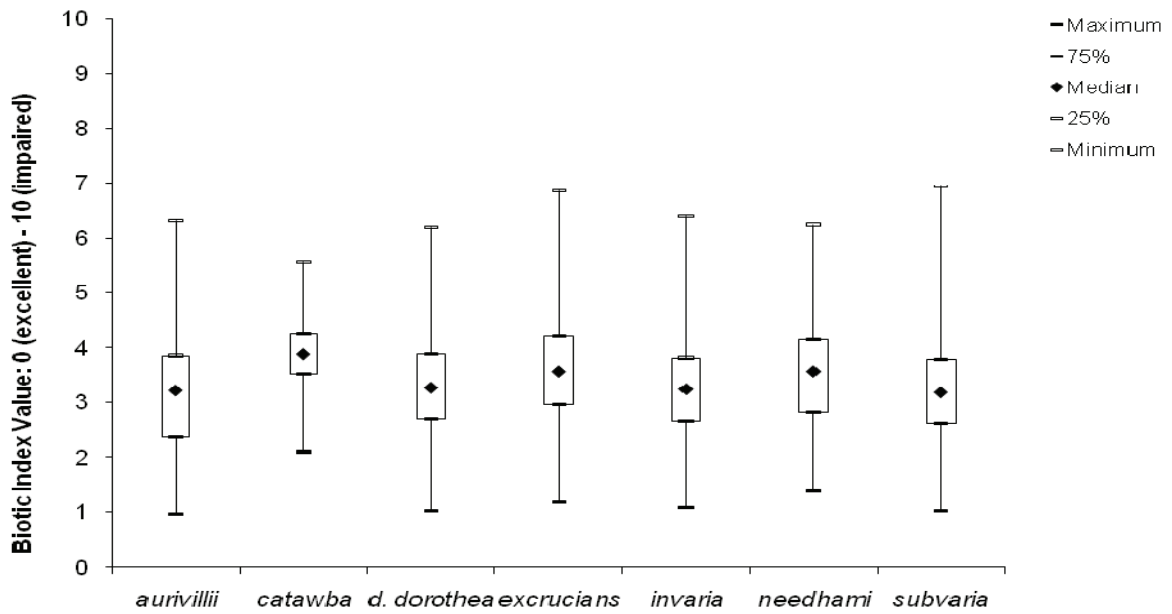
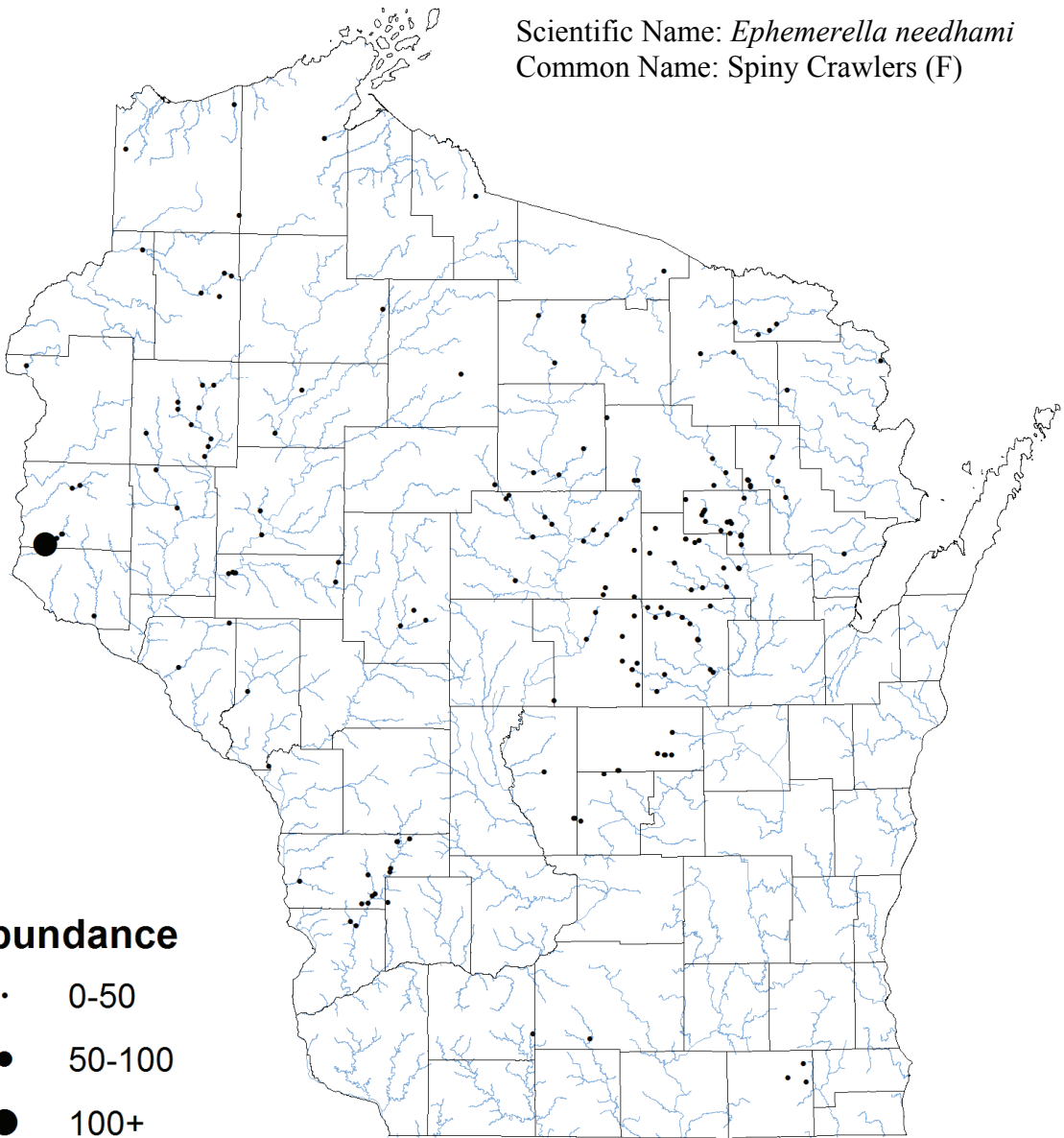


# Ephemeroptera Ephemereilidae

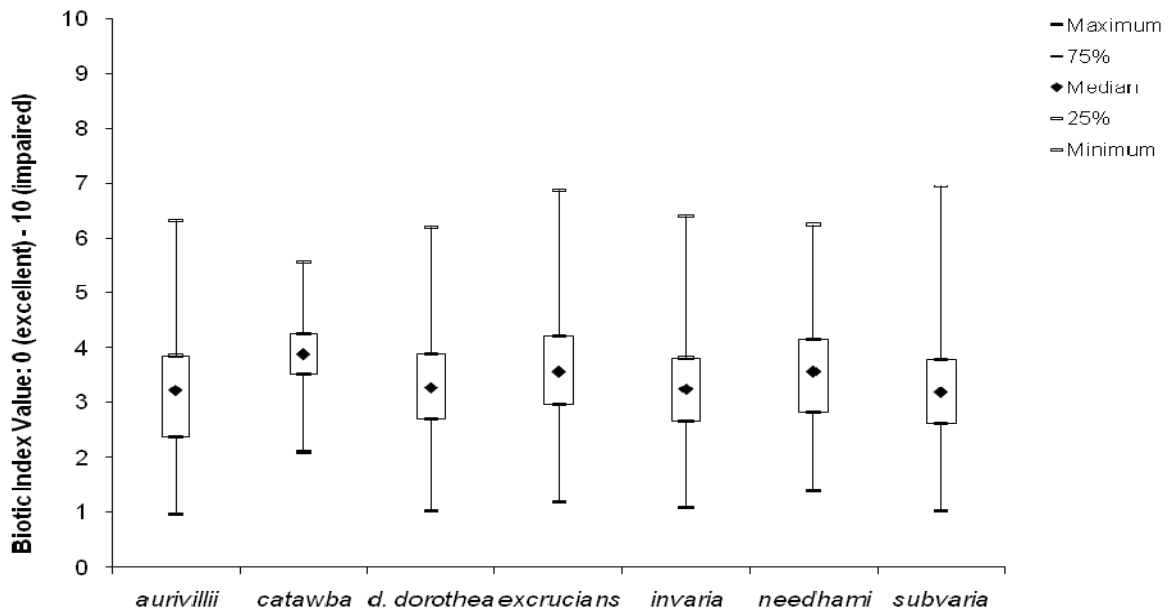
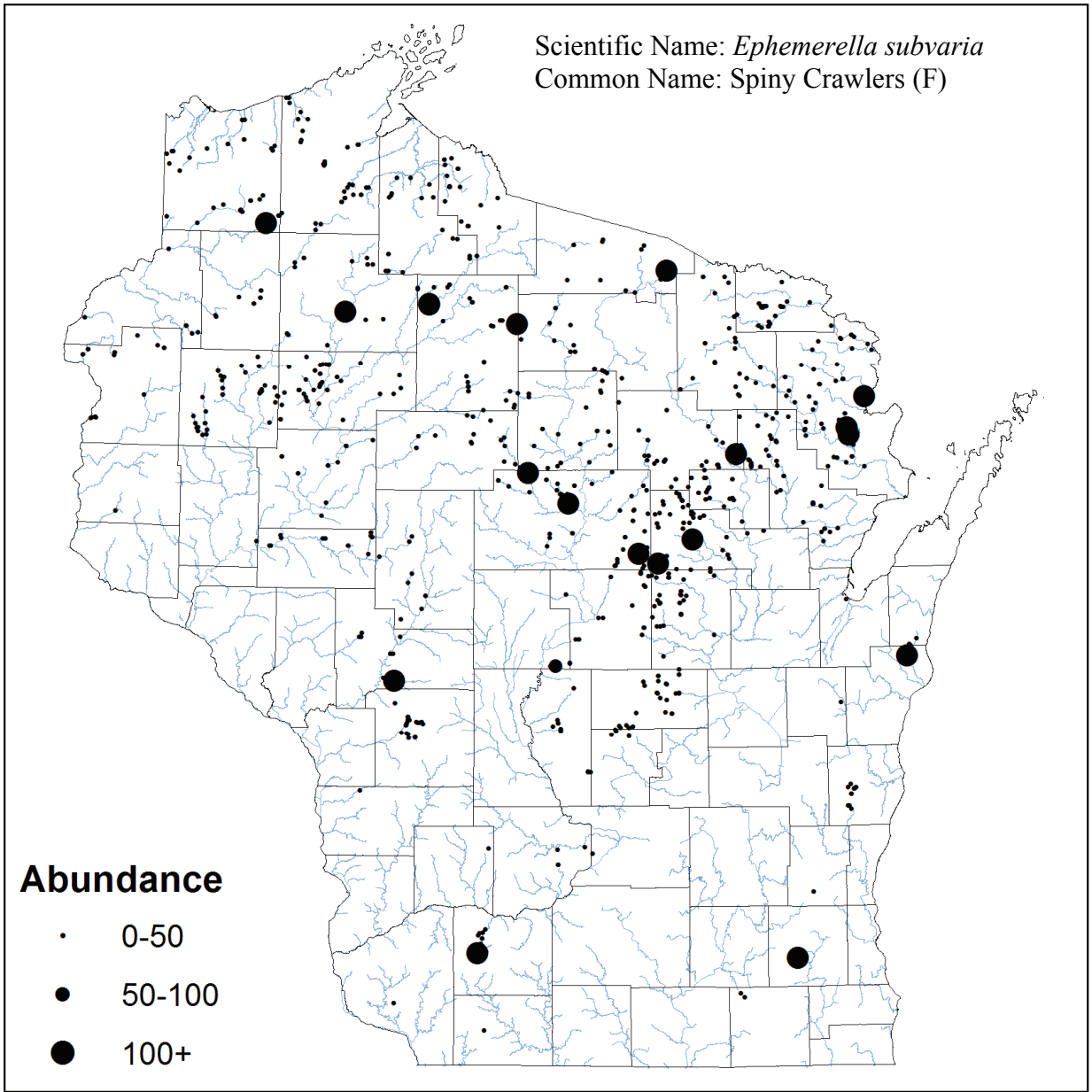
Scientific Name: *Ephemerella needhami*  
 Common Name: Spiny Crawlers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemrellidae

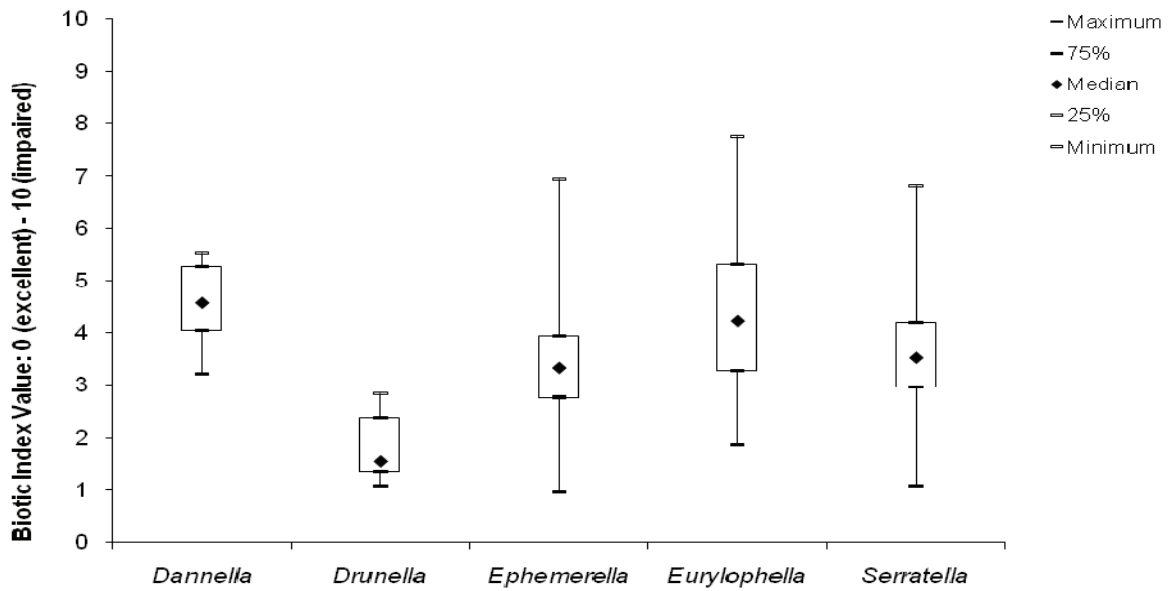
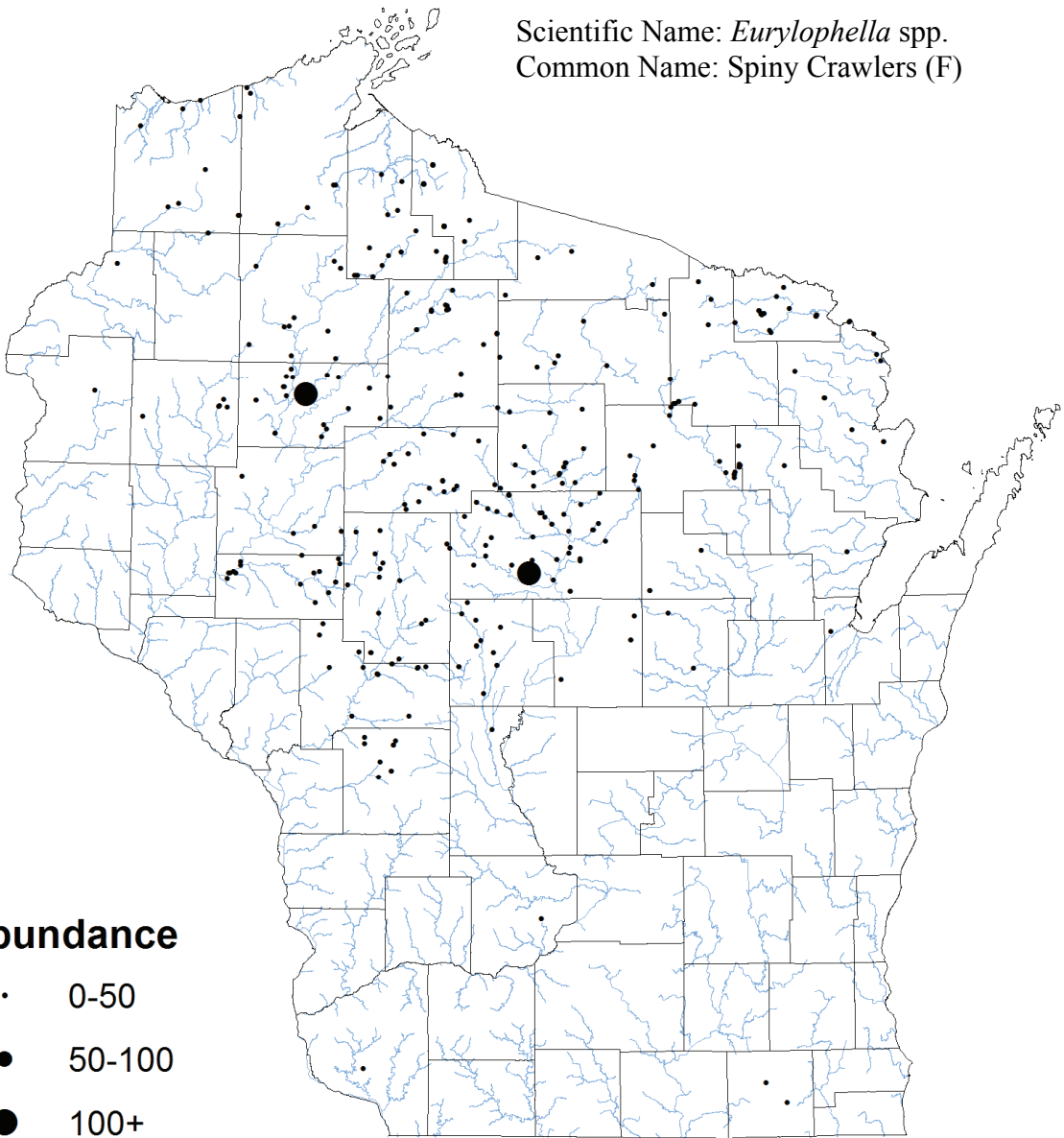


# Ephemeroptera Ephemereilidae

Scientific Name: *Eurylophella* spp.  
 Common Name: Spiny Crawlers (F)

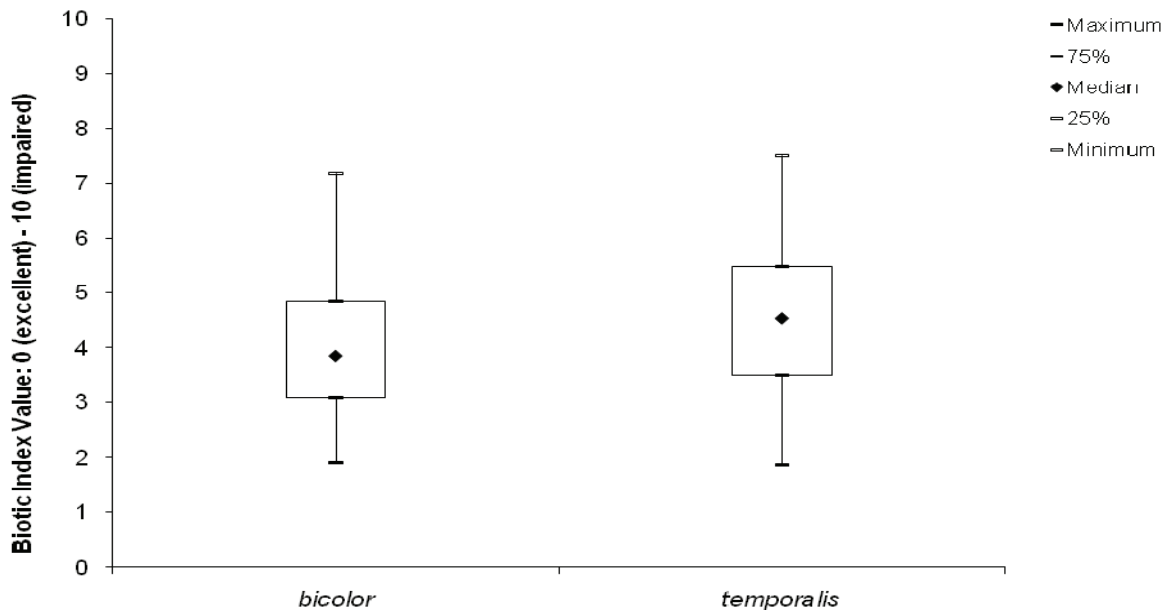
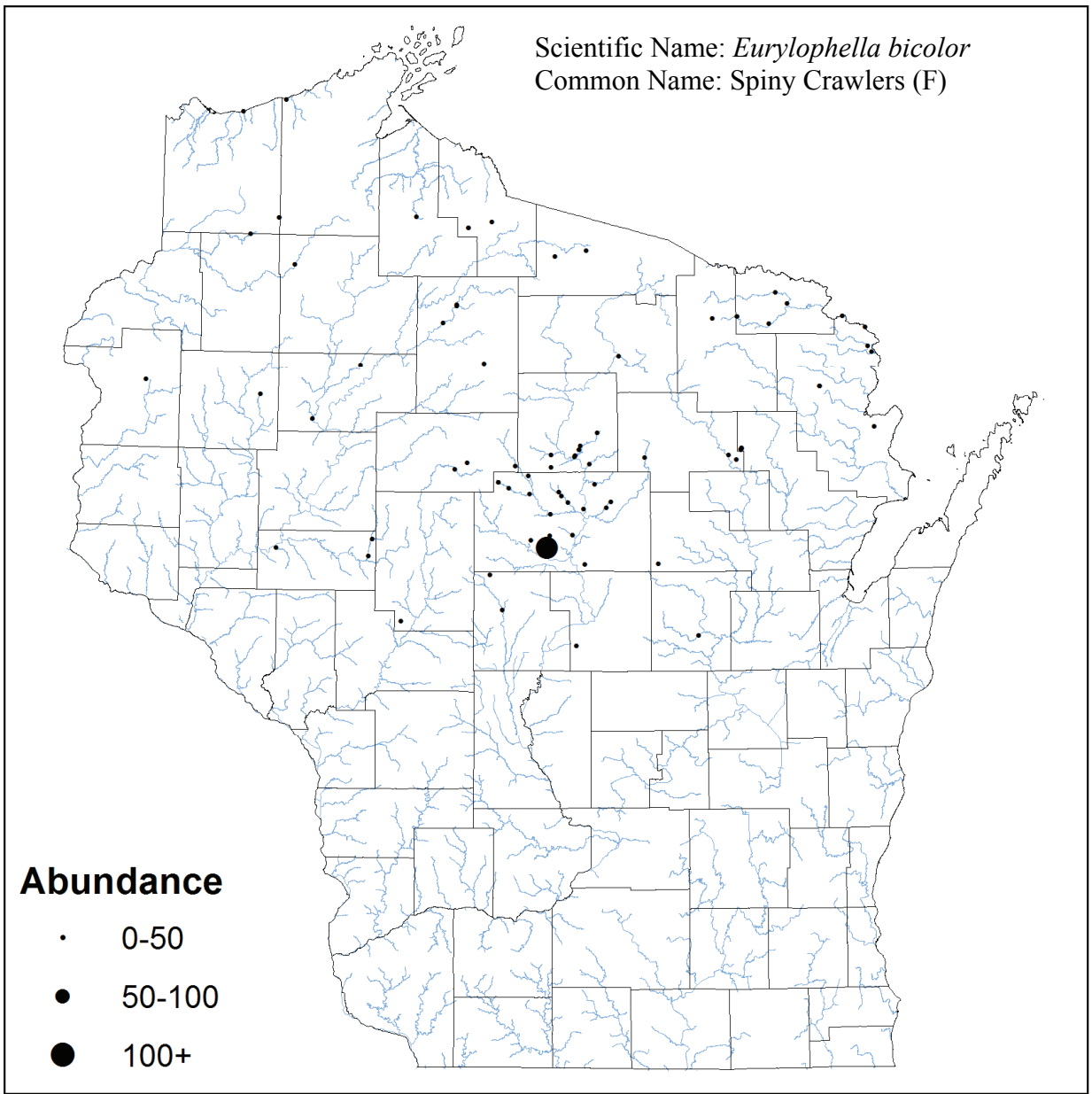
## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemrellidae

Scientific Name: *Eurylophella bicolor*  
 Common Name: Spiny Crawlers (F)

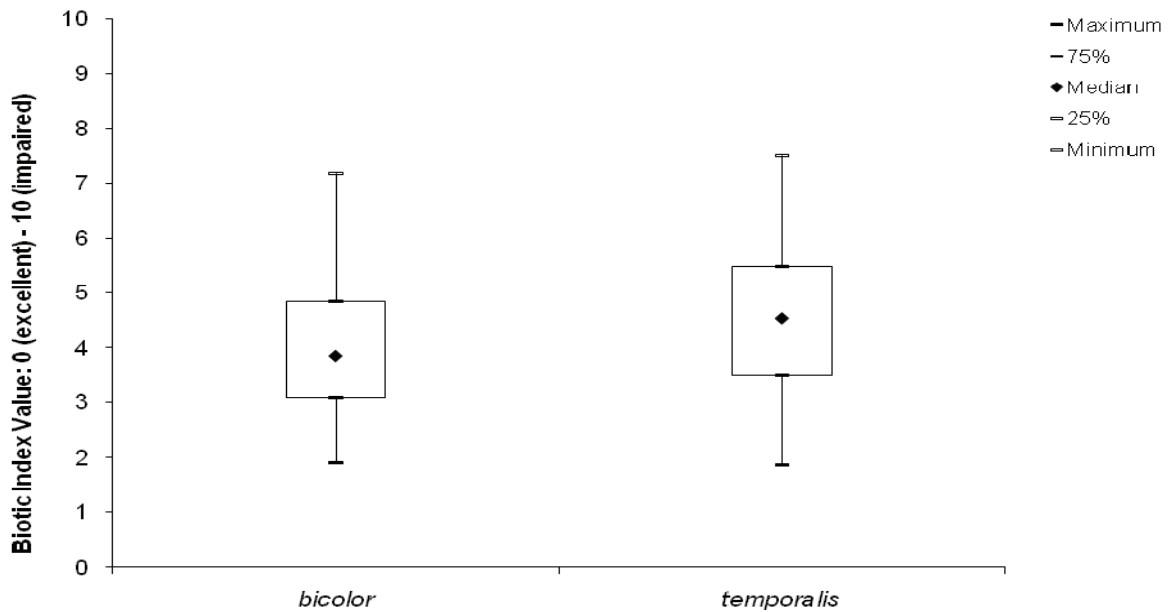
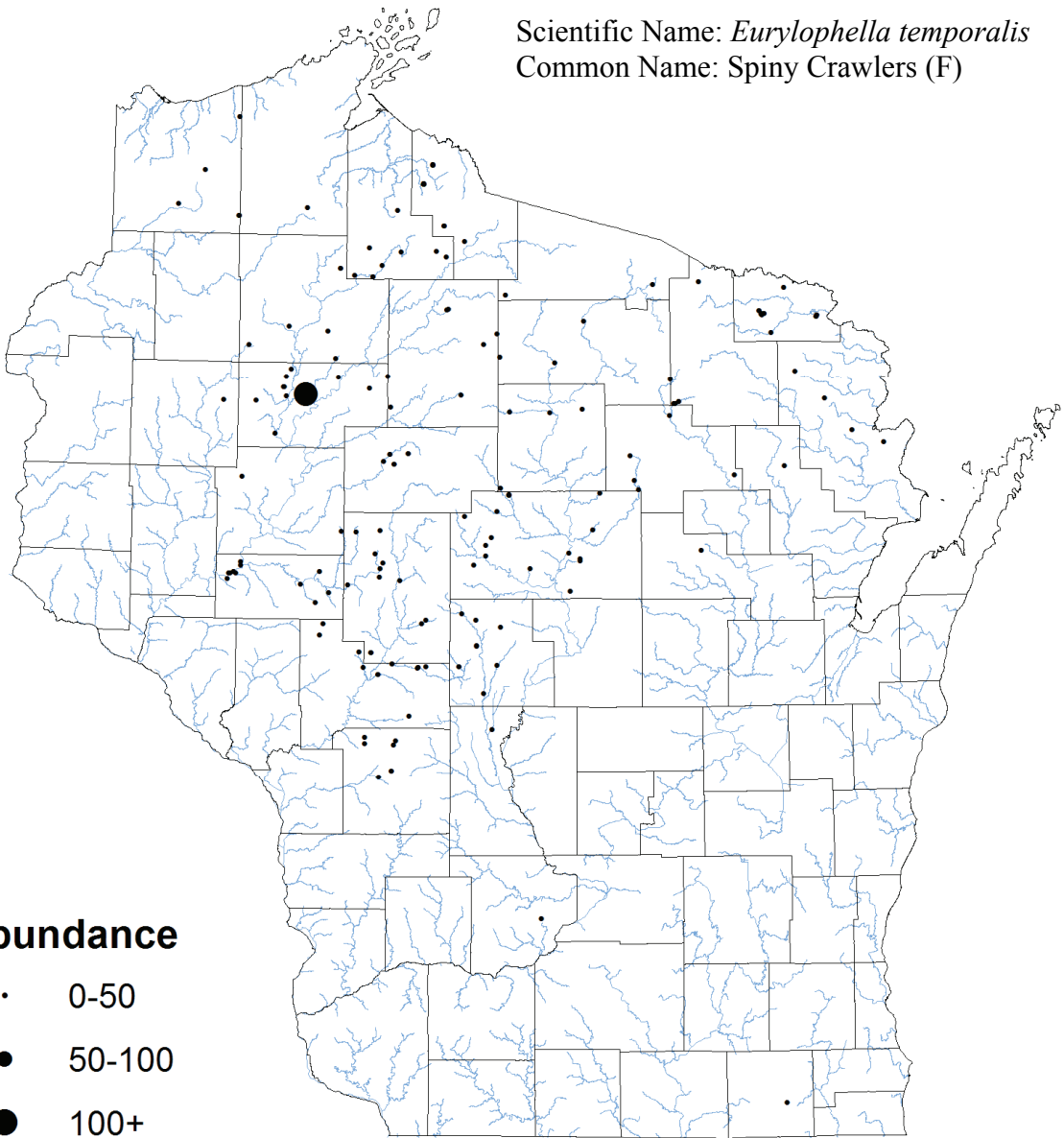


# Ephemeroptera Ephemereididae

Scientific Name: *Eurylophella temporalis*  
 Common Name: Spiny Crawlers (F)

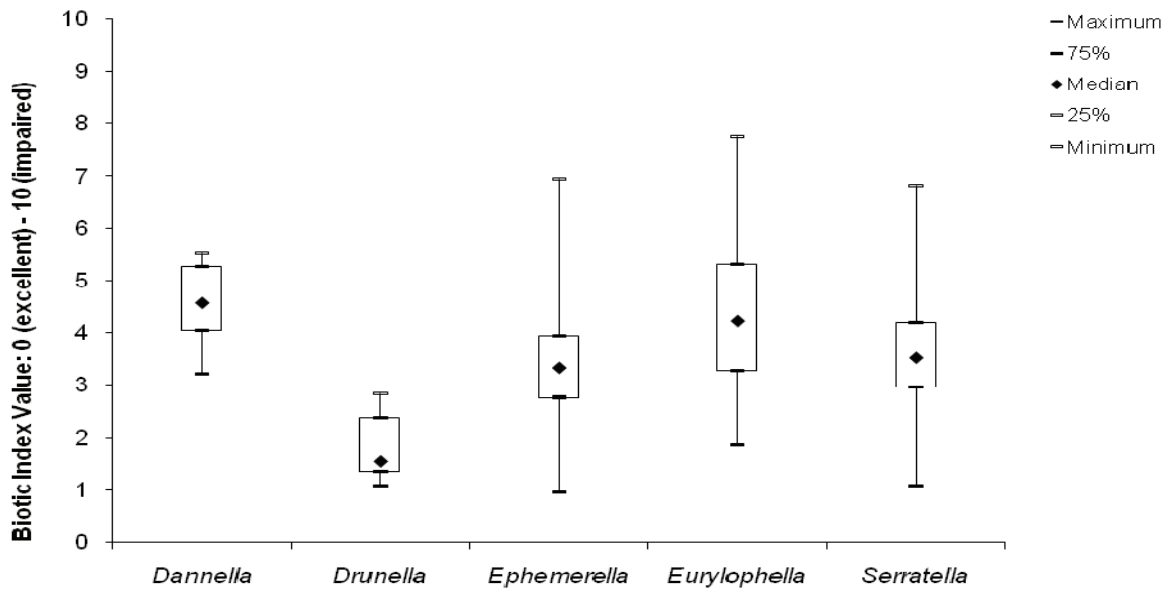
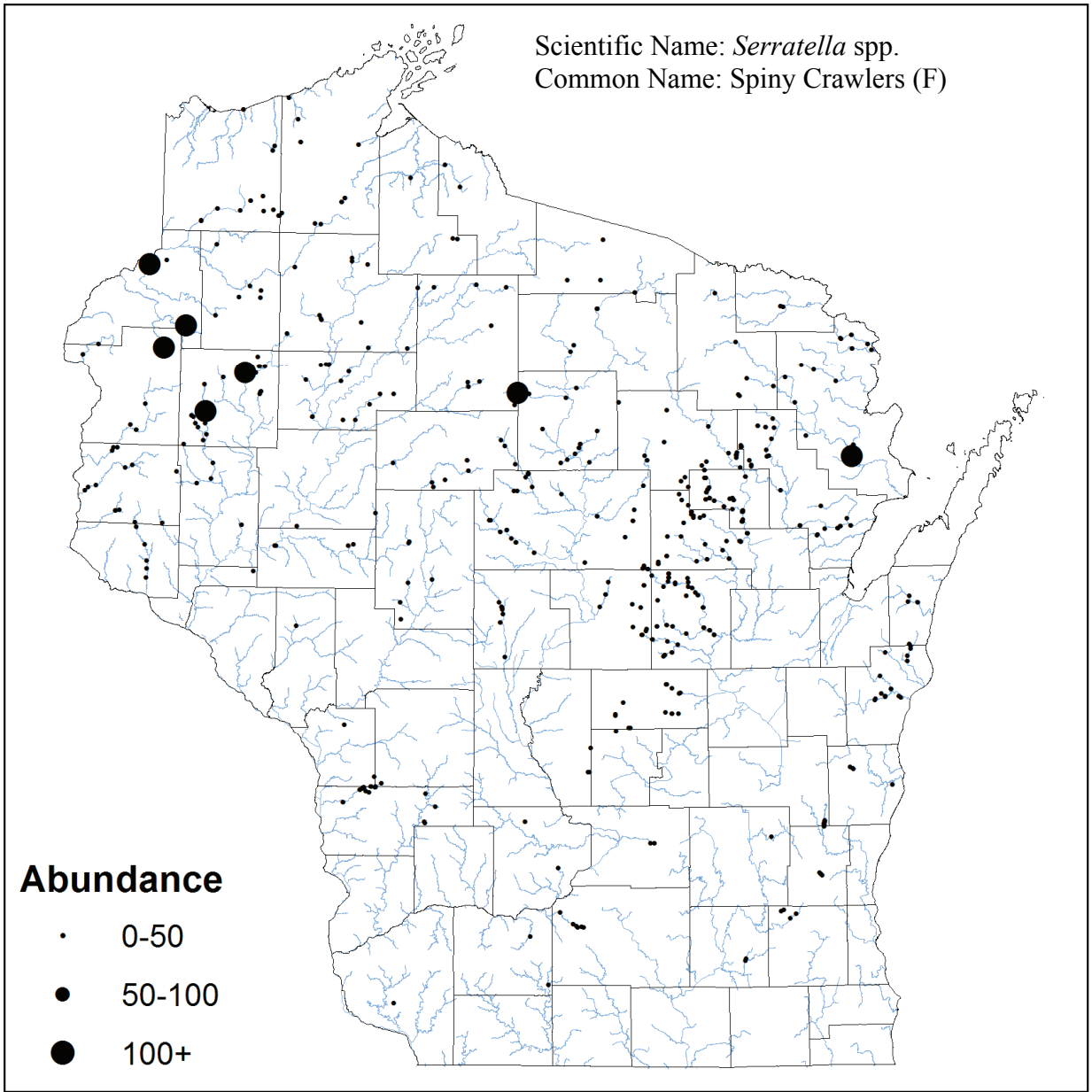
## Abundance

- 0-50
- 50-100
- 100+





# Ephemeroptera Ephemellidae

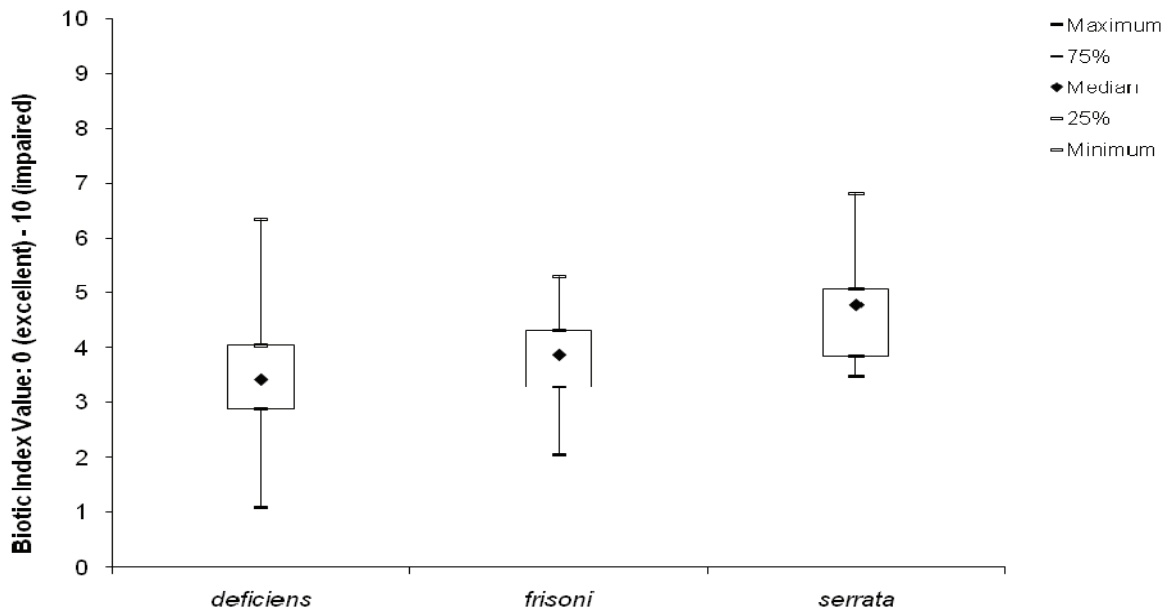
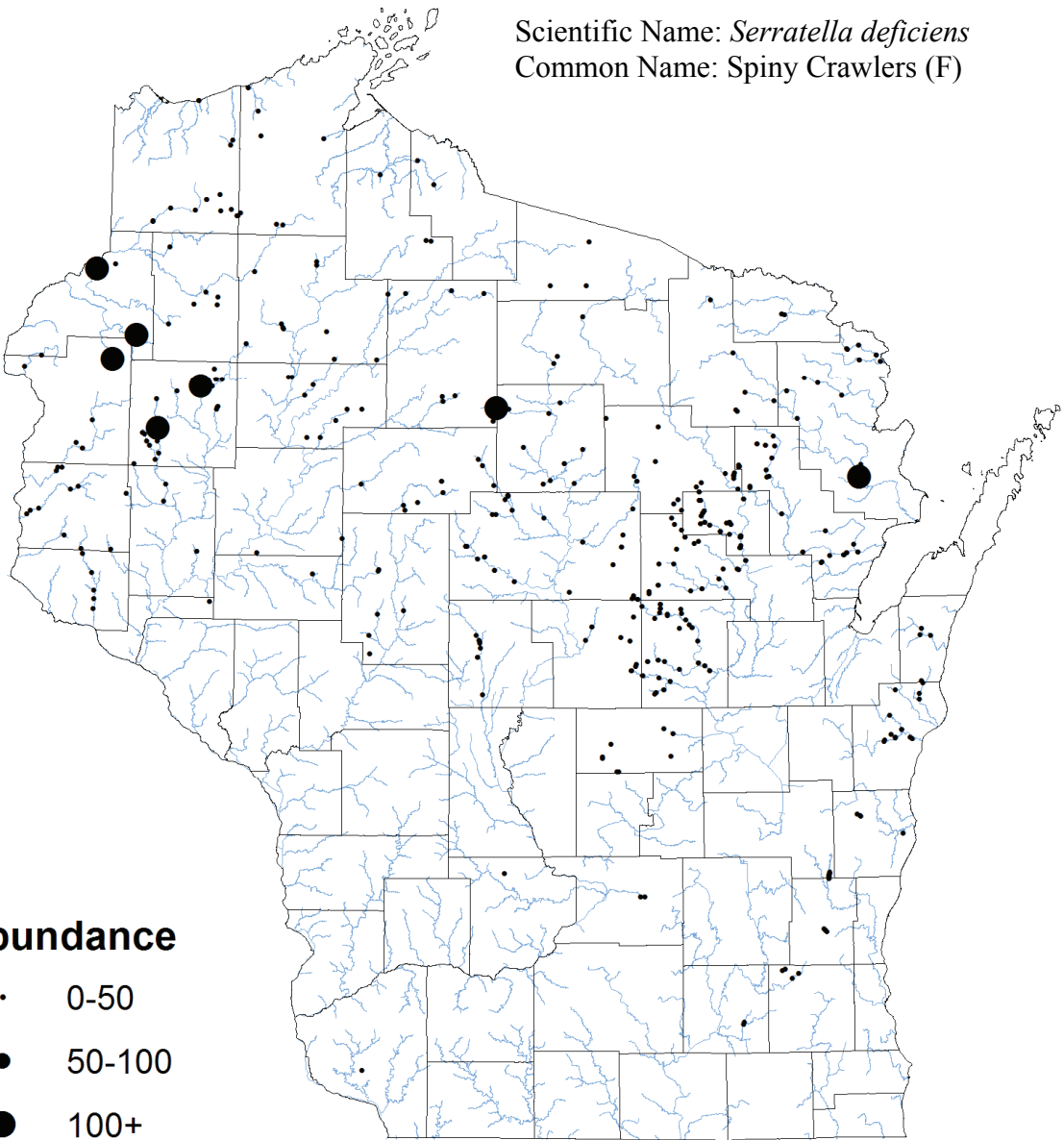


# Ephemeroptera Ephemereilidae

Scientific Name: *Serratella deficiens*  
 Common Name: Spiny Crawlers (F)

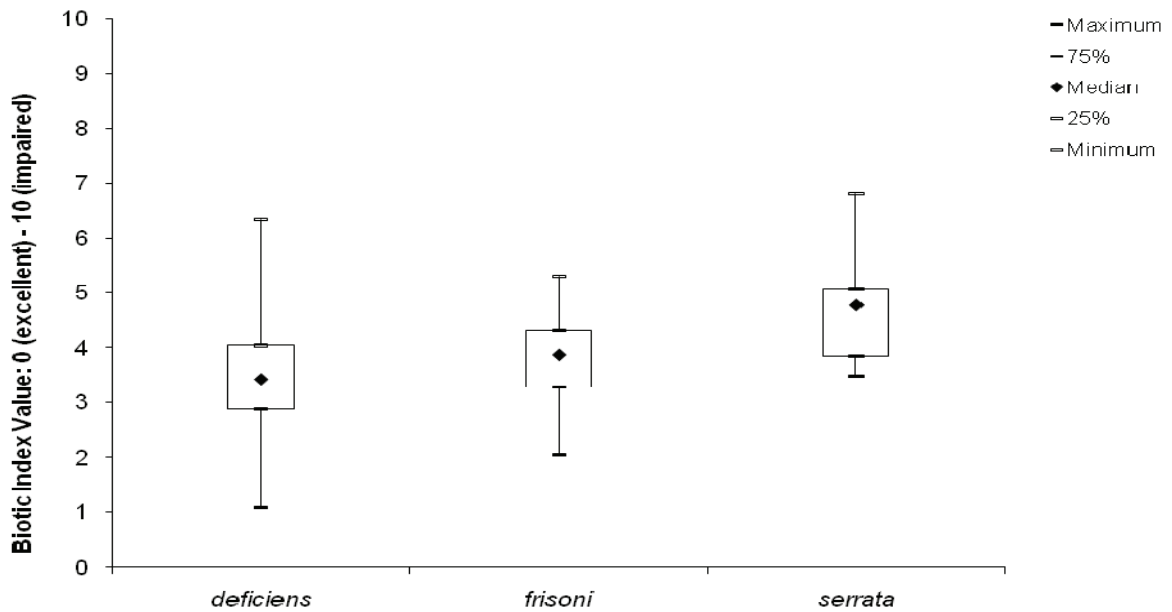
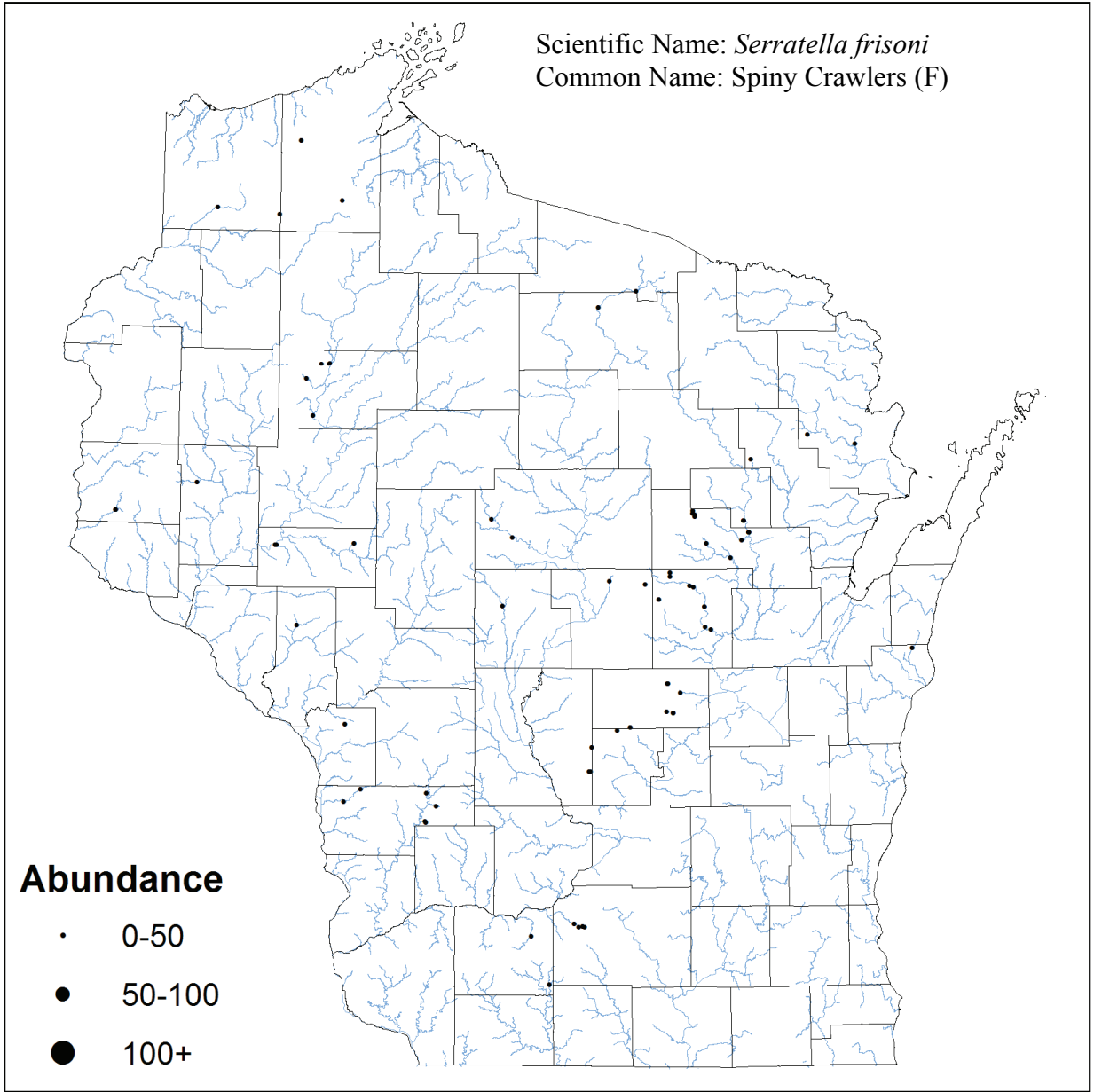
## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemrellidae

Scientific Name: *Serratella frisoni*  
 Common Name: Spiny Crawlers (F)

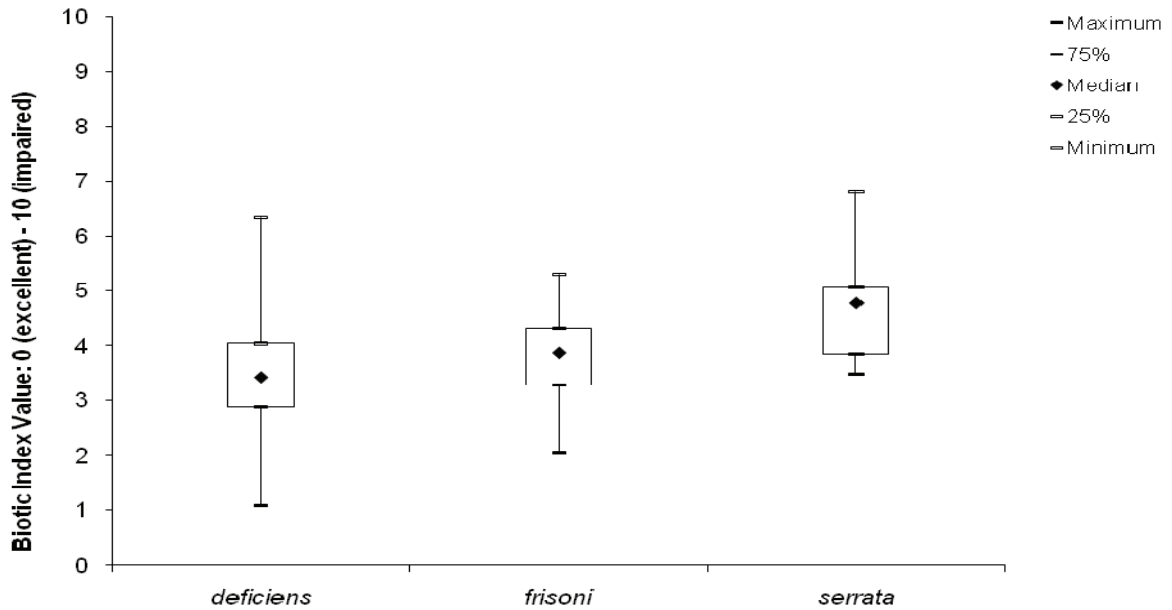
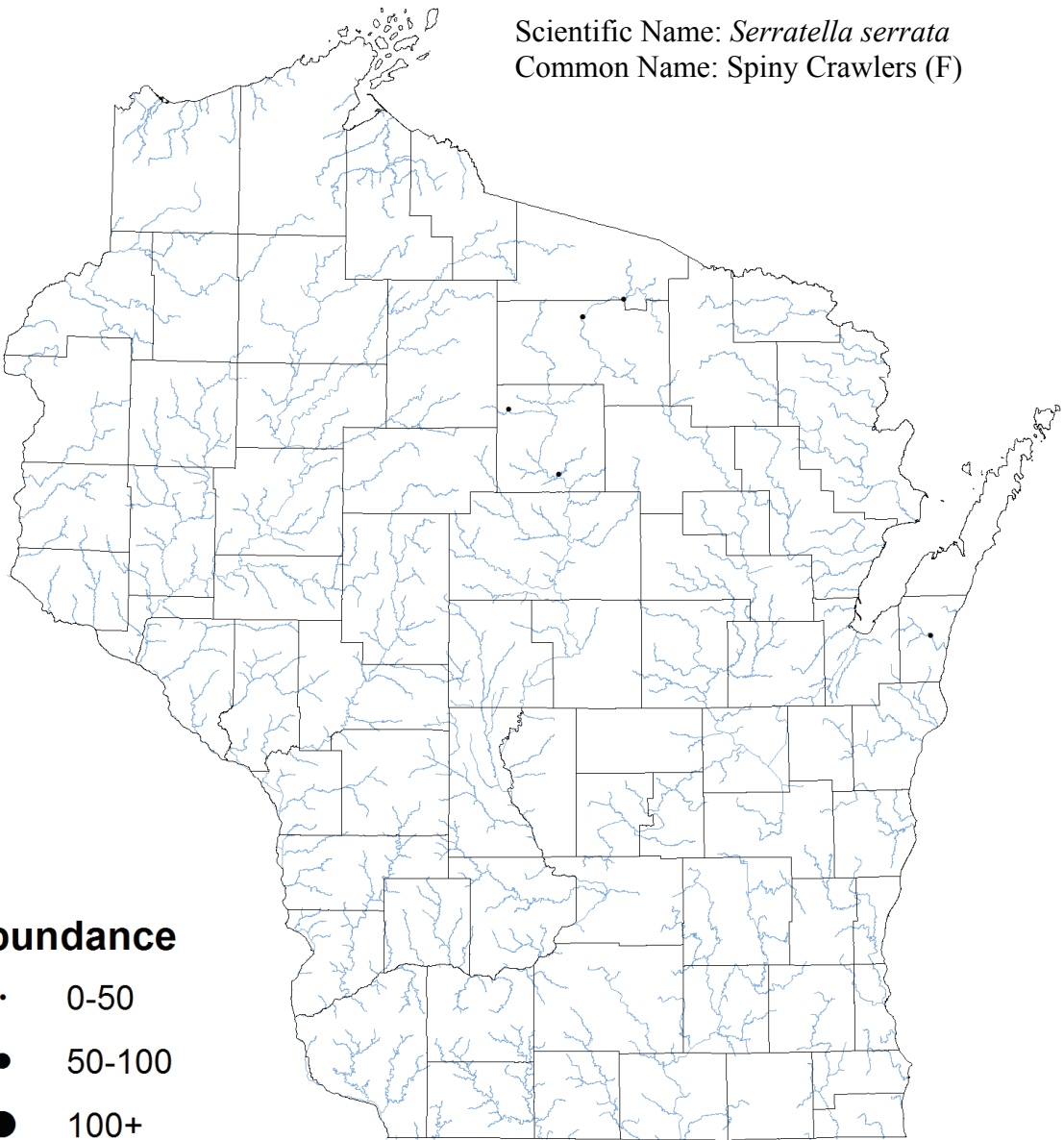


# Ephemeroptera Ephemereilidae

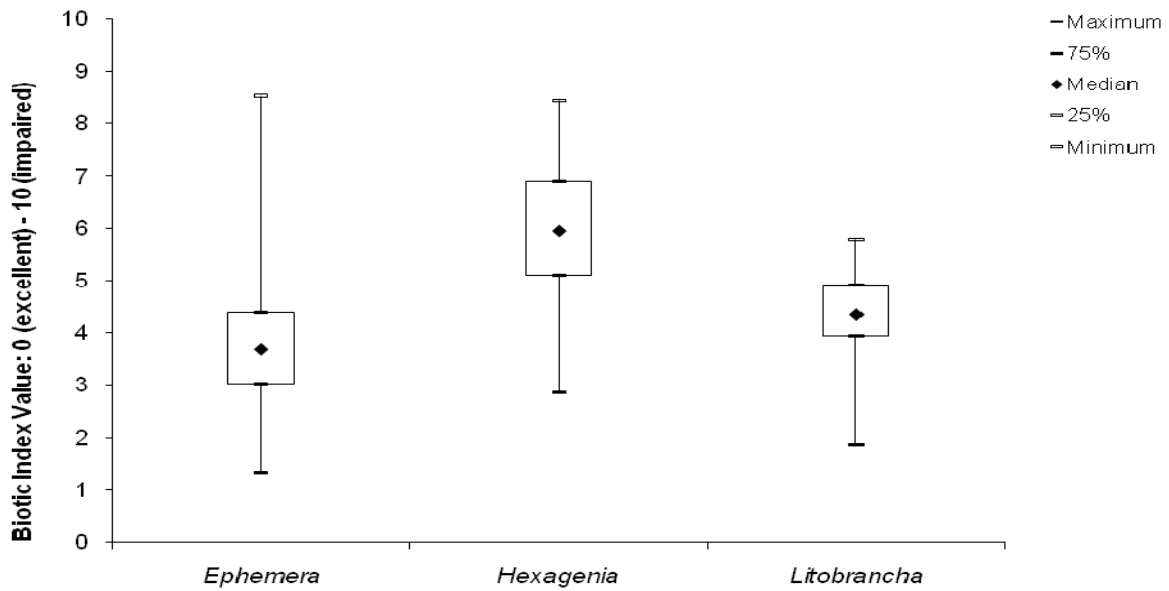
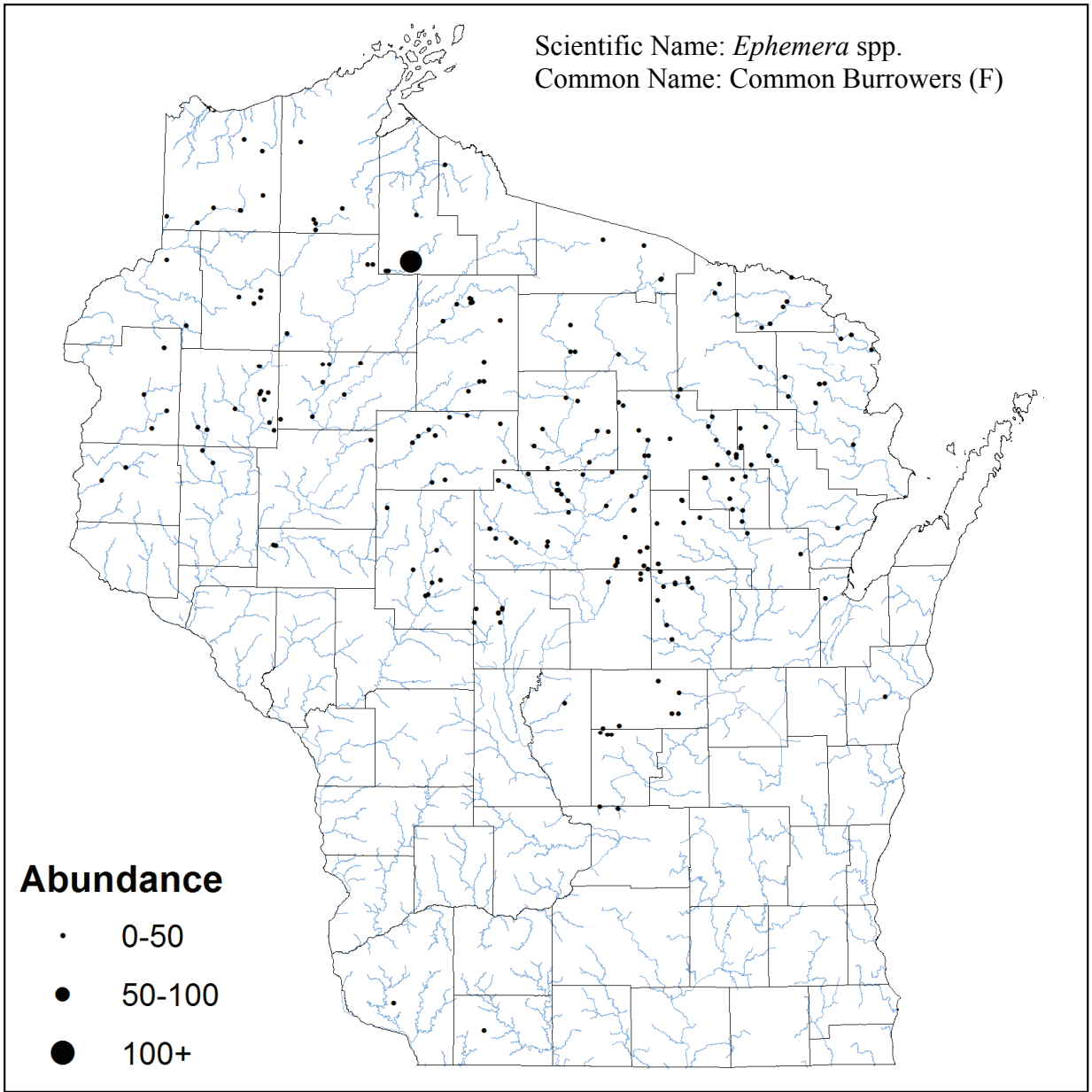
Scientific Name: *Serratella serrata*  
 Common Name: Spiny Crawlers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemeridae

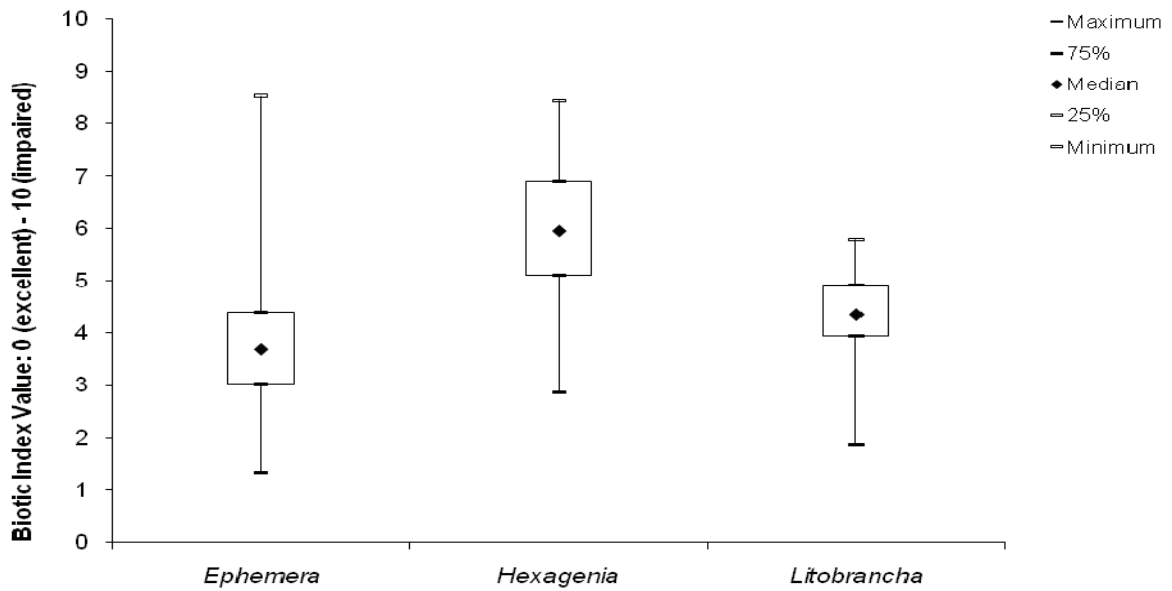
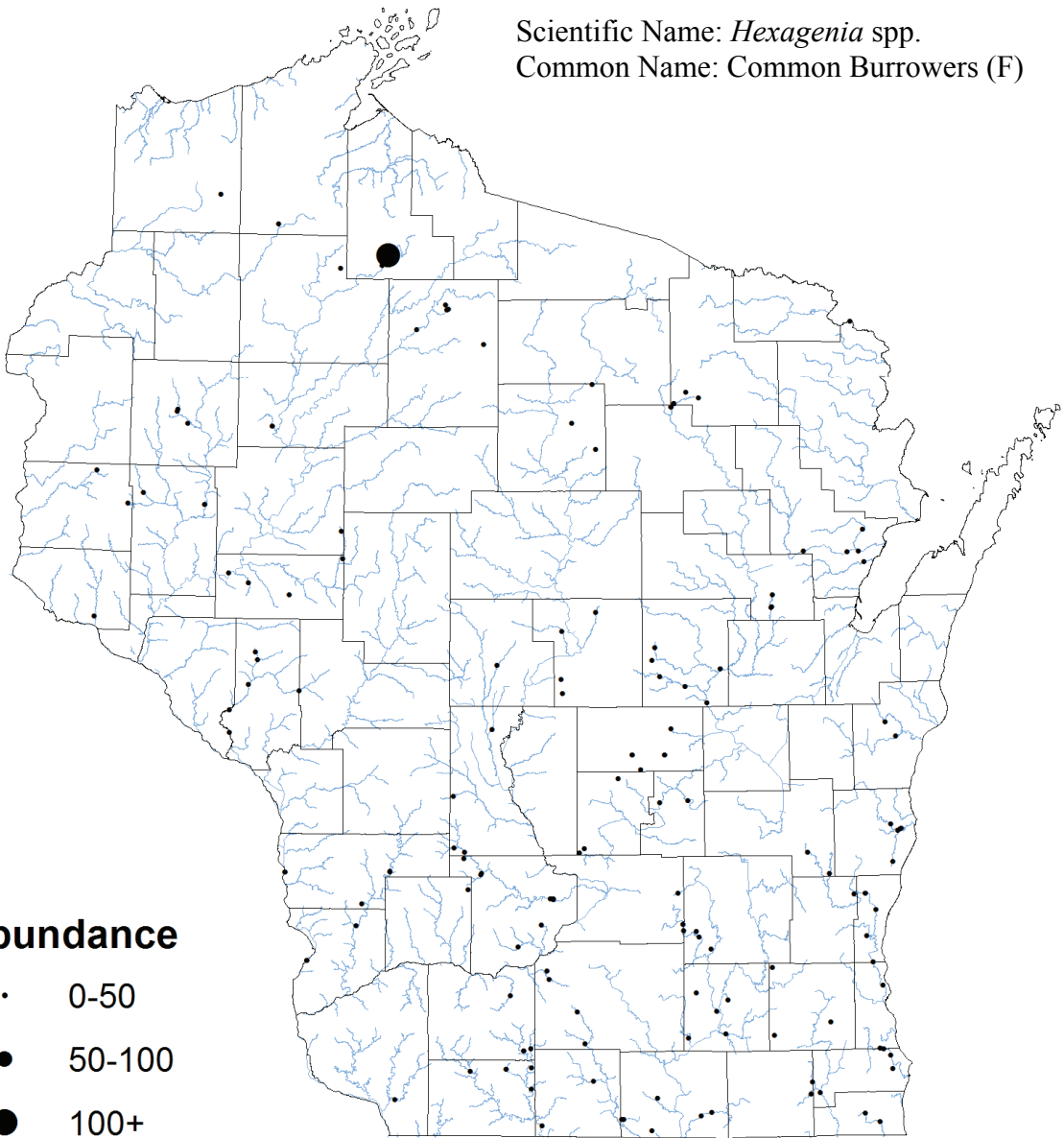


# Ephemeroptera Ephemeridae

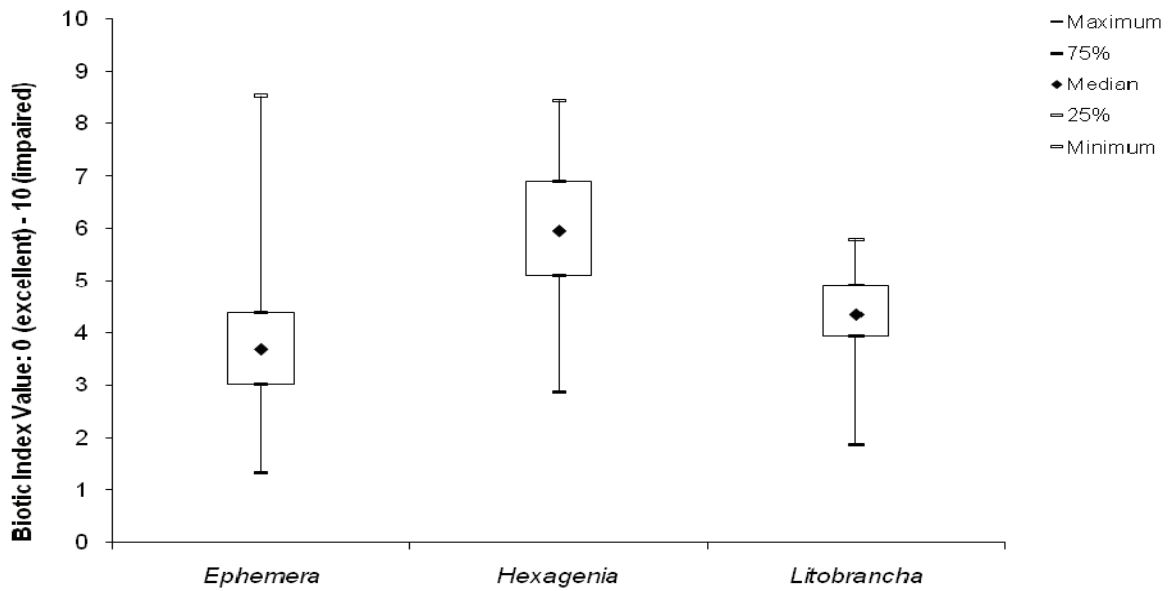
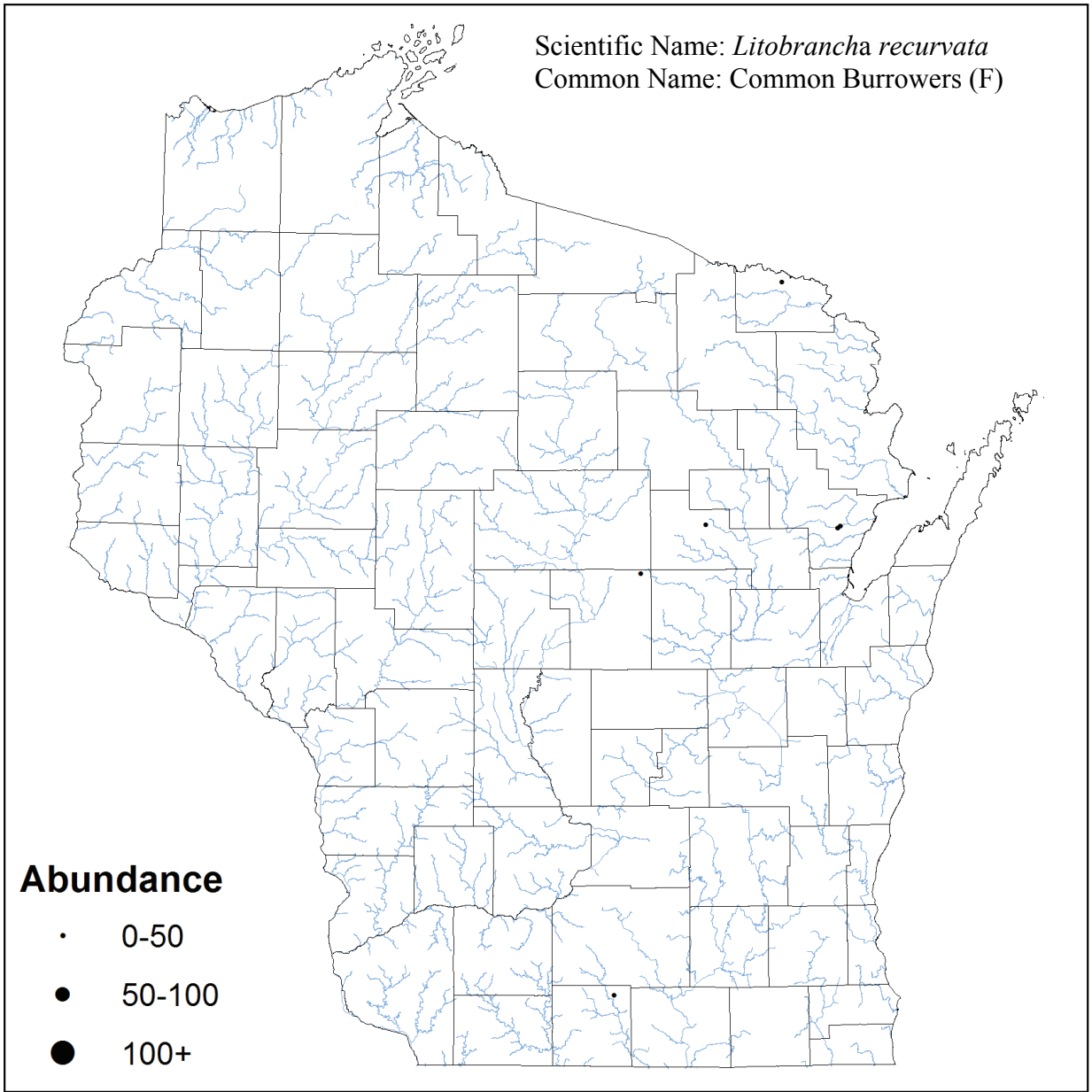
Scientific Name: *Hexagenia* spp.  
 Common Name: Common Burrowers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Ephemeridae

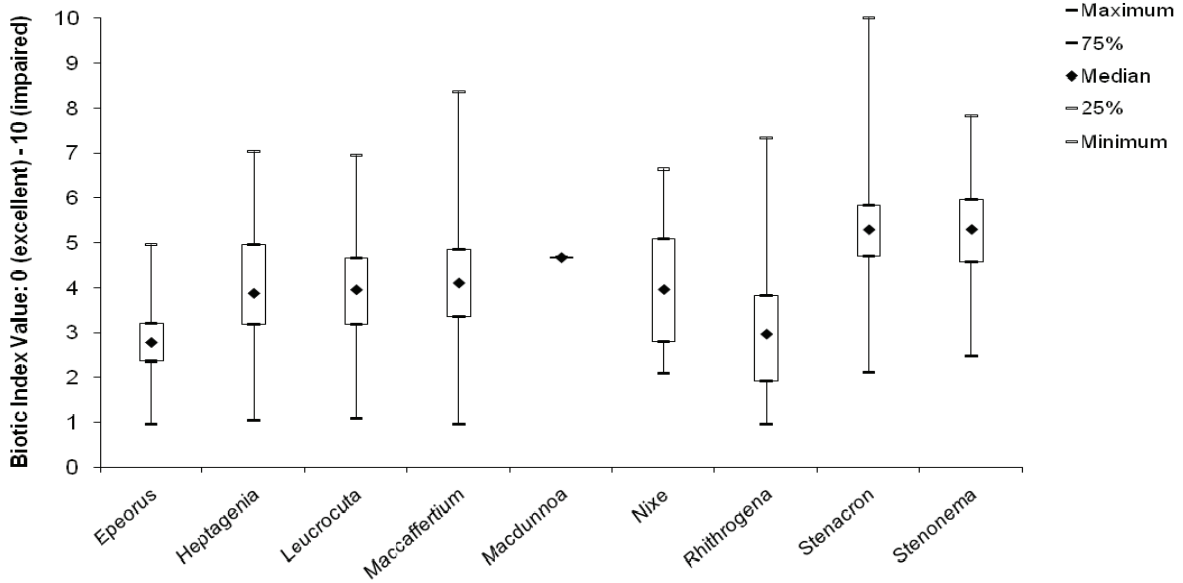
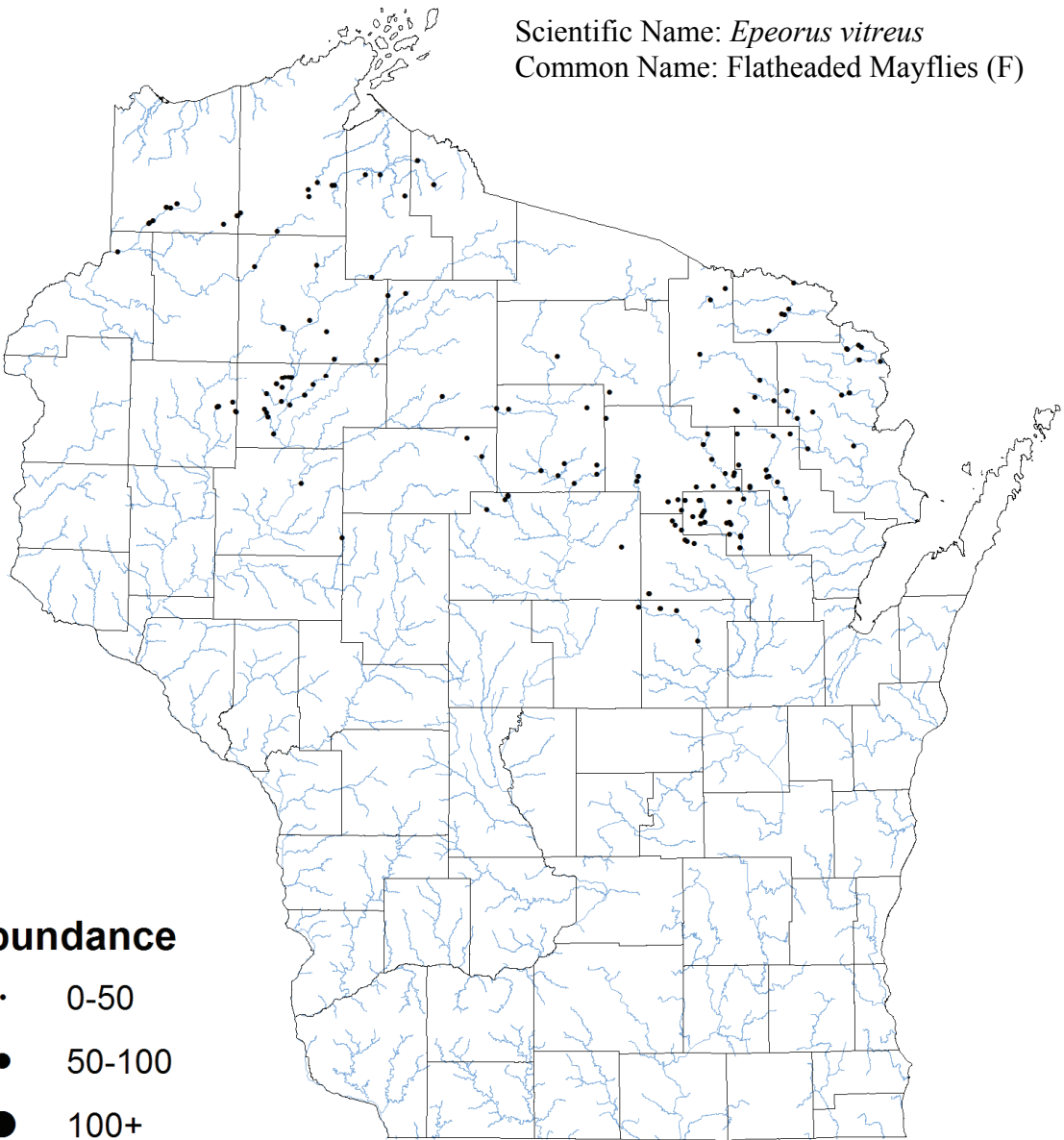


# Ephemeroptera Heptageniidae

Scientific Name: *Epeorus vitreus*  
 Common Name: Flatheaded Mayflies (F)

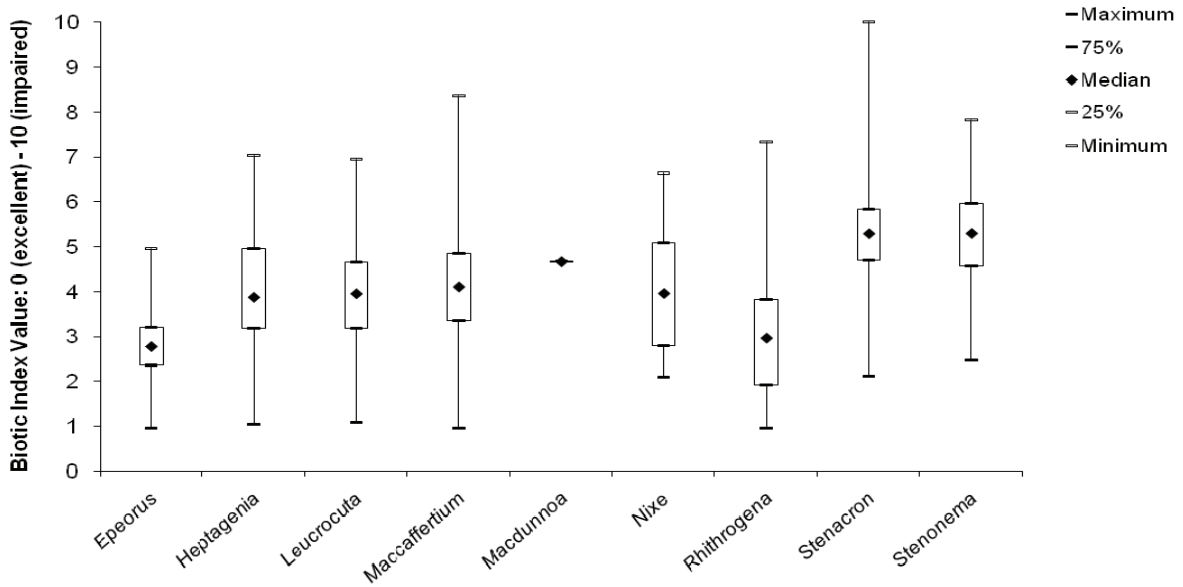
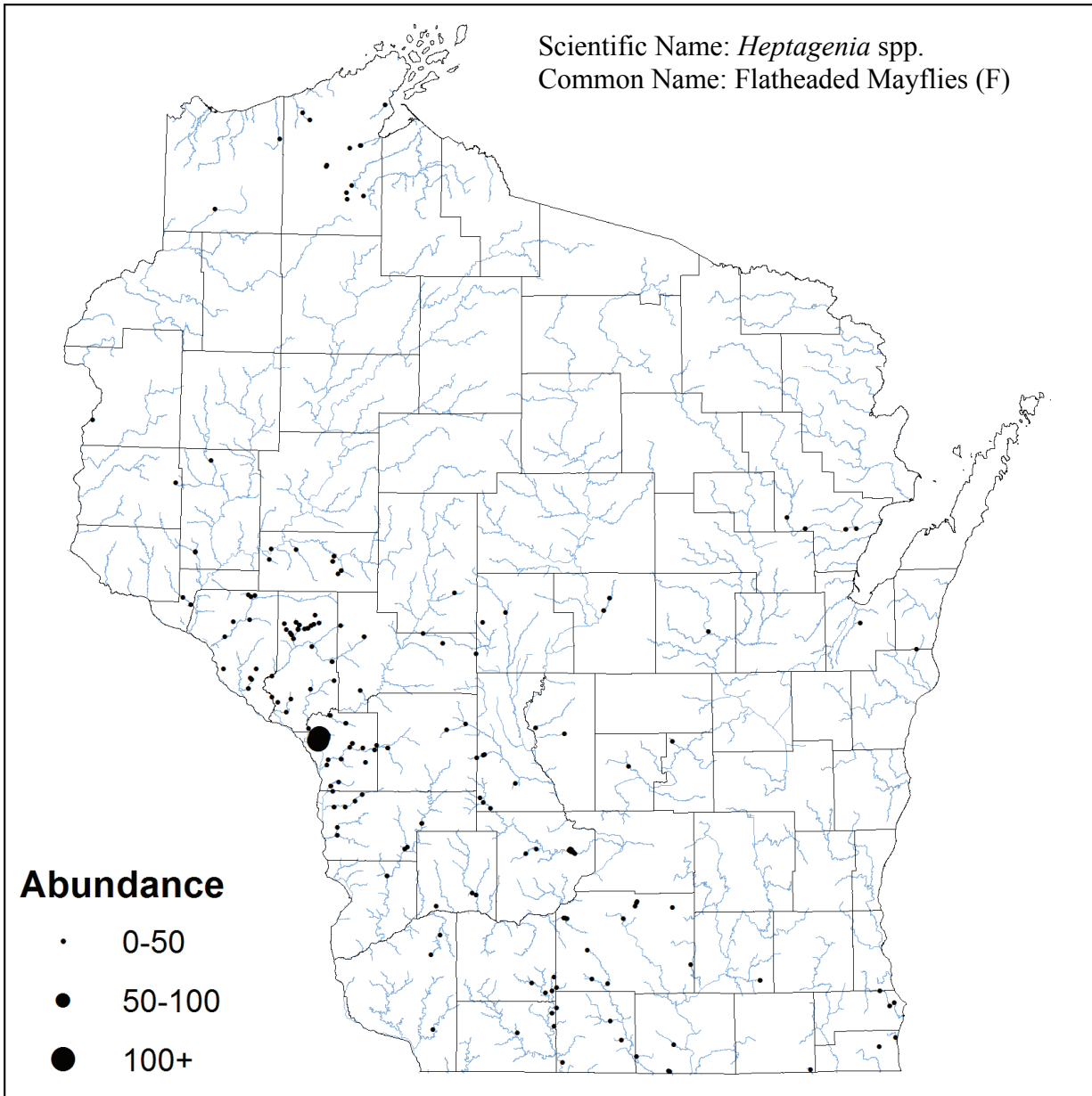
## Abundance

- 0-50
- 50-100
- 100+





# Ephemeroptera Heptageniidae

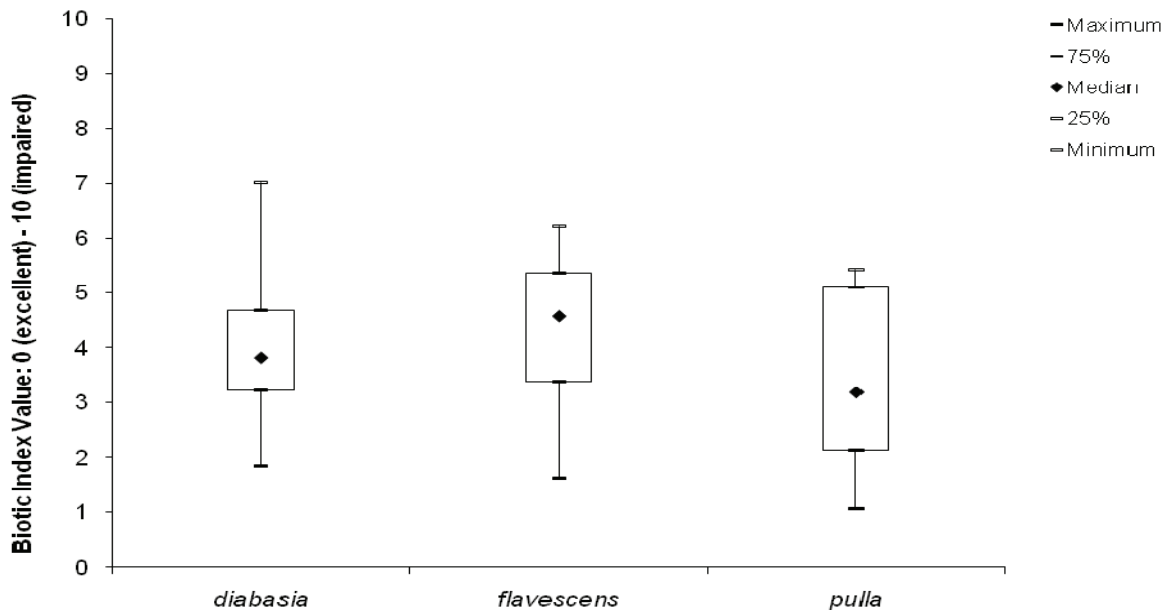
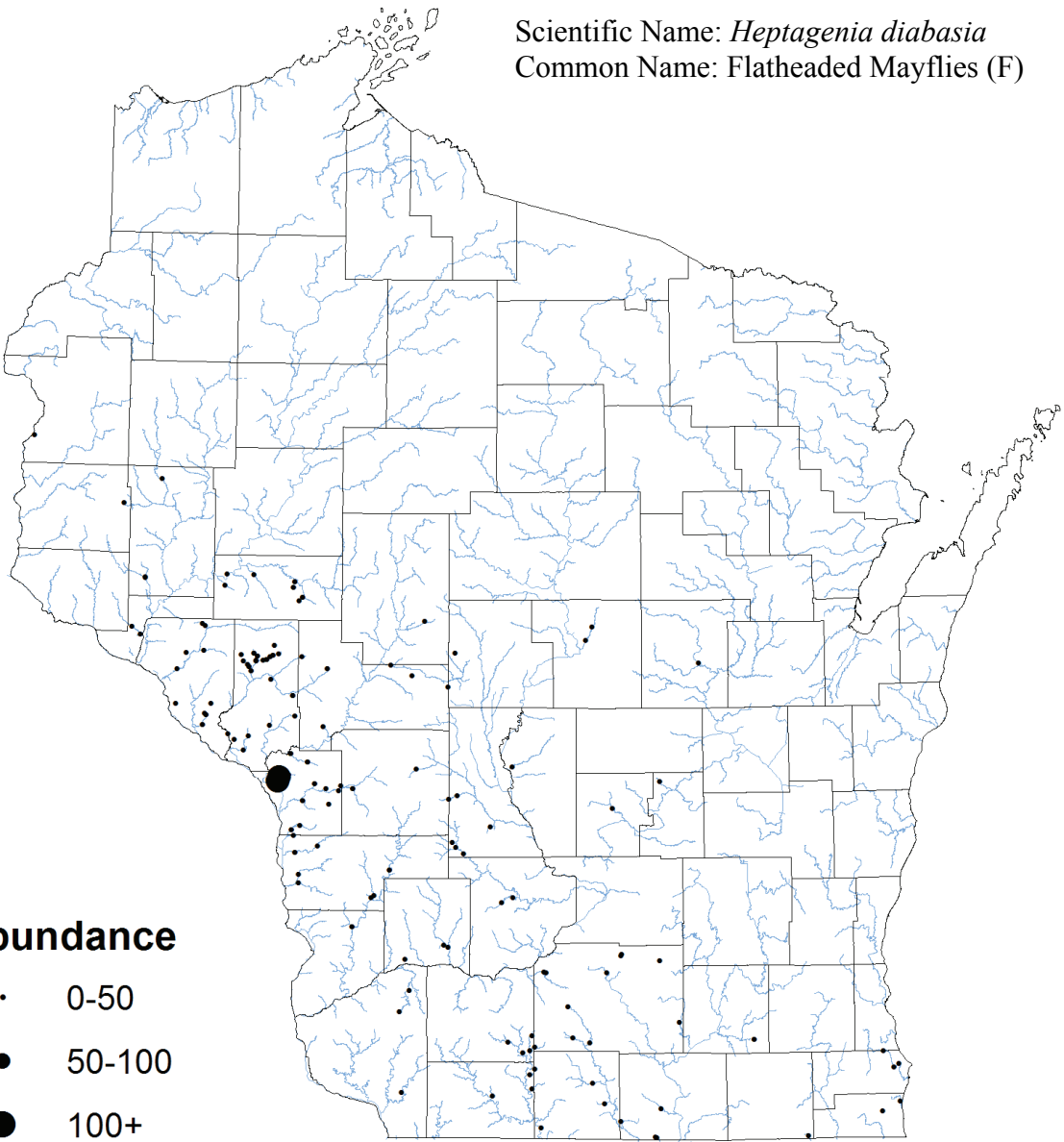


# Ephemeroptera Heptageniidae

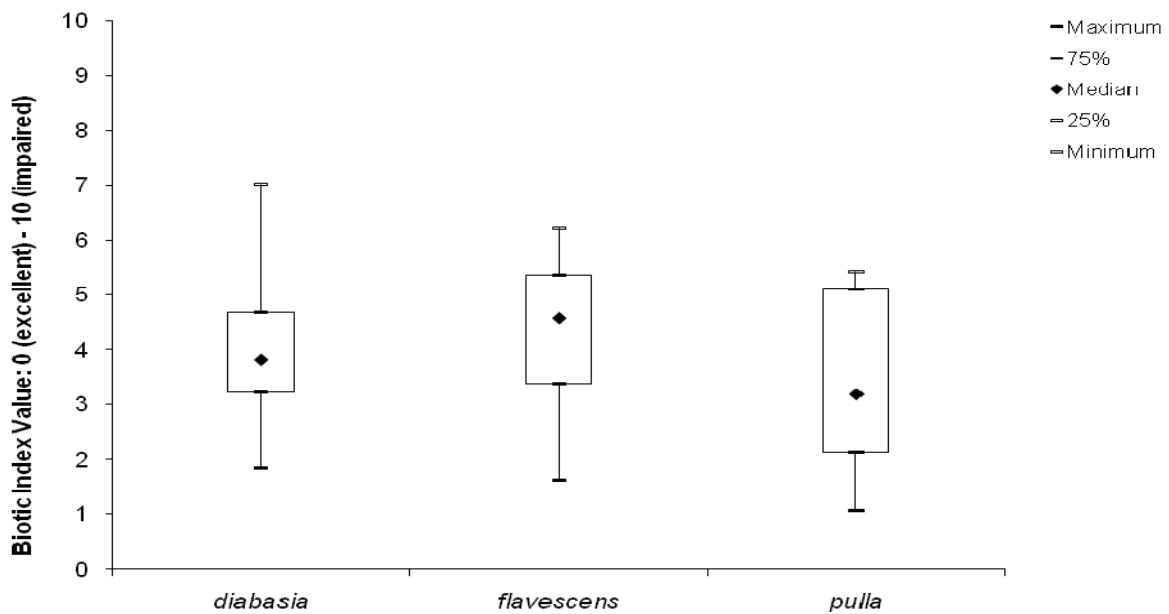
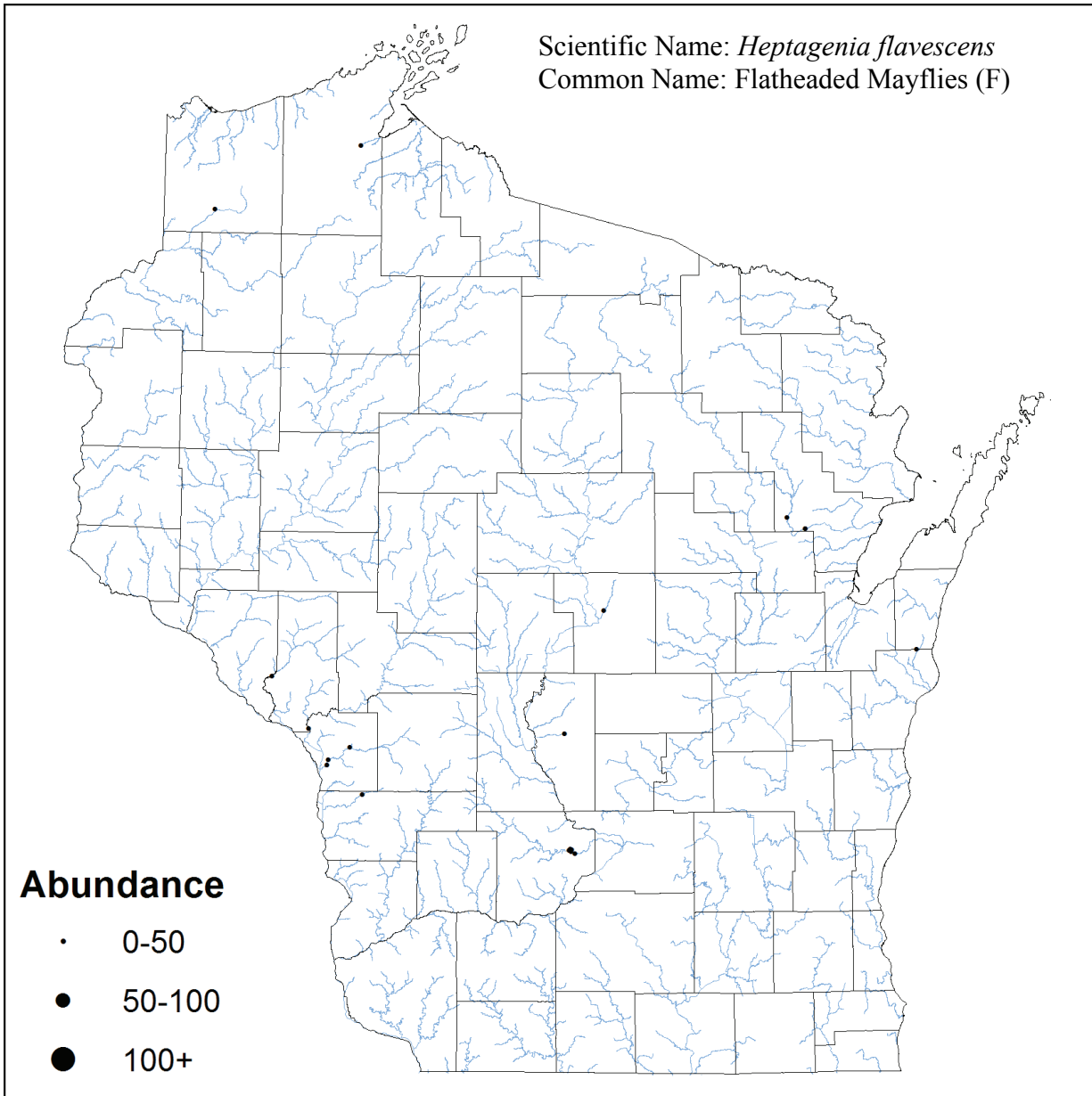
Scientific Name: *Heptagenia diabasia*  
 Common Name: Flatheaded Mayflies (F)

## Abundance

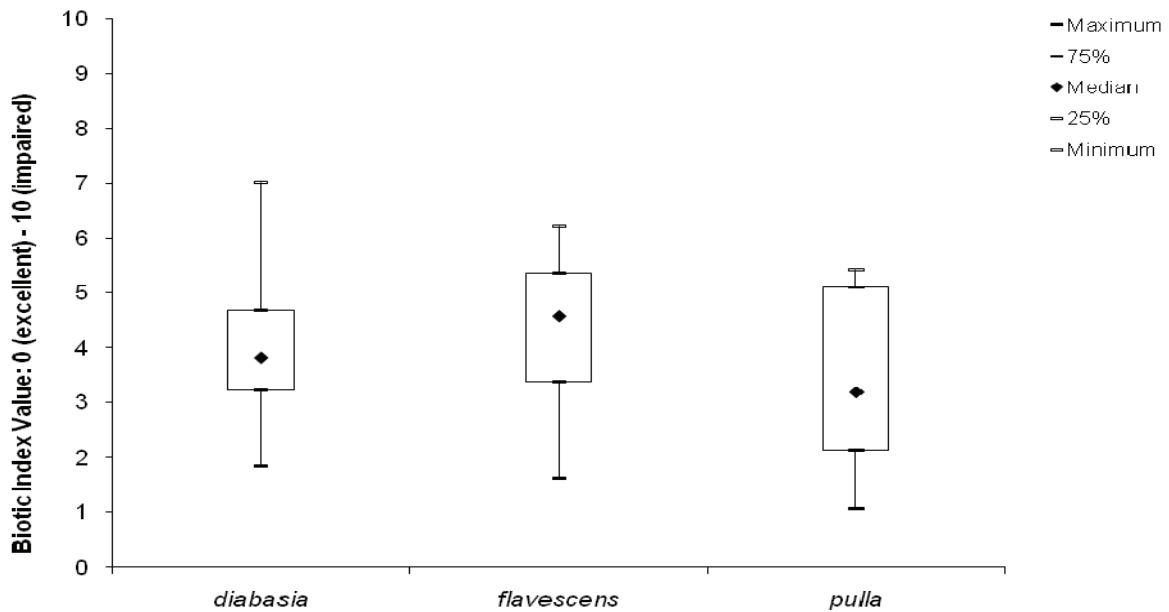
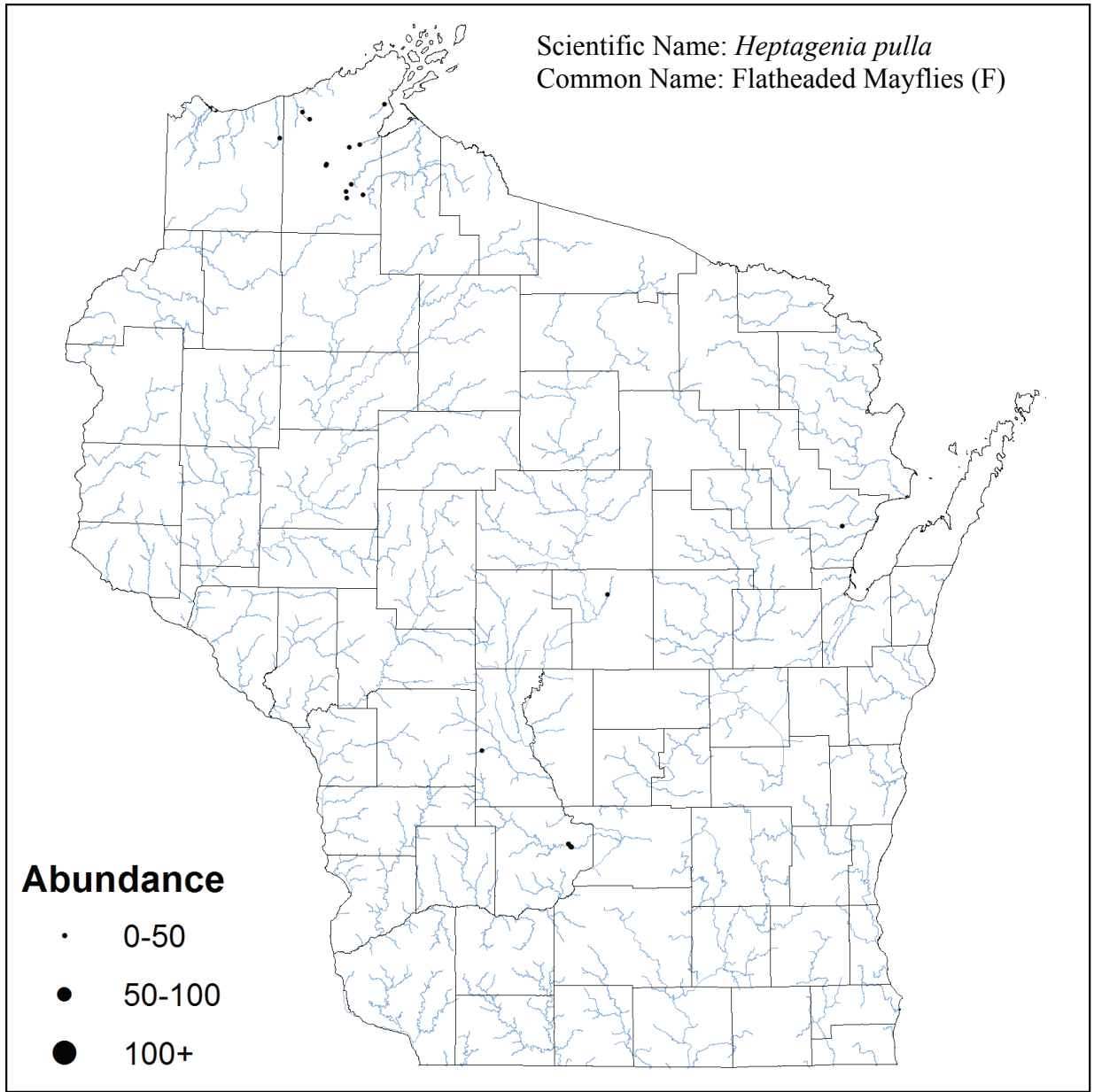
- 0-50
- 50-100
- 100+



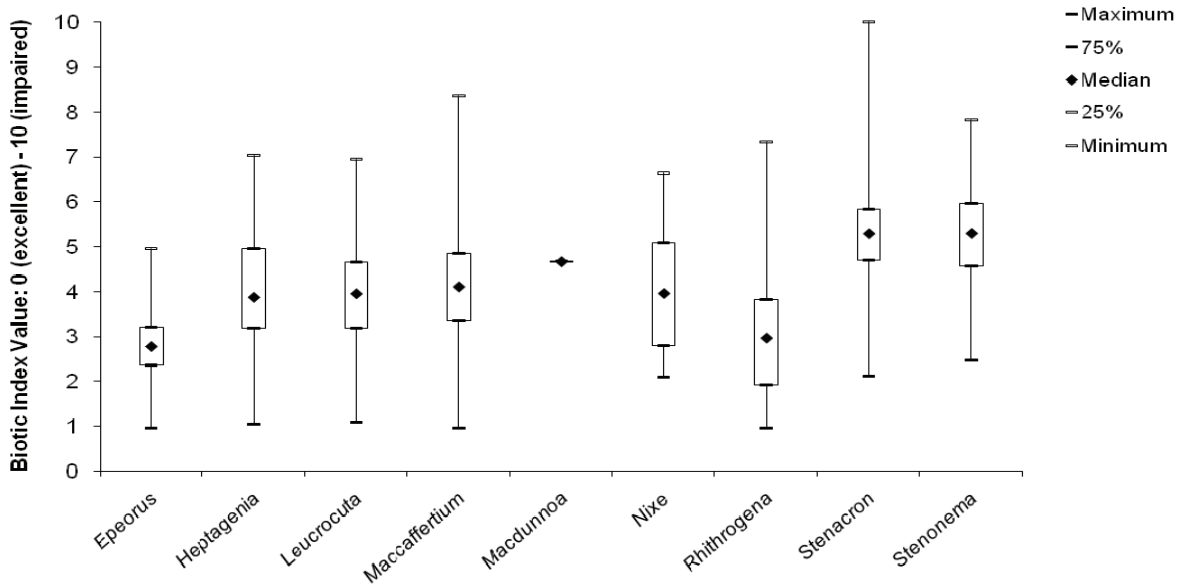
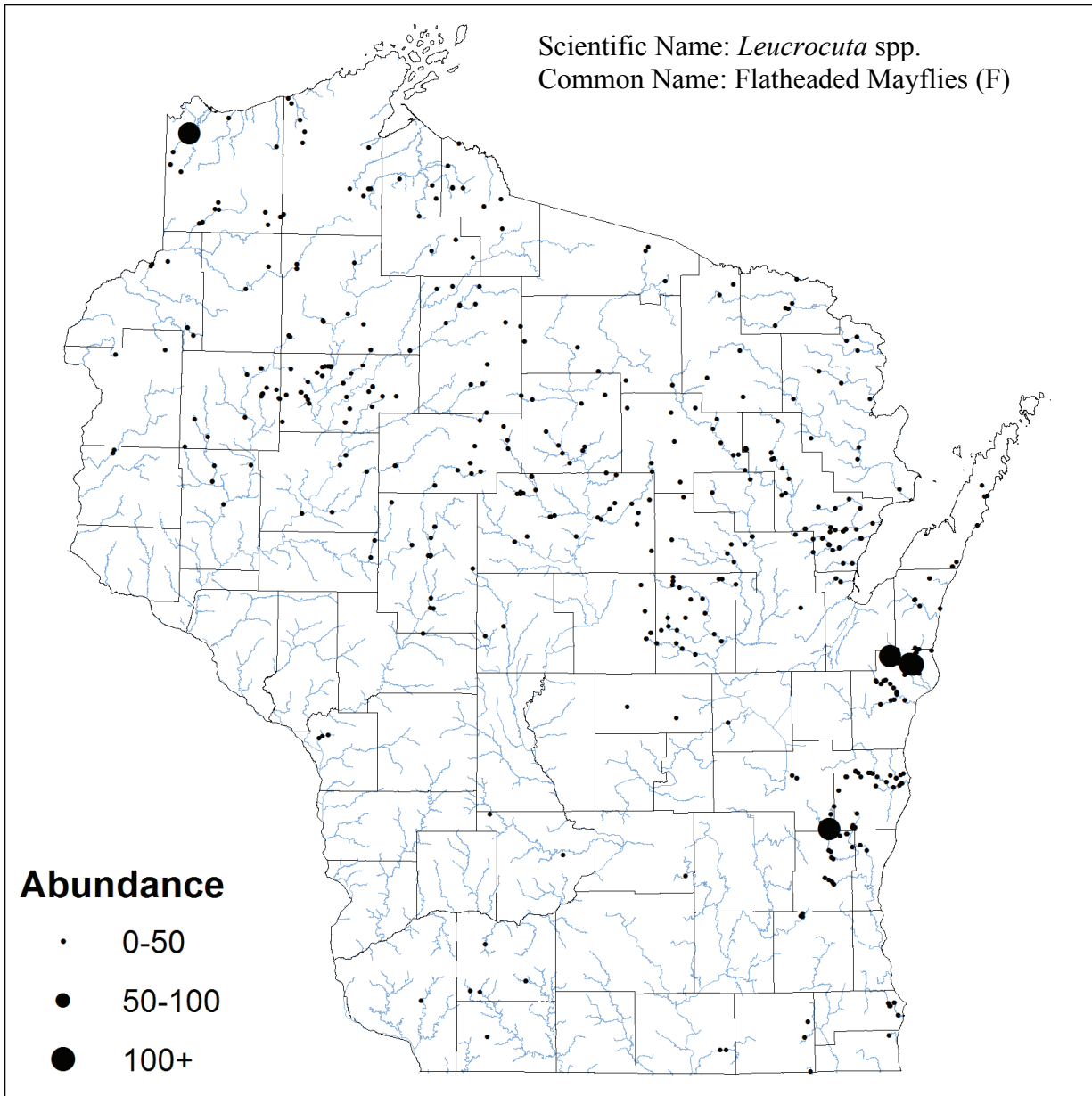
# Ephemeroptera Heptageniidae



# Ephemeroptera Heptageniidae



# Ephemeroptera Heptageniidae

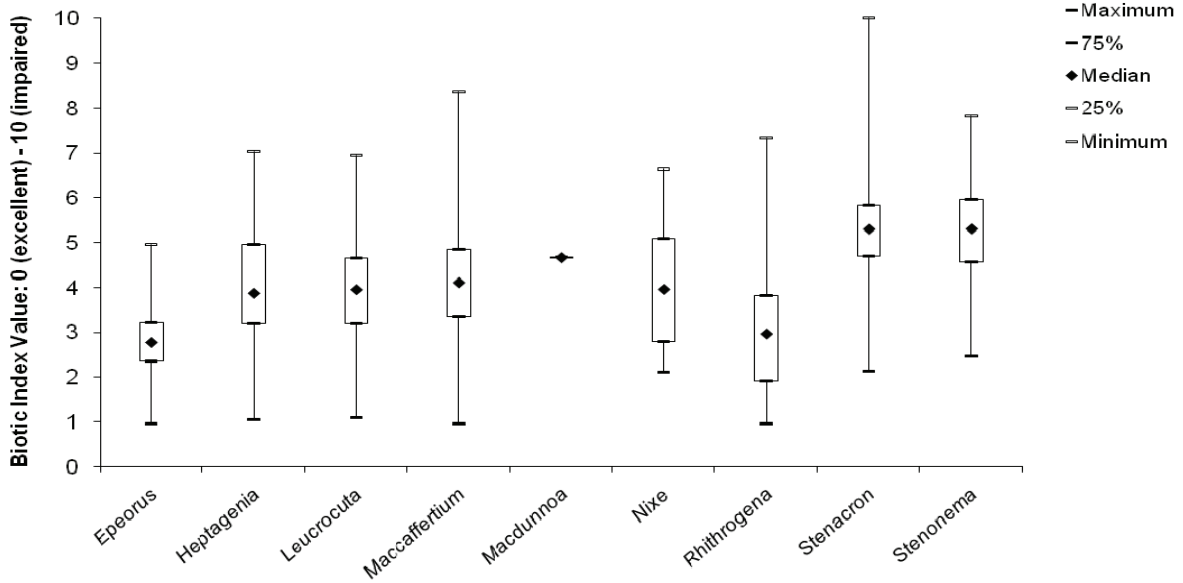
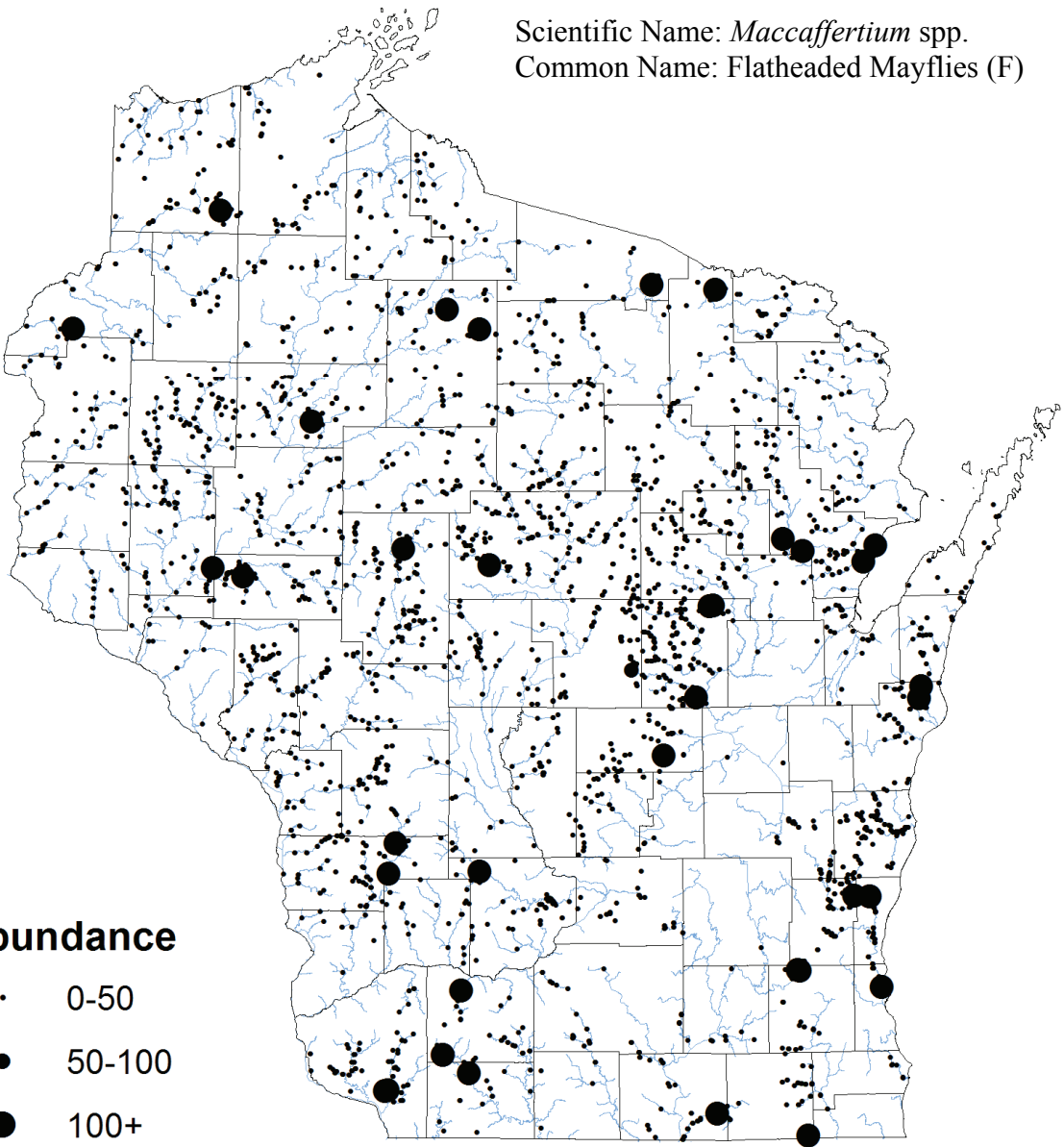


# Ephemeroptera Heptageniidae

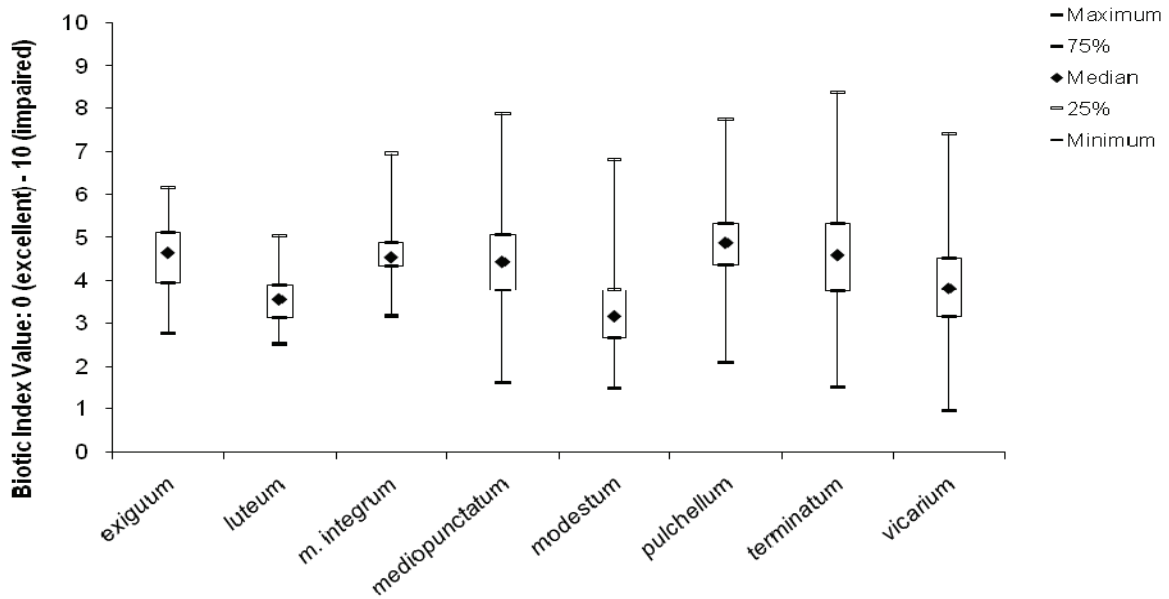
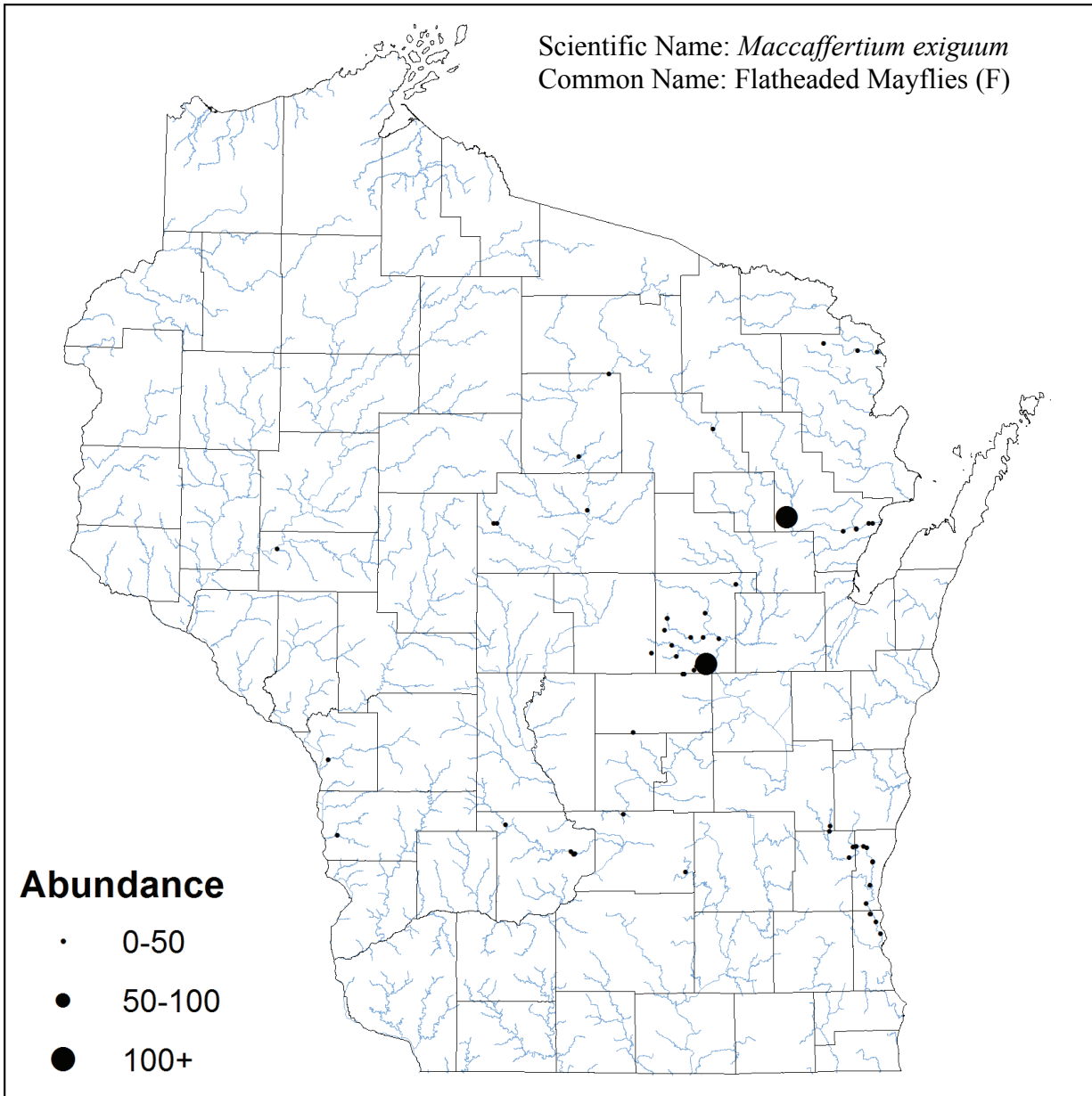
Scientific Name: *Maccaffertium* spp.  
 Common Name: Flatheaded Mayflies (F)

## Abundance

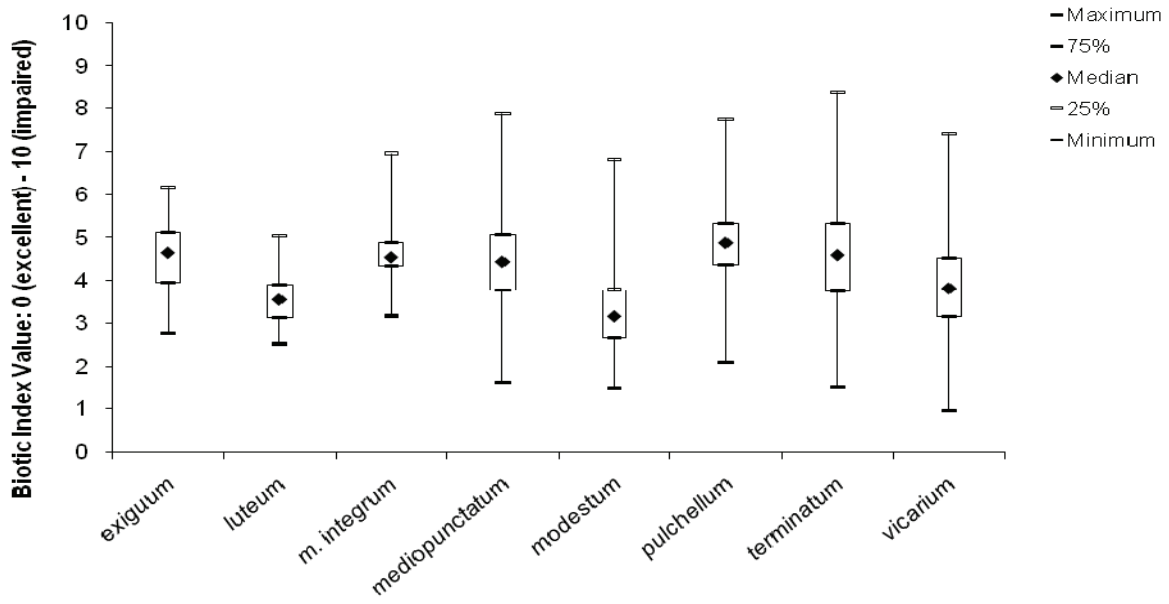
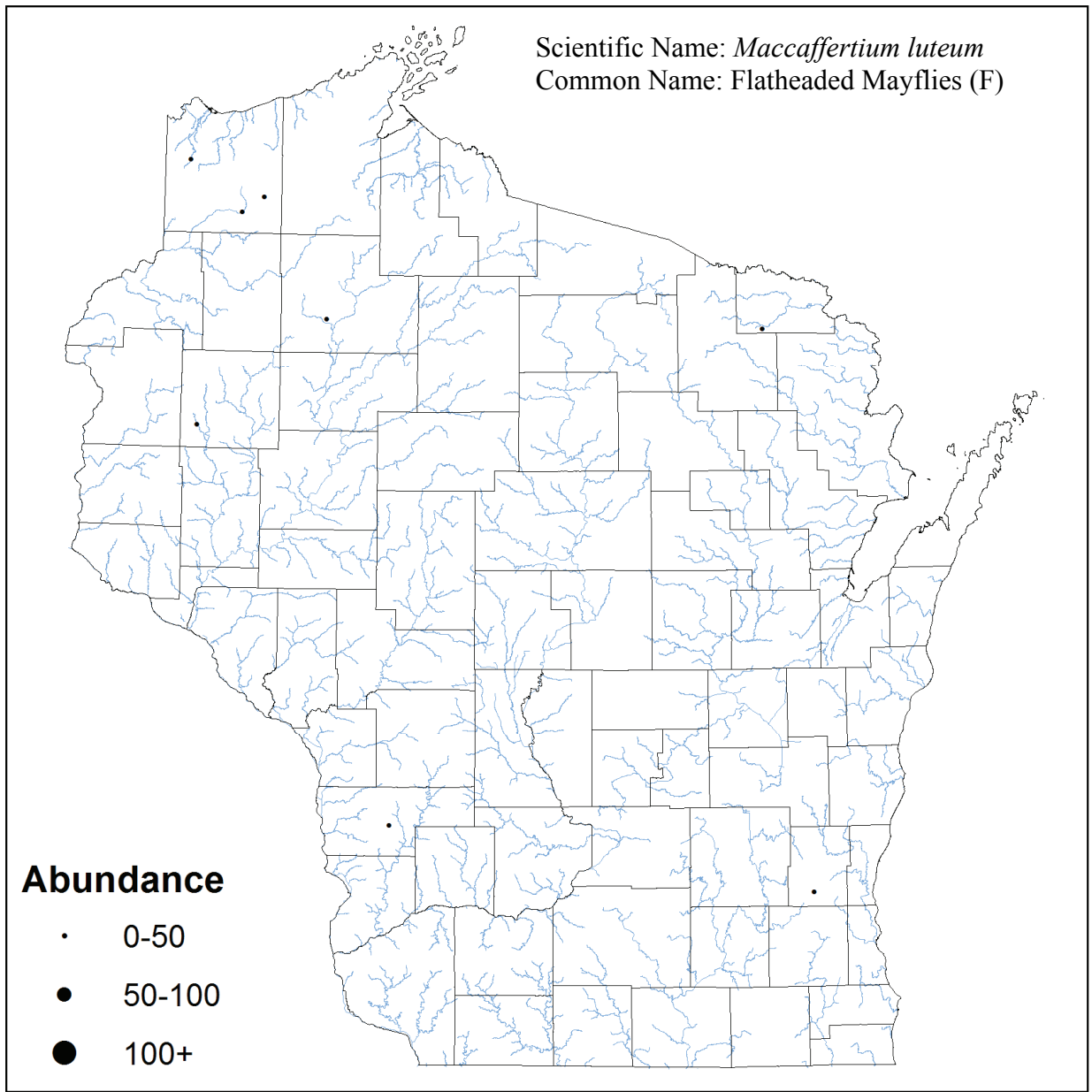
- 0-50
- 50-100
- 100+



# Ephemeroptera Heptageniidae

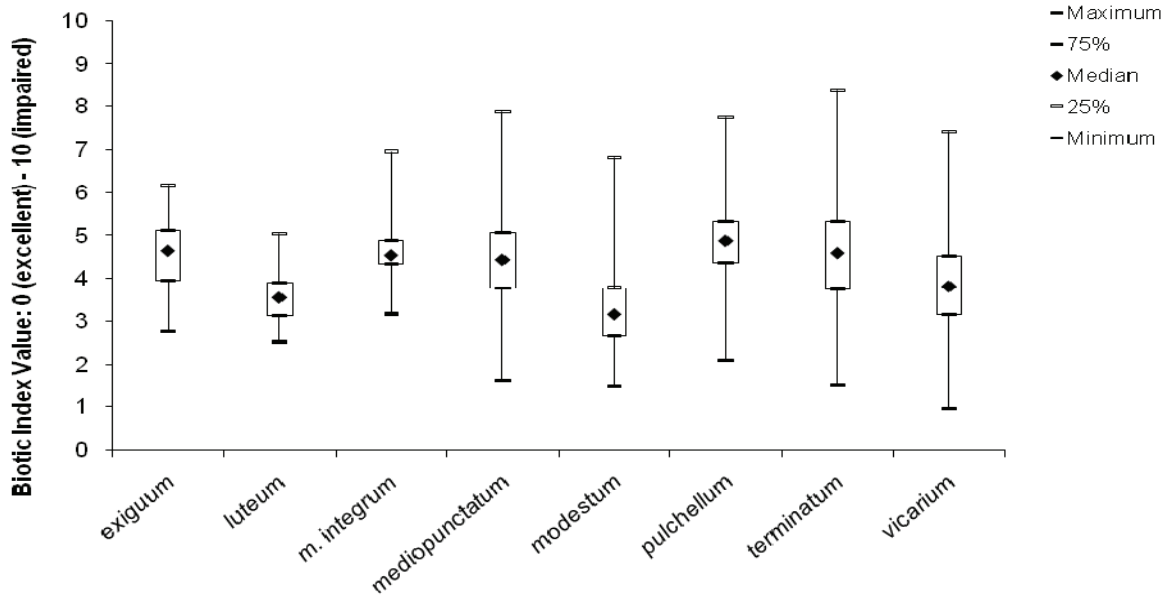
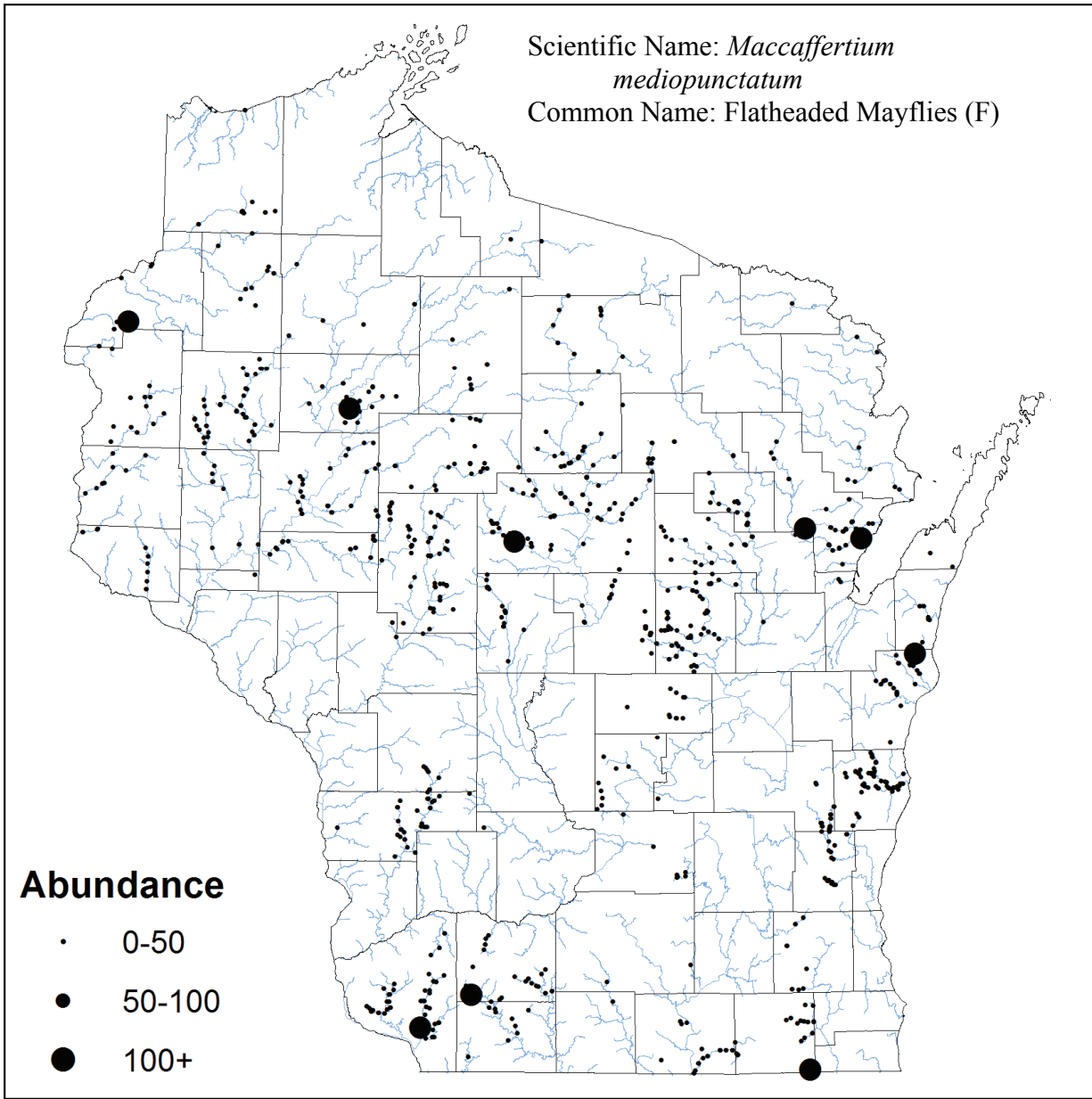


# Ephemeroptera Heptageniidae





# Ephemeroptera Heptageniidae

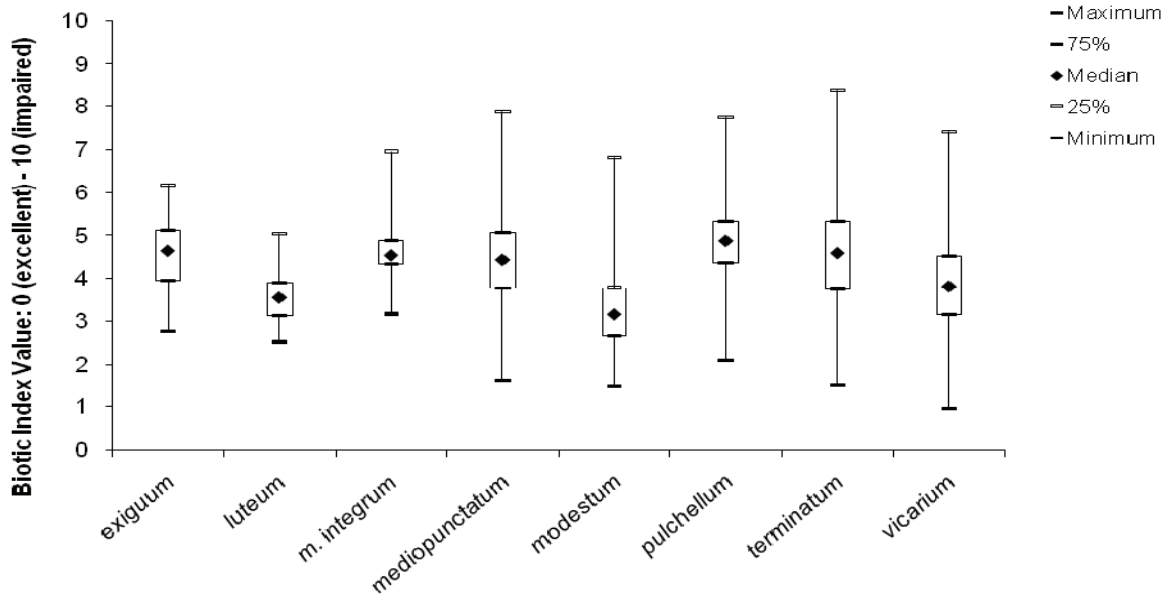
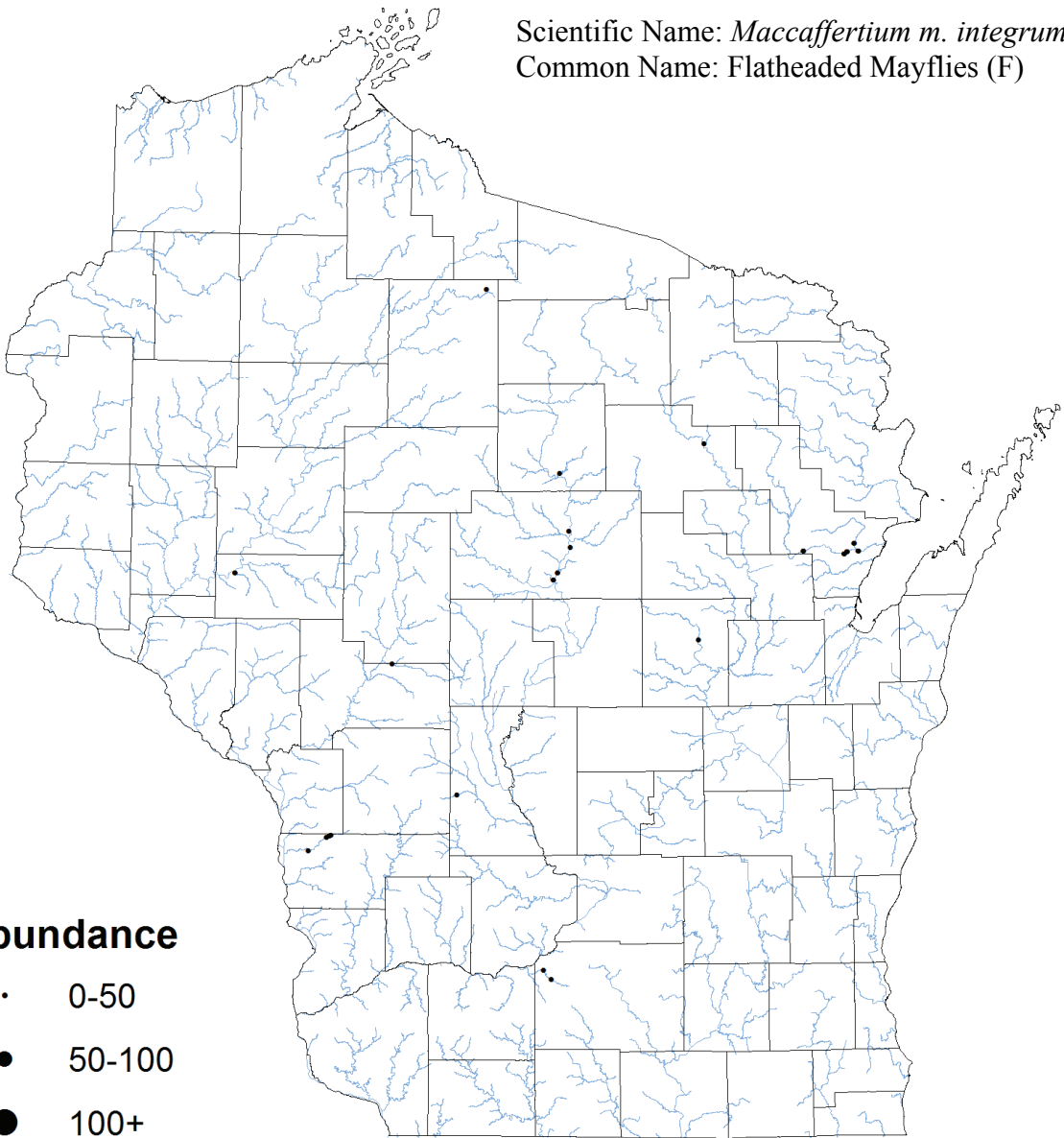


# Ephemeroptera Heptageniidae

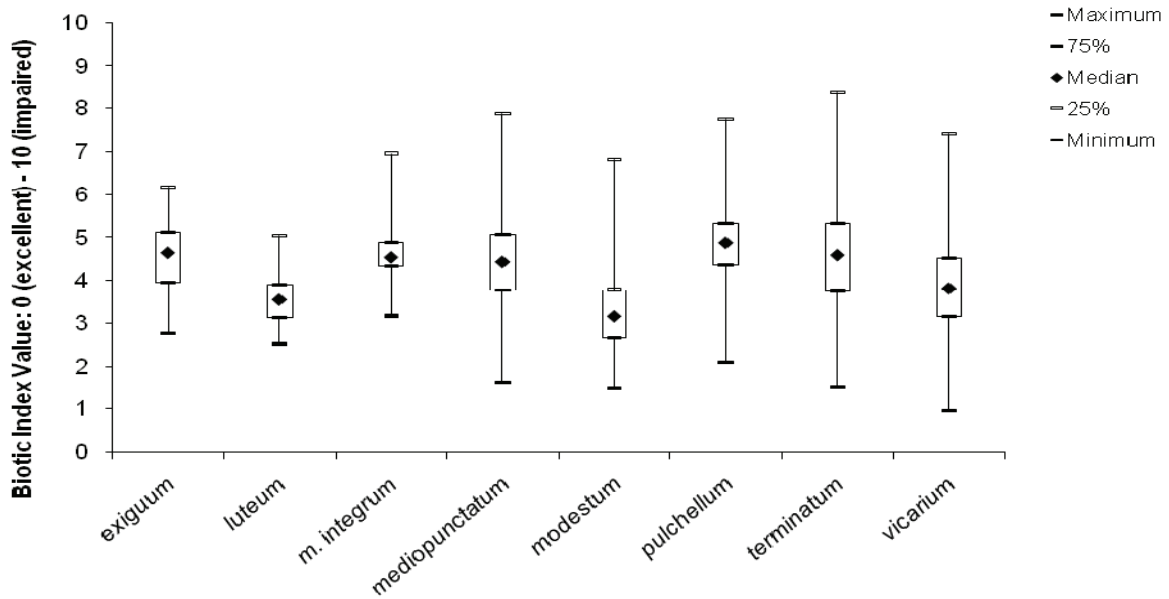
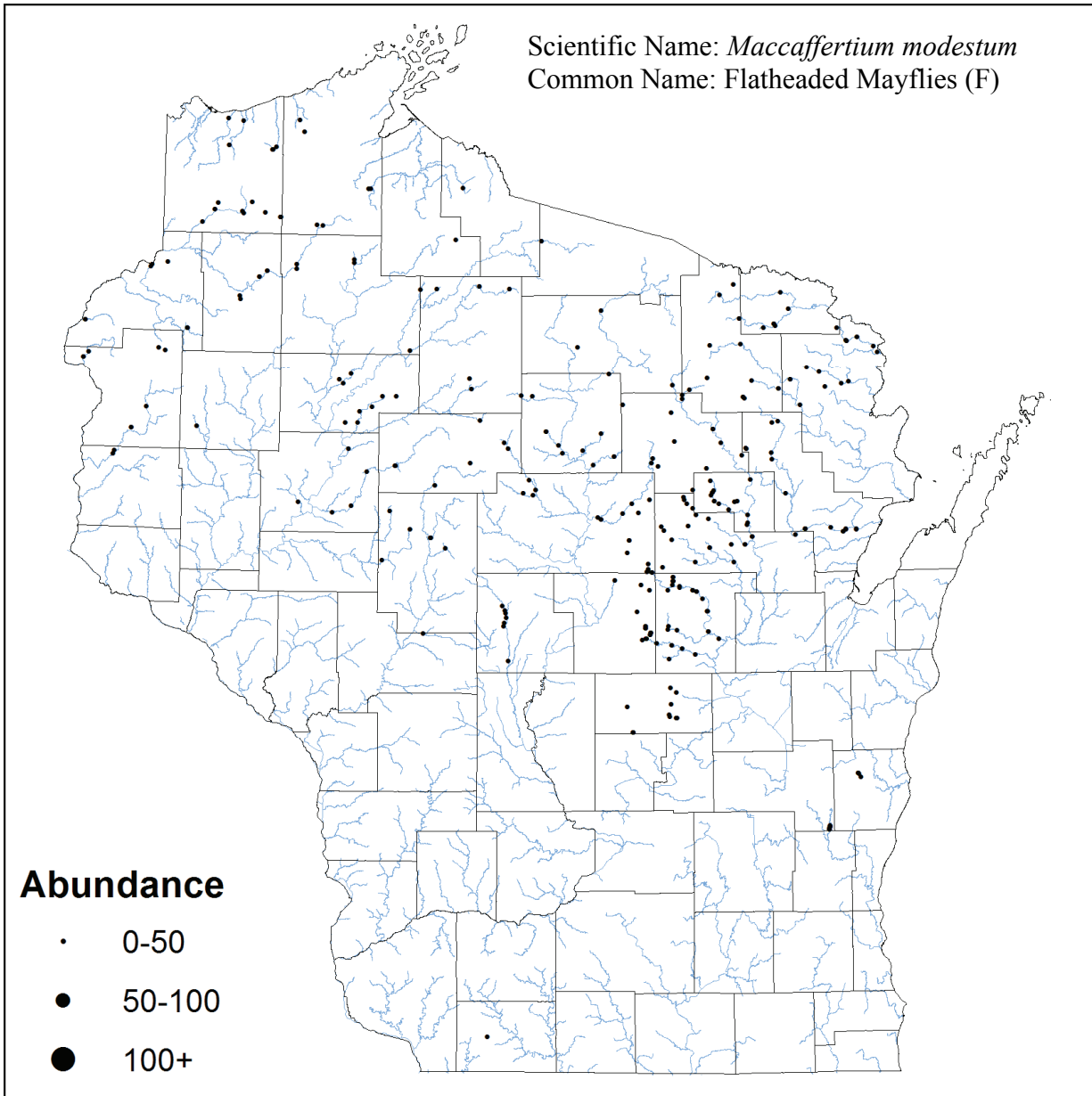
Scientific Name: *Maccaffertium m. integrum*  
 Common Name: Flatheaded Mayflies (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Heptageniidae

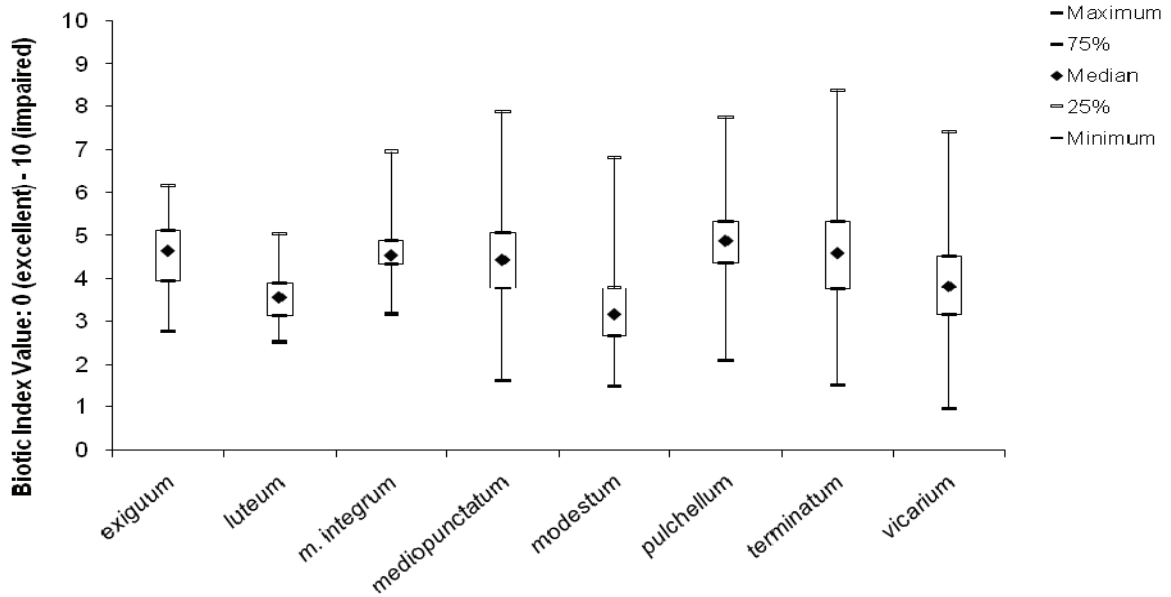
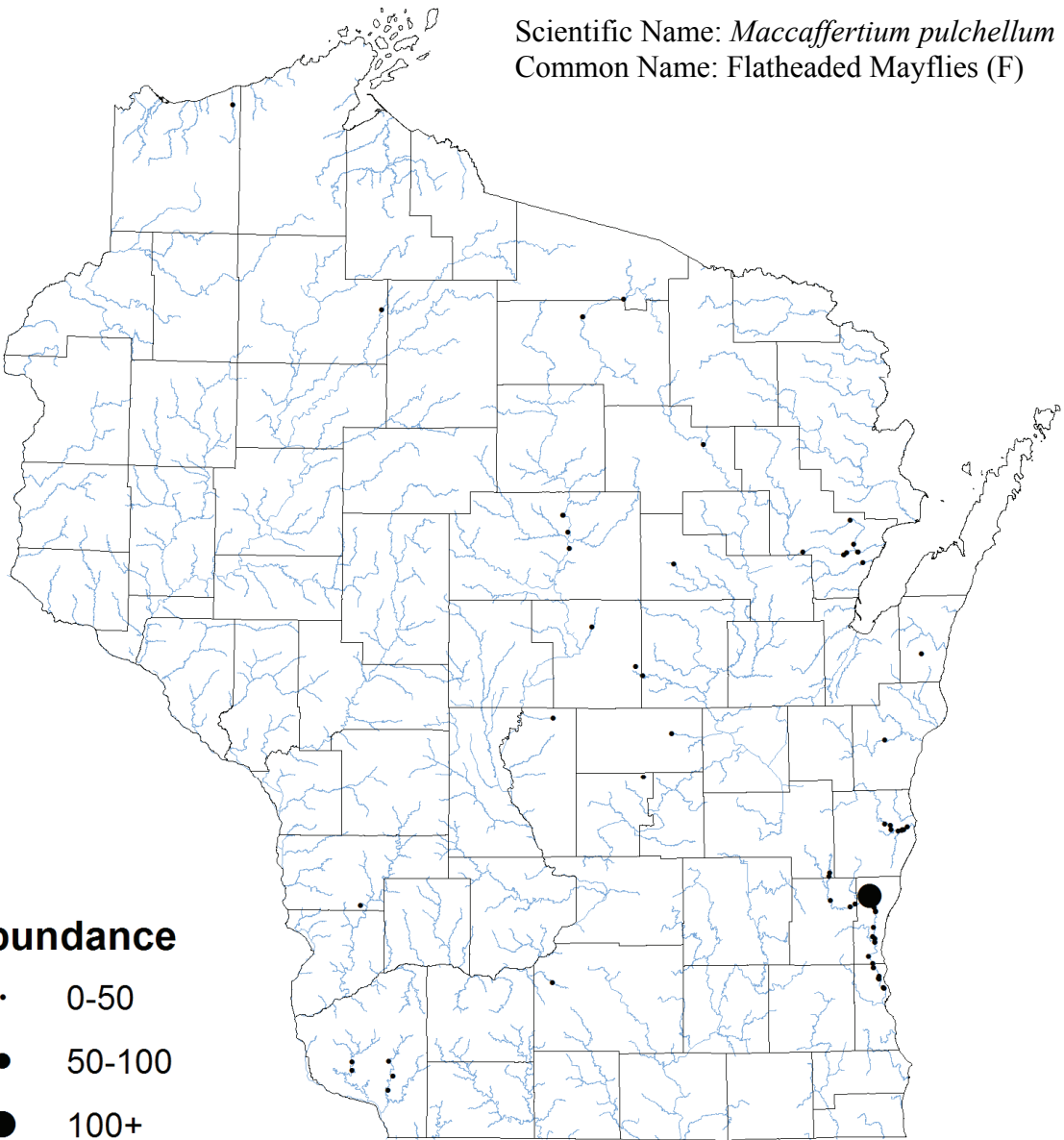


# Ephemeroptera Heptageniidae

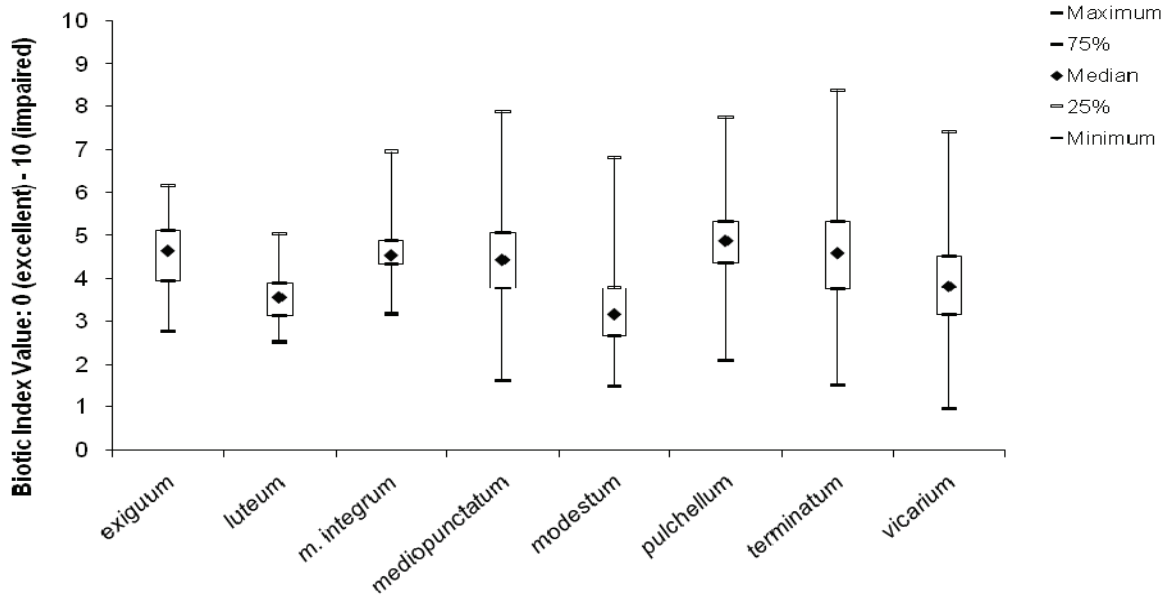
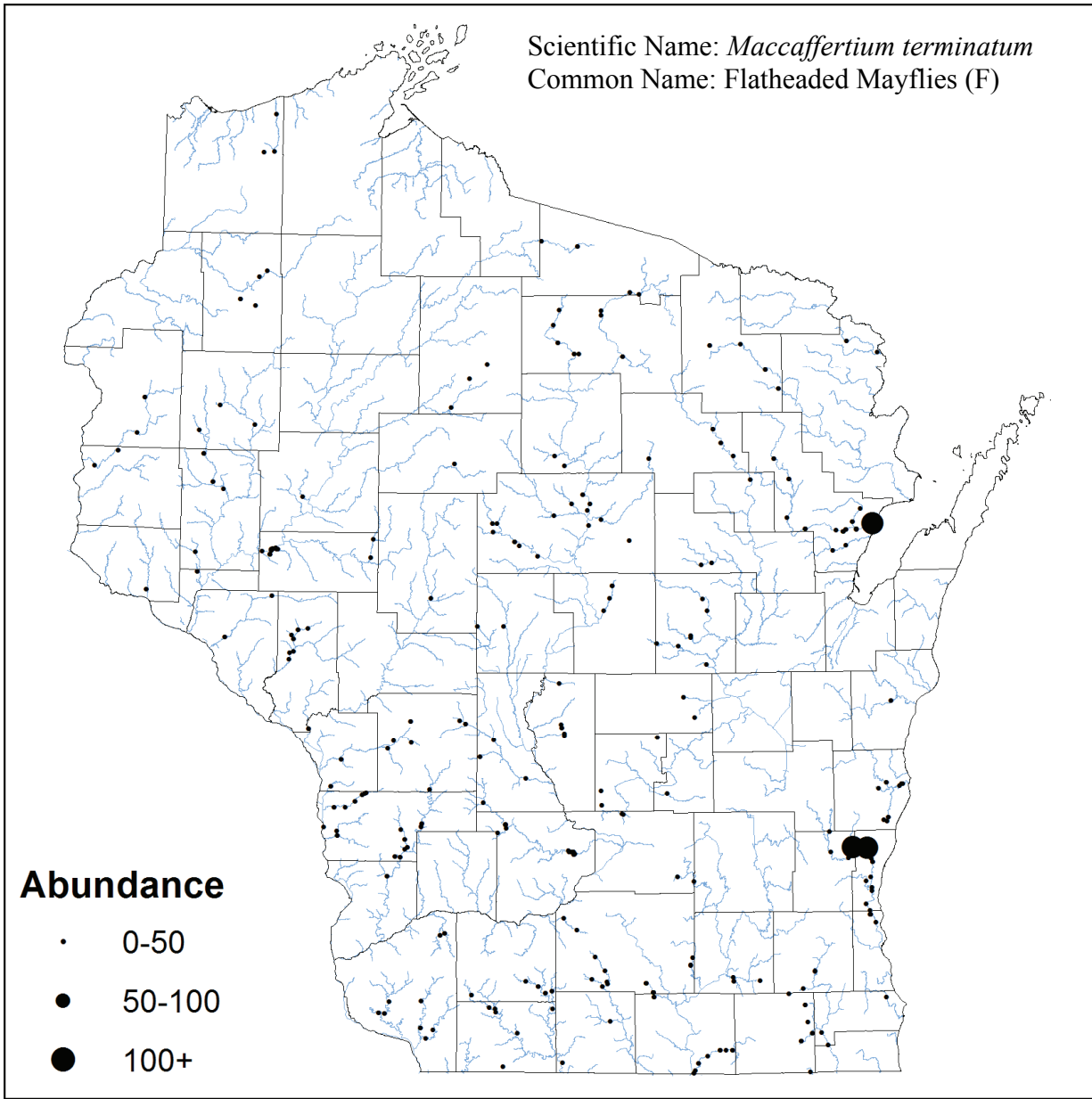
Scientific Name: *Maccaffertium pulchellum*  
 Common Name: Flatheaded Mayflies (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Heptageniidae

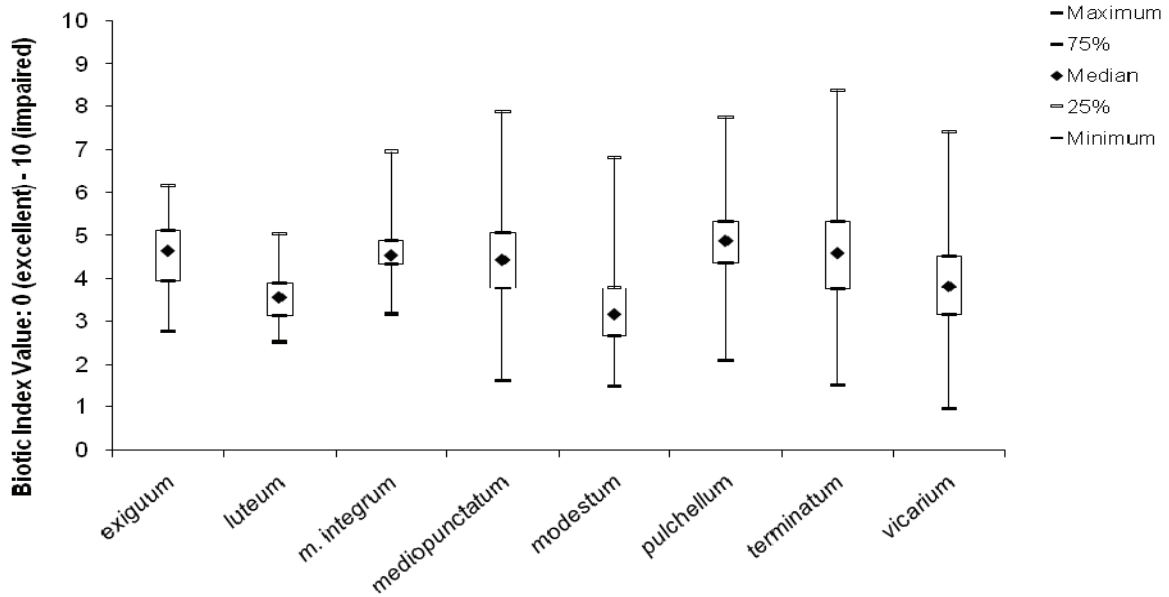
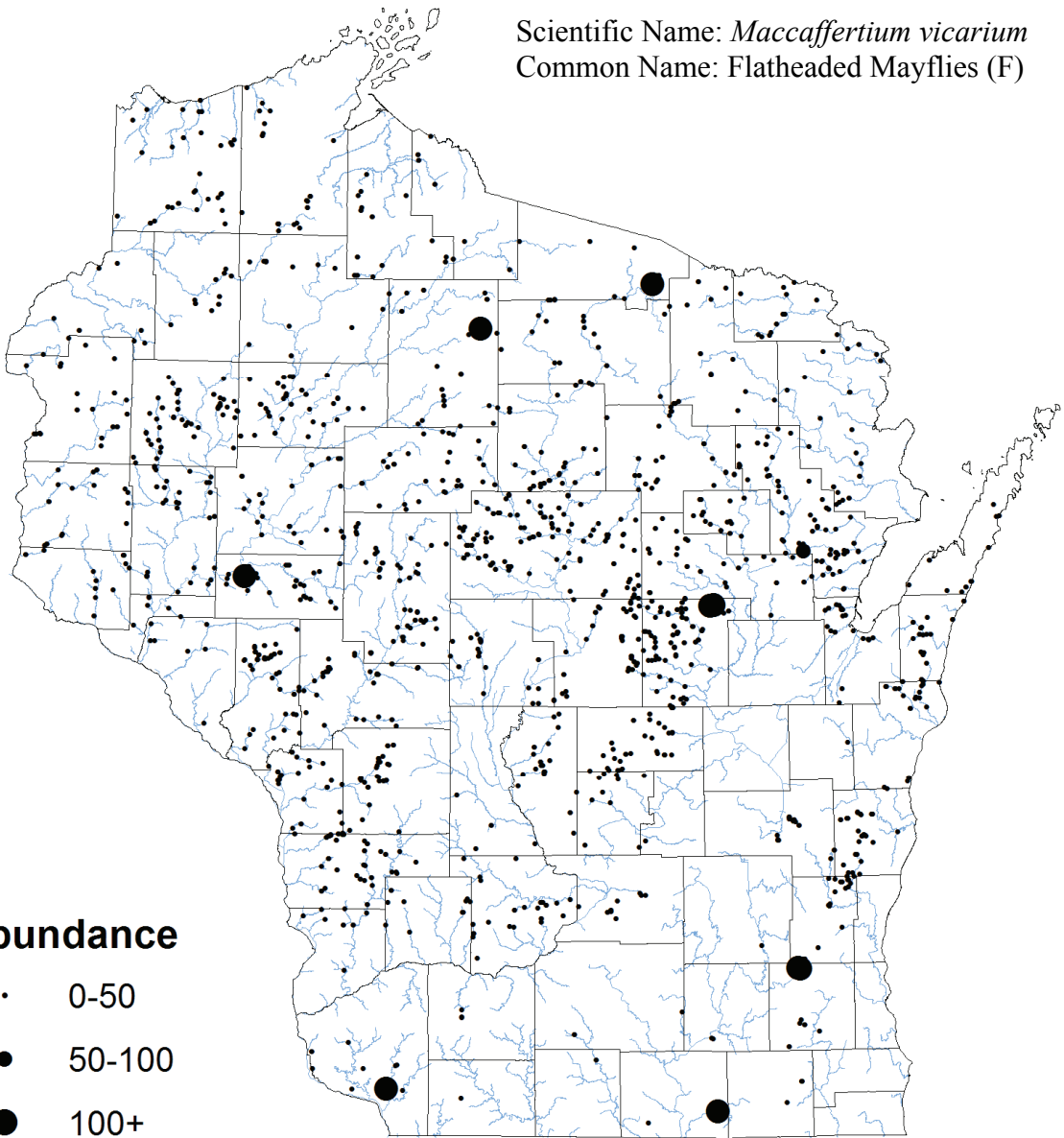


# Ephemeroptera Heptageniidae

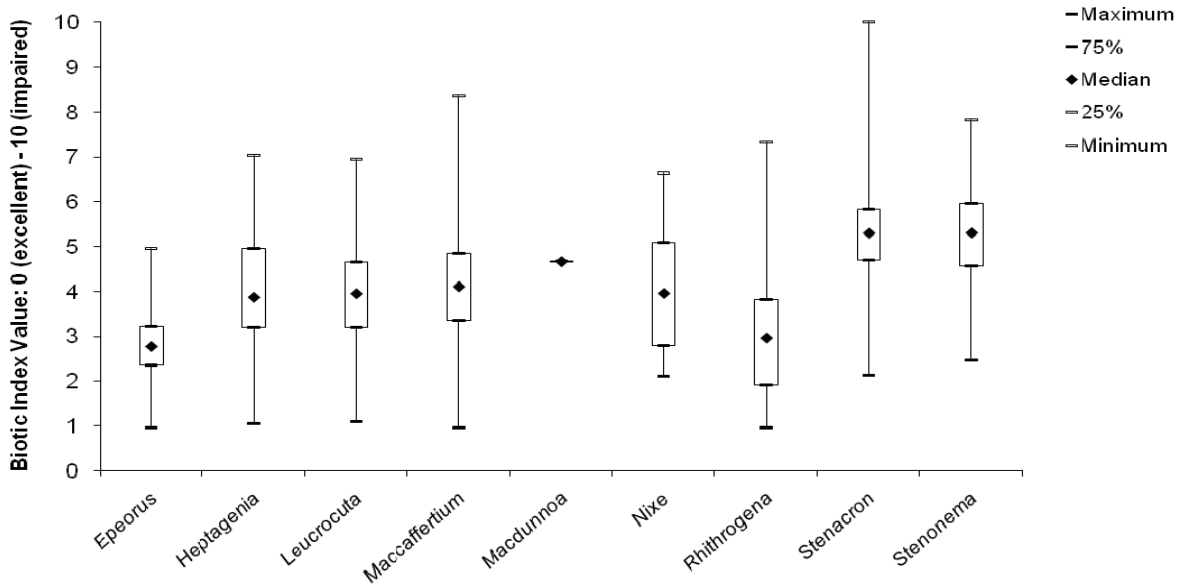
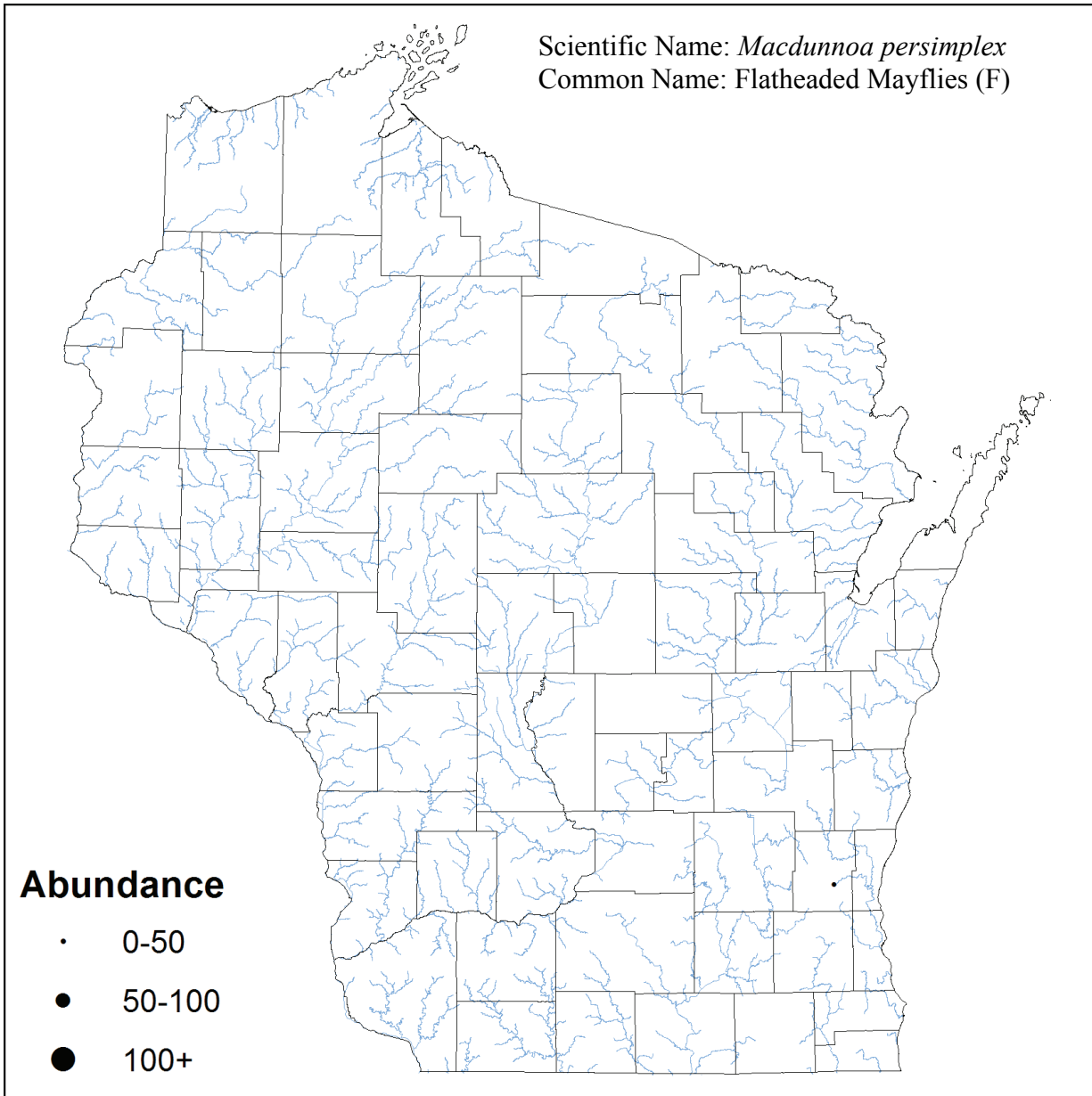
Scientific Name: *Maccaffertium vicarium*  
 Common Name: Flatheaded Mayflies (F)

## Abundance

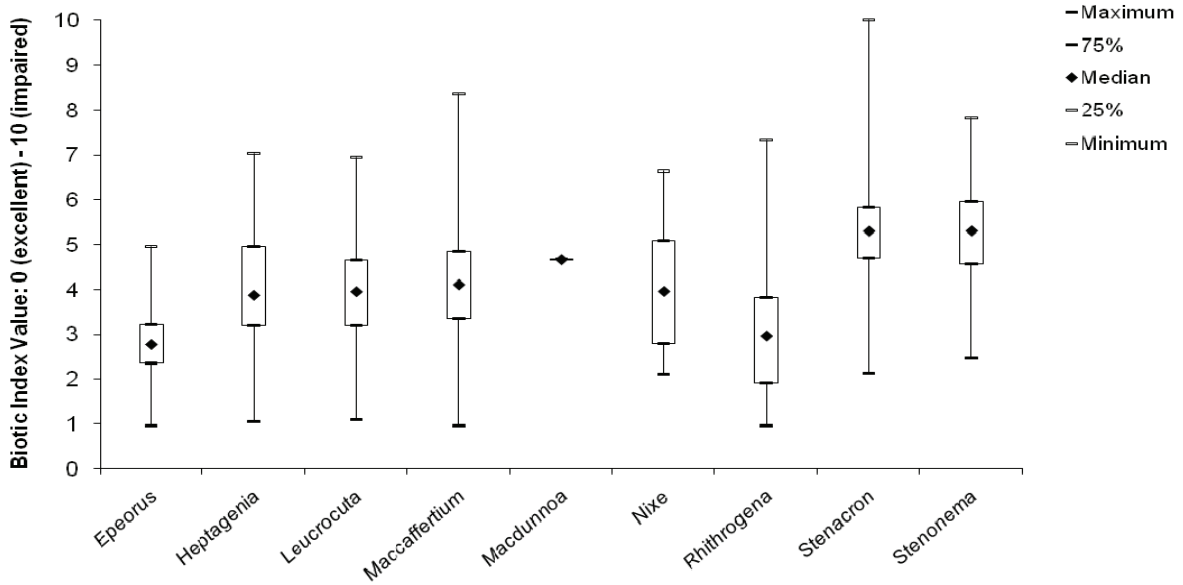
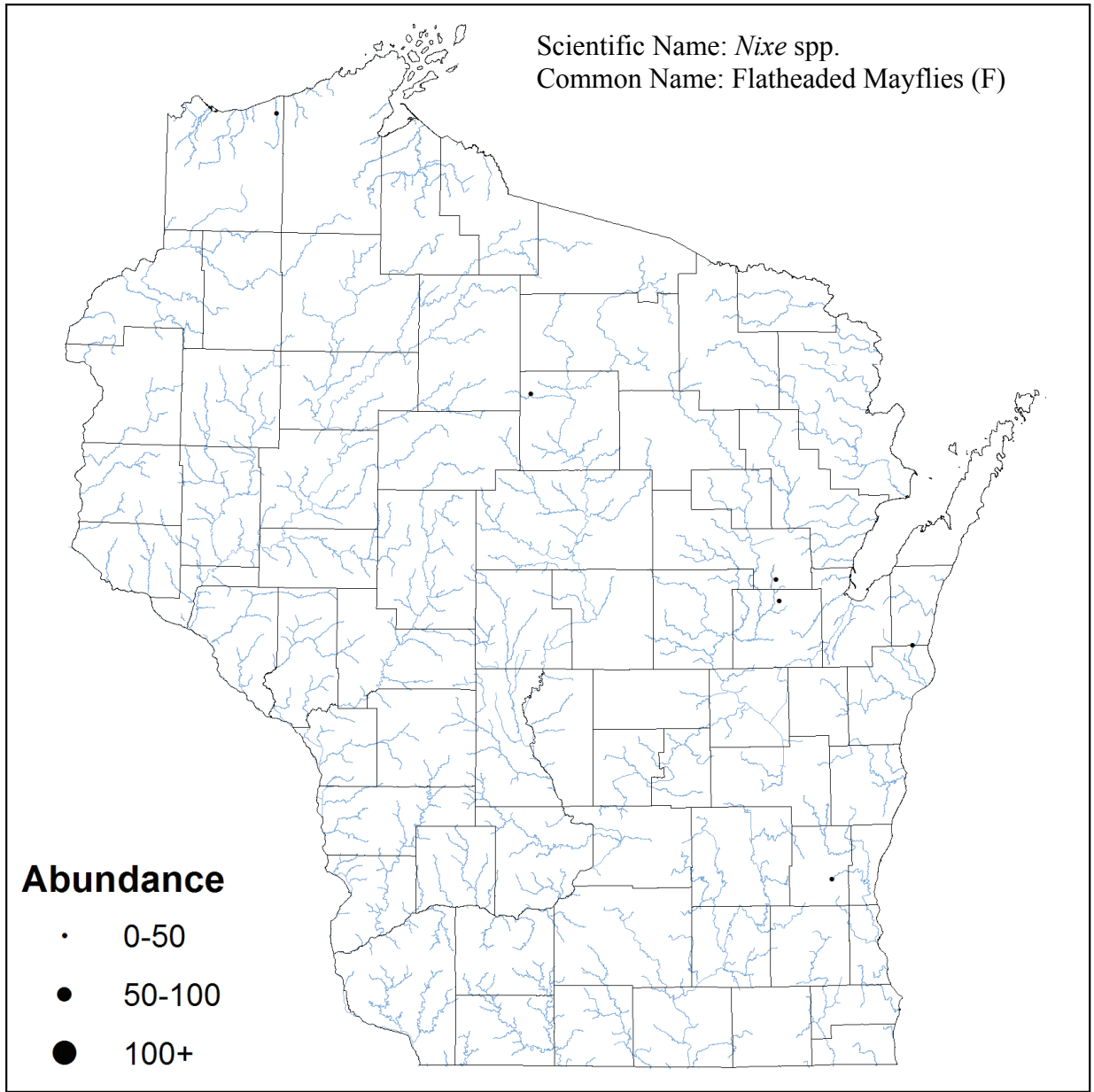
- 0-50
- 50-100
- 100+



# Ephemeroptera Heptageniidae

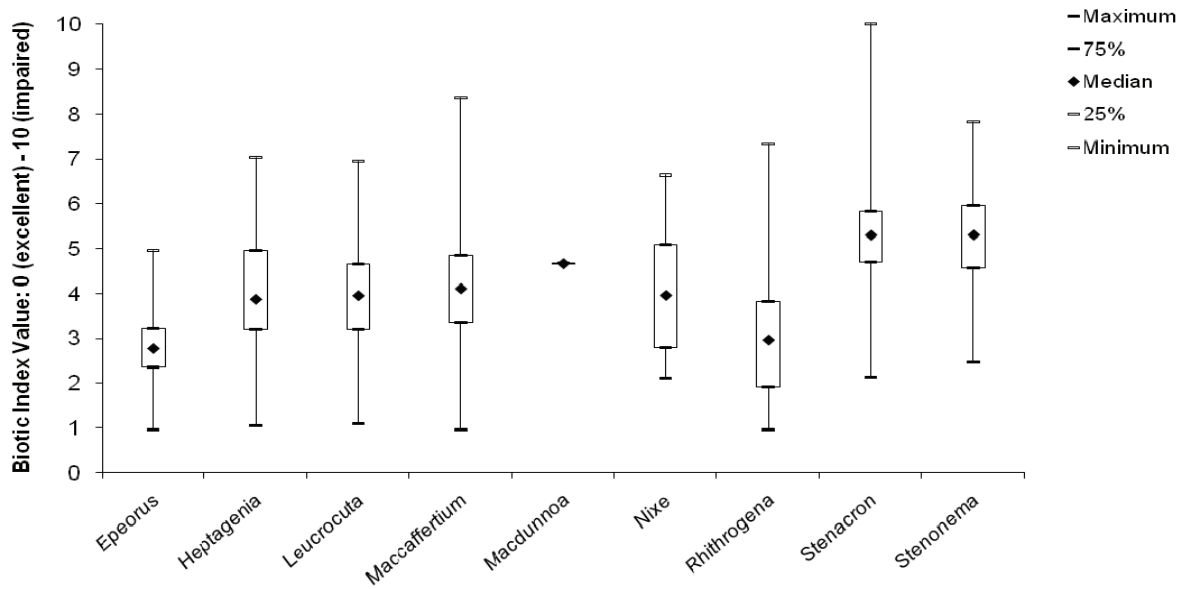
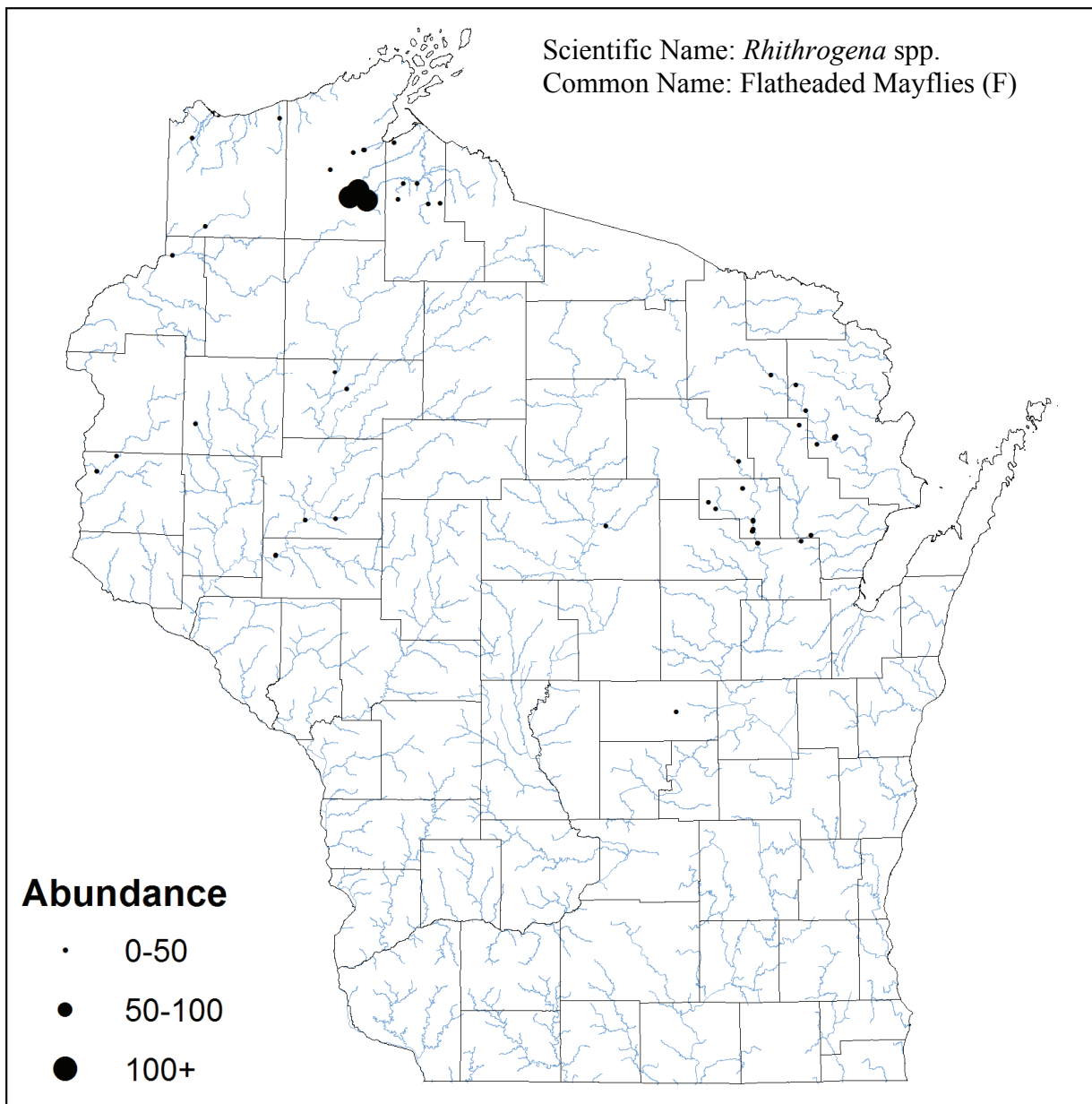


# Ephemeroptera Heptageniidae





# Ephemeroptera Heptageniidae

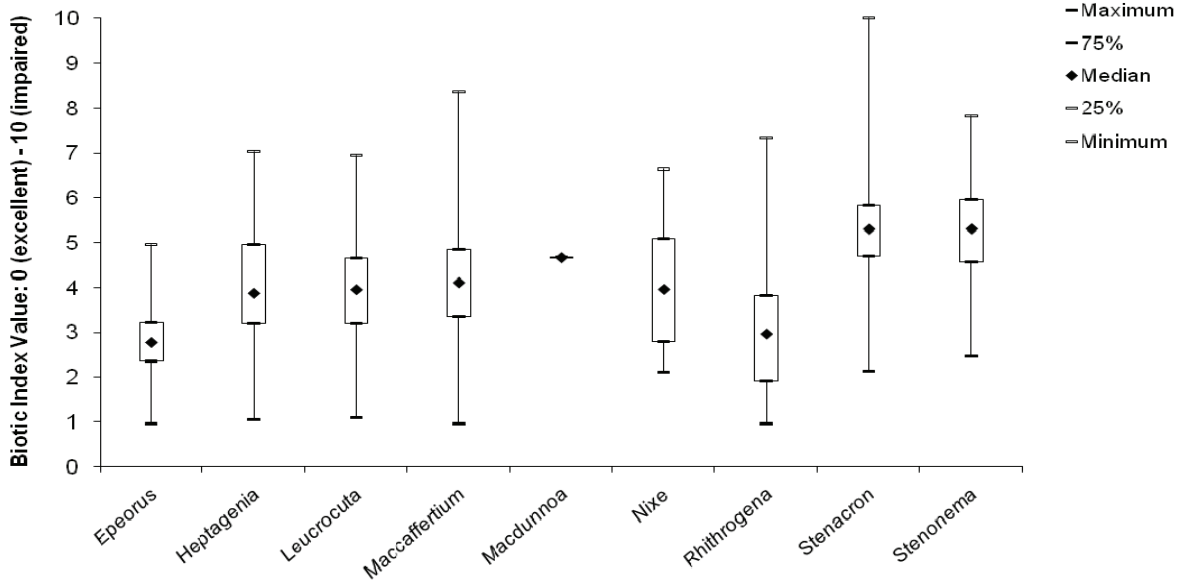
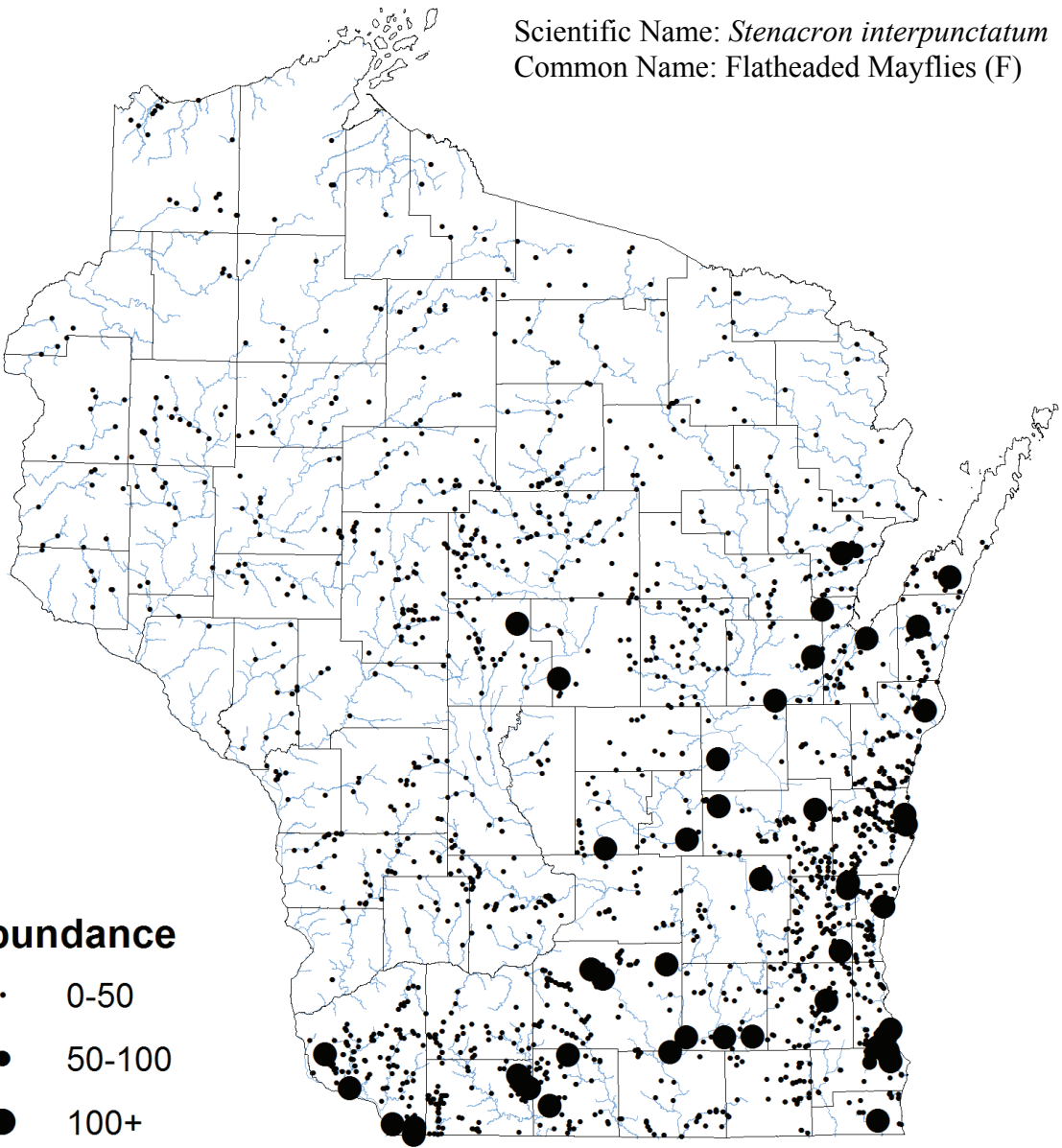


# Ephemeroptera Heptageniidae

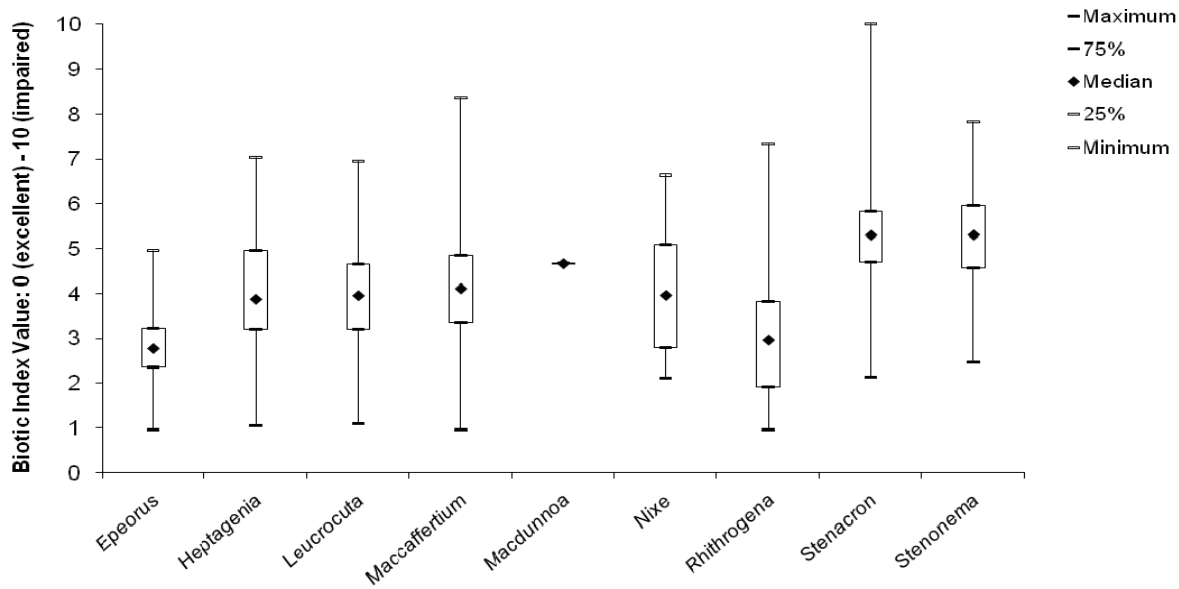
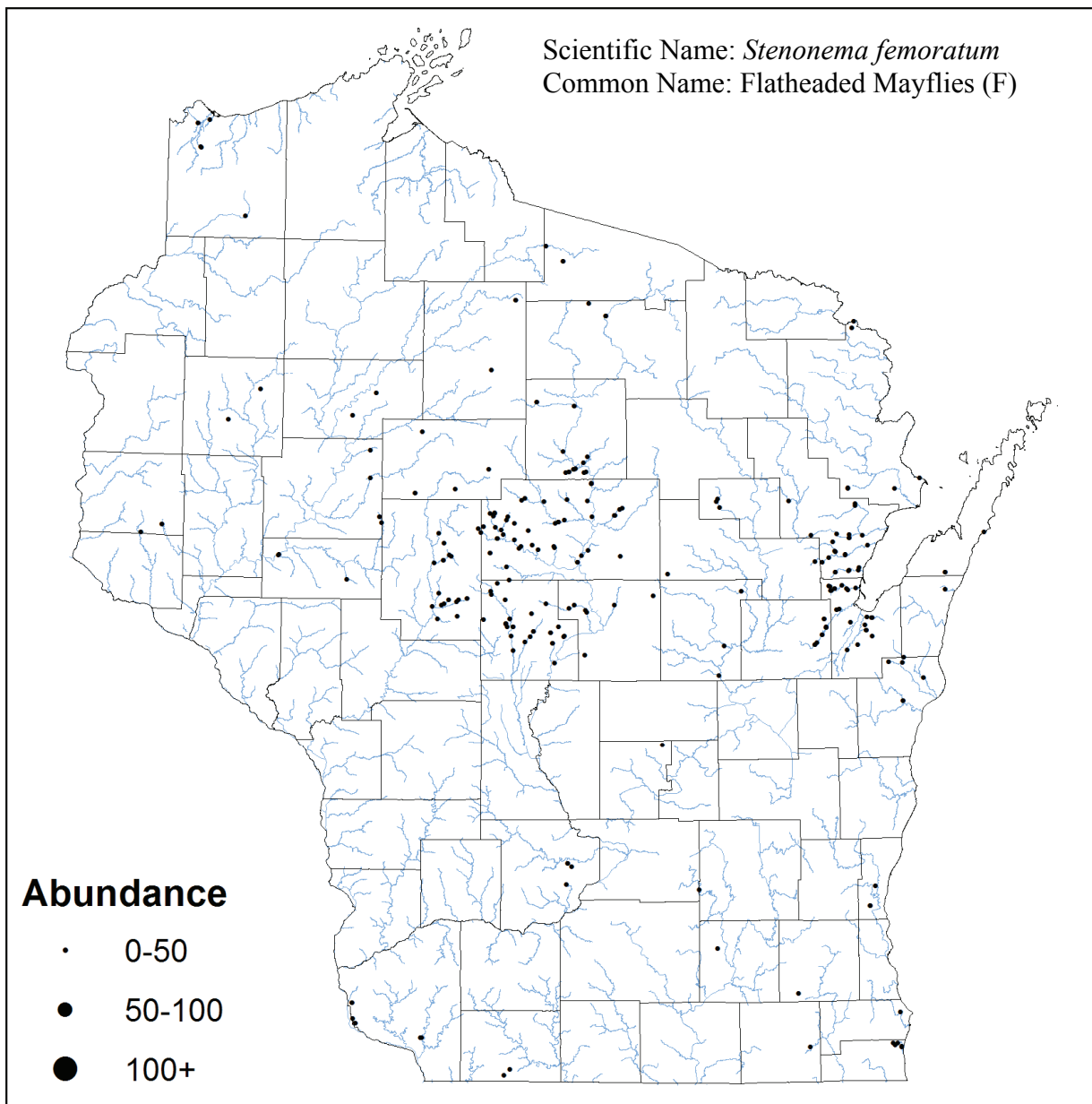
Scientific Name: *Stenacron interpunctatum*  
 Common Name: Flatheaded Mayflies (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Heptageniidae

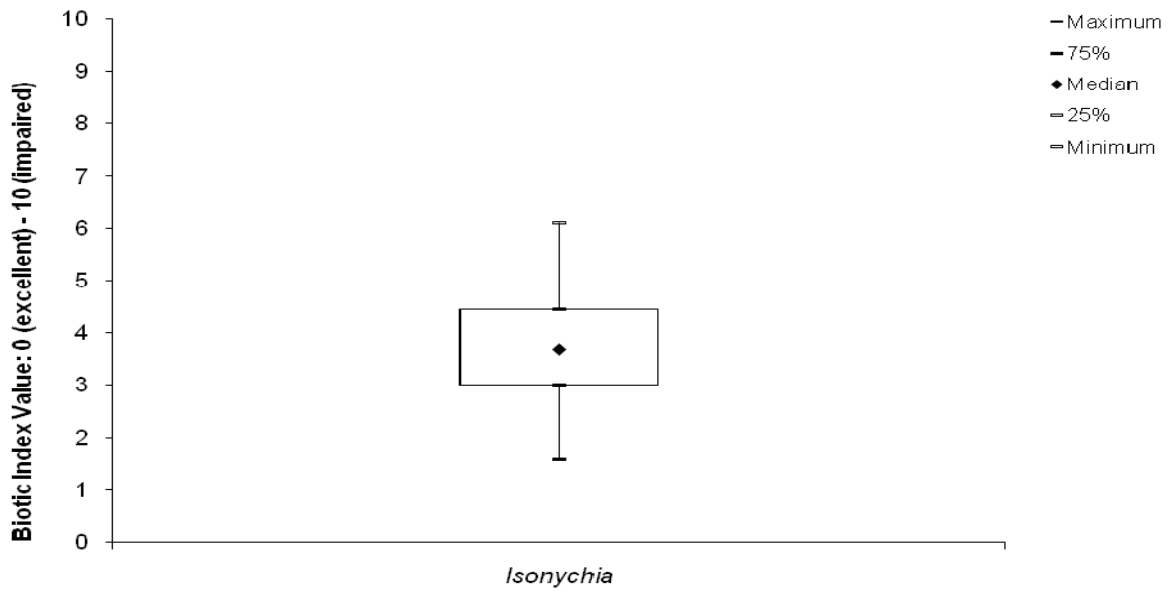
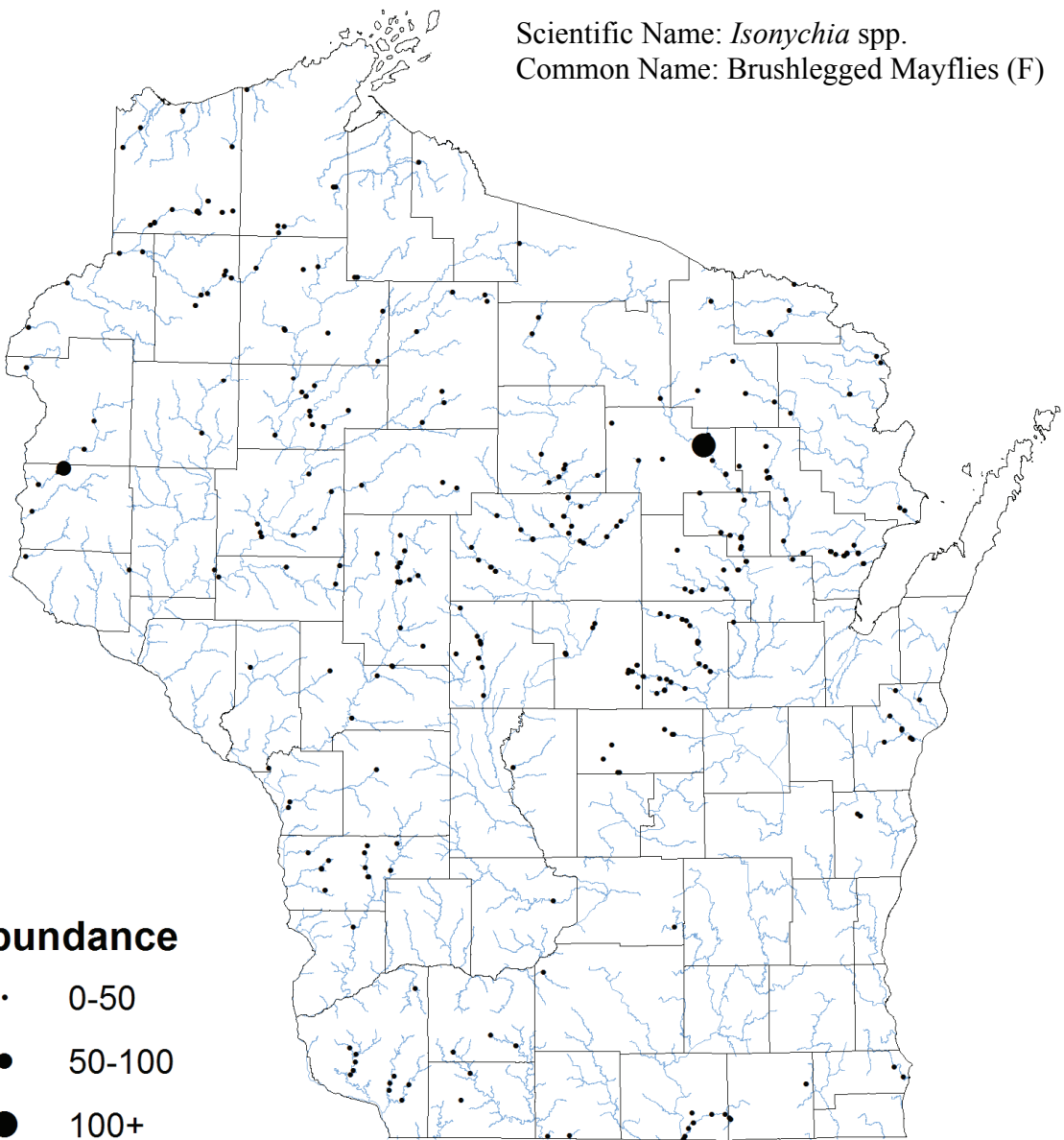


# Ephemeroptera Isonychiidae

Scientific Name: *Isonychia* spp.  
Common Name: Brushlegged Mayflies (F)

## Abundance

- 0-50
- 50-100
- 100+

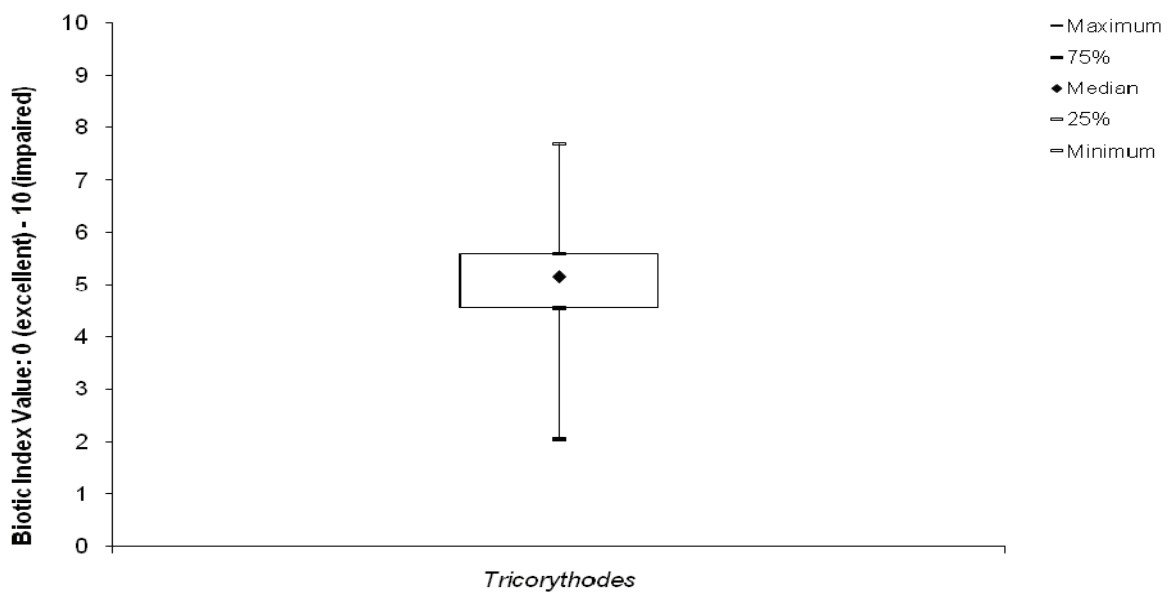
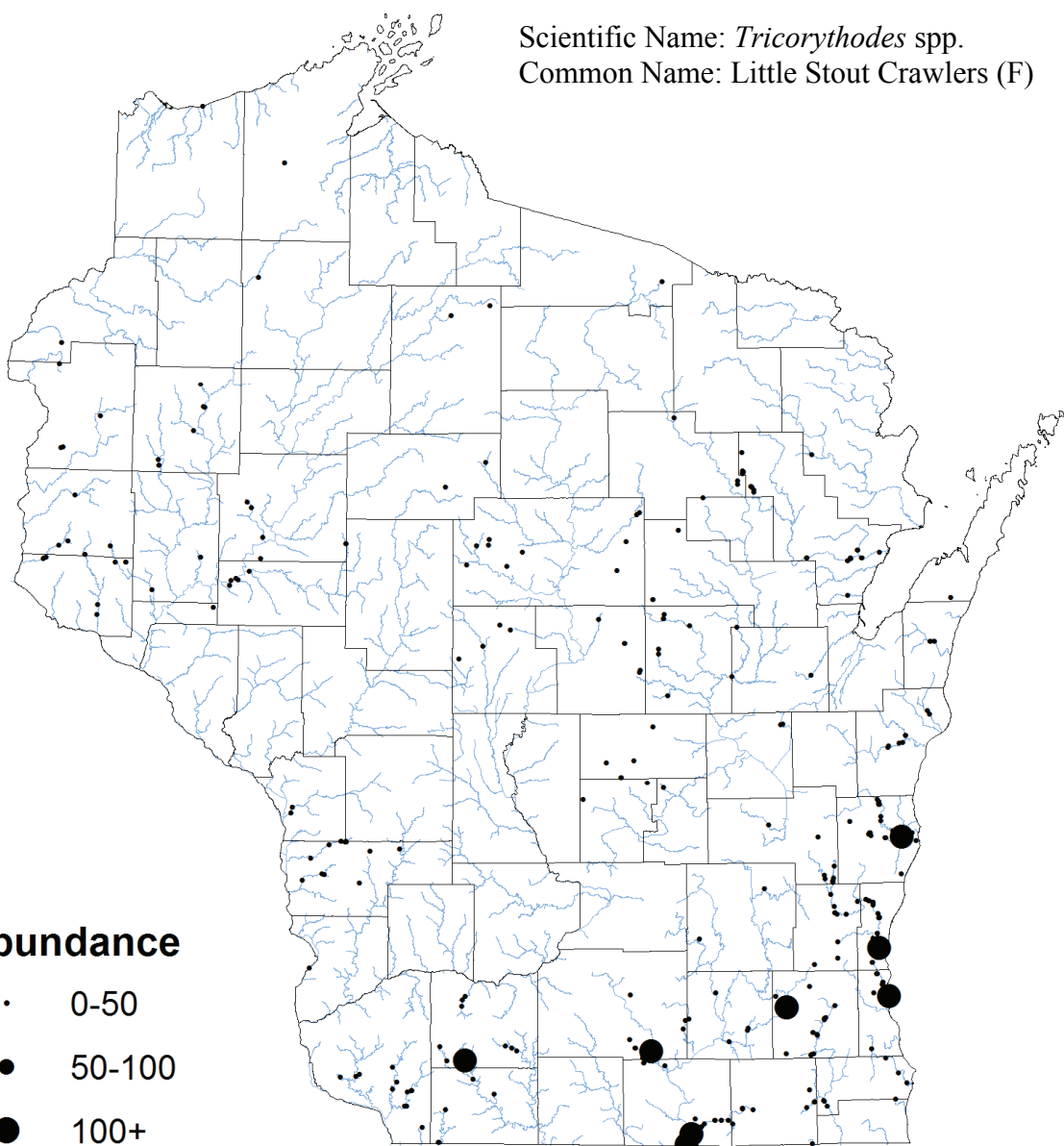


# Ephemeroptera Leptohyphidae

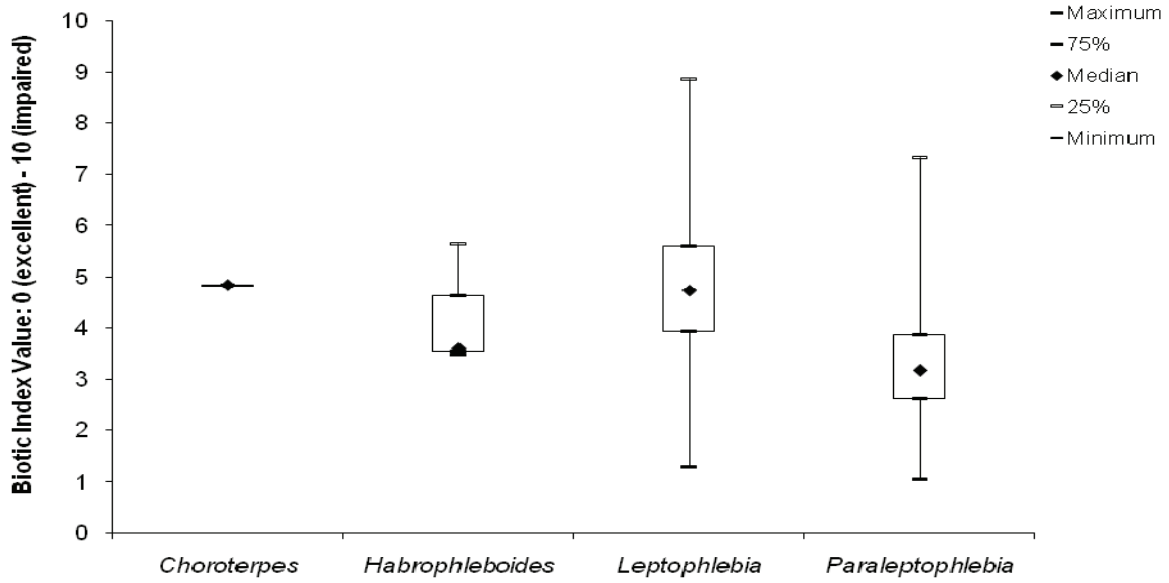
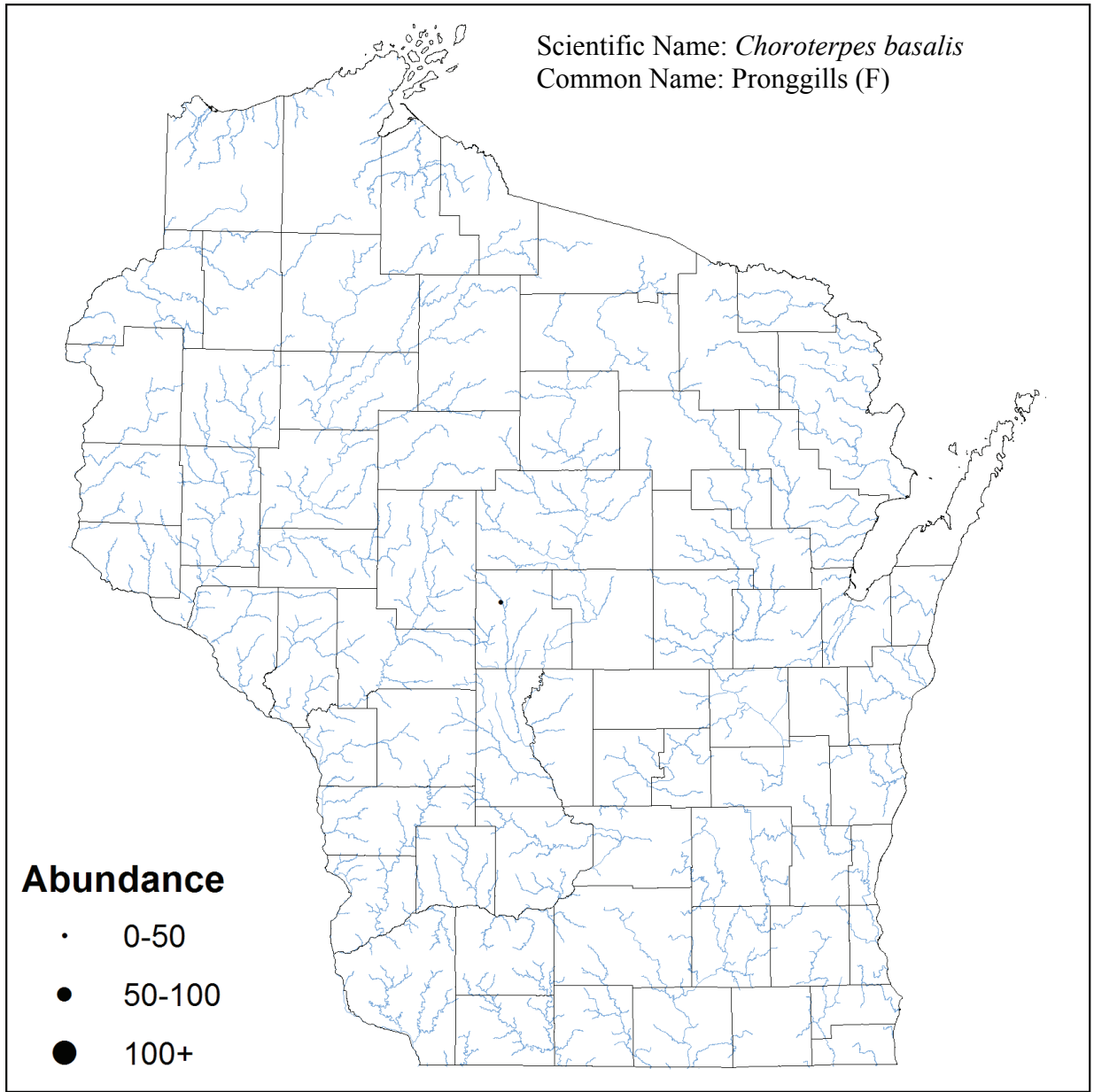
Scientific Name: *Tricorythodes* spp.  
Common Name: Little Stout Crawlers (F)

## Abundance

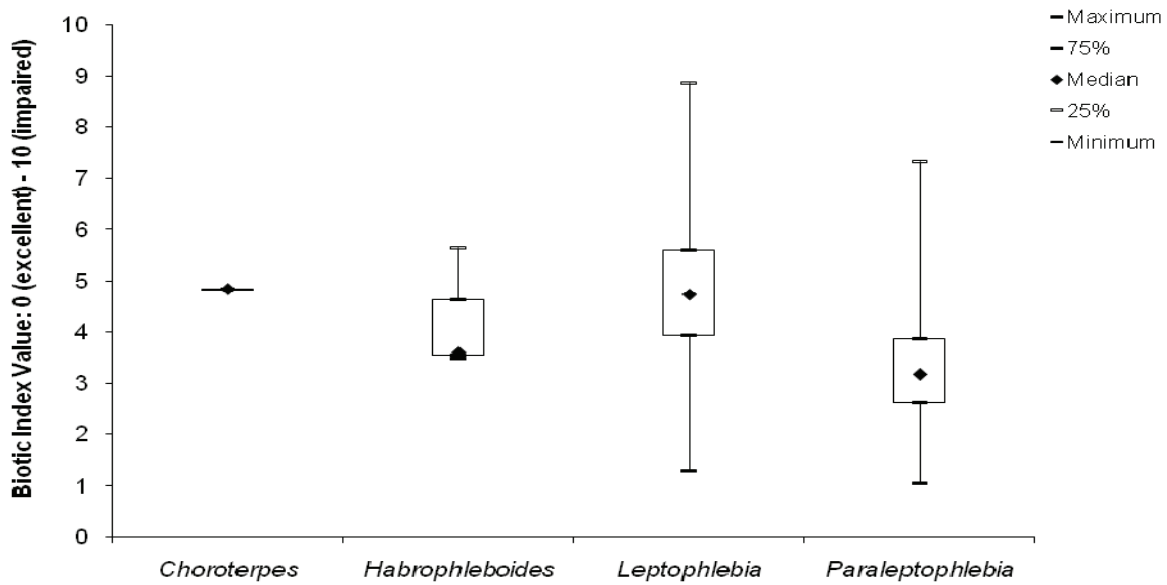
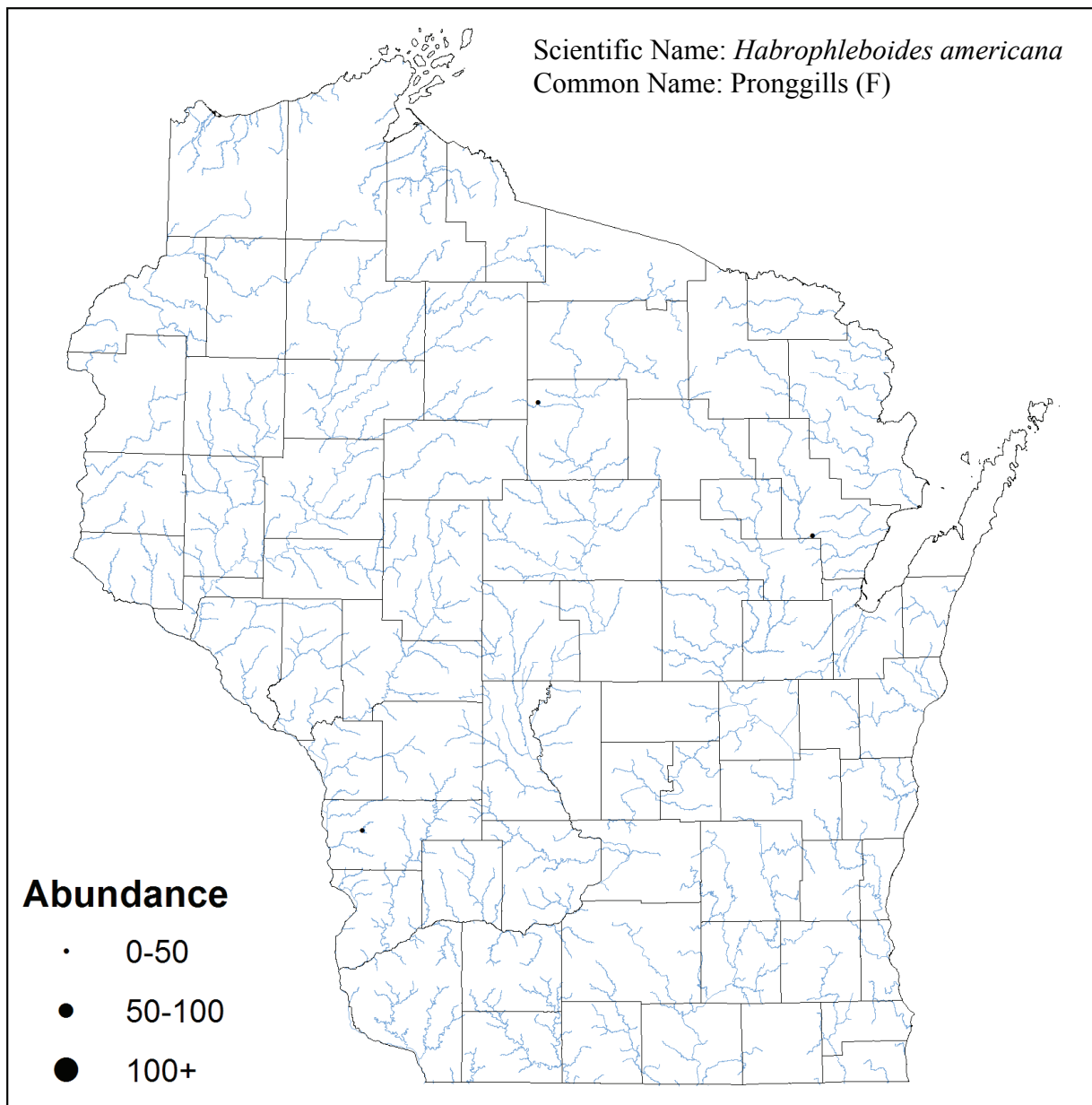
- 0-50
- 50-100
- 100+



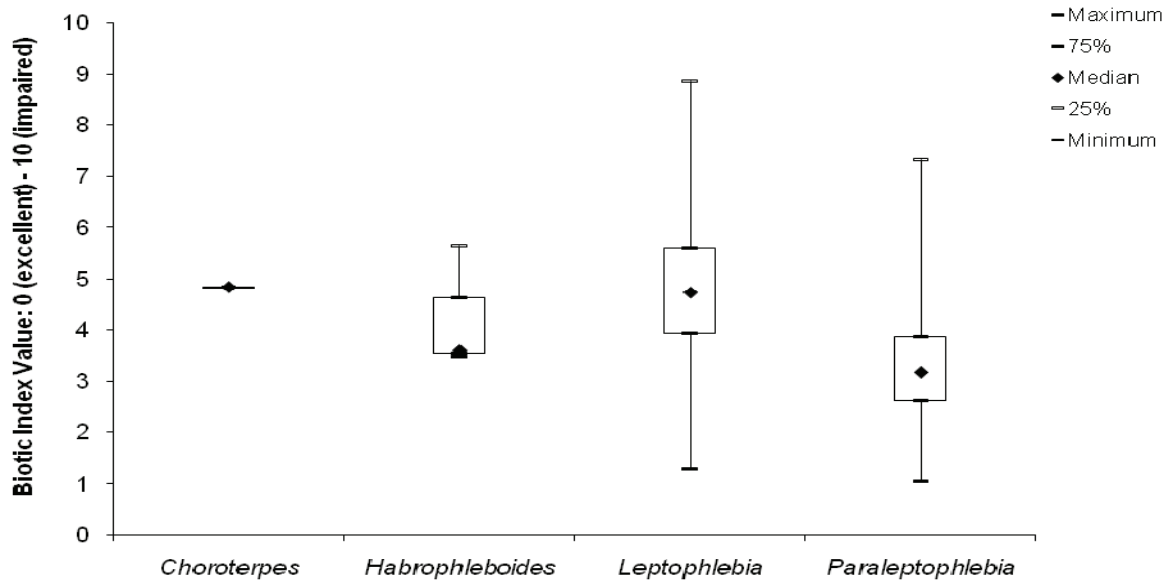
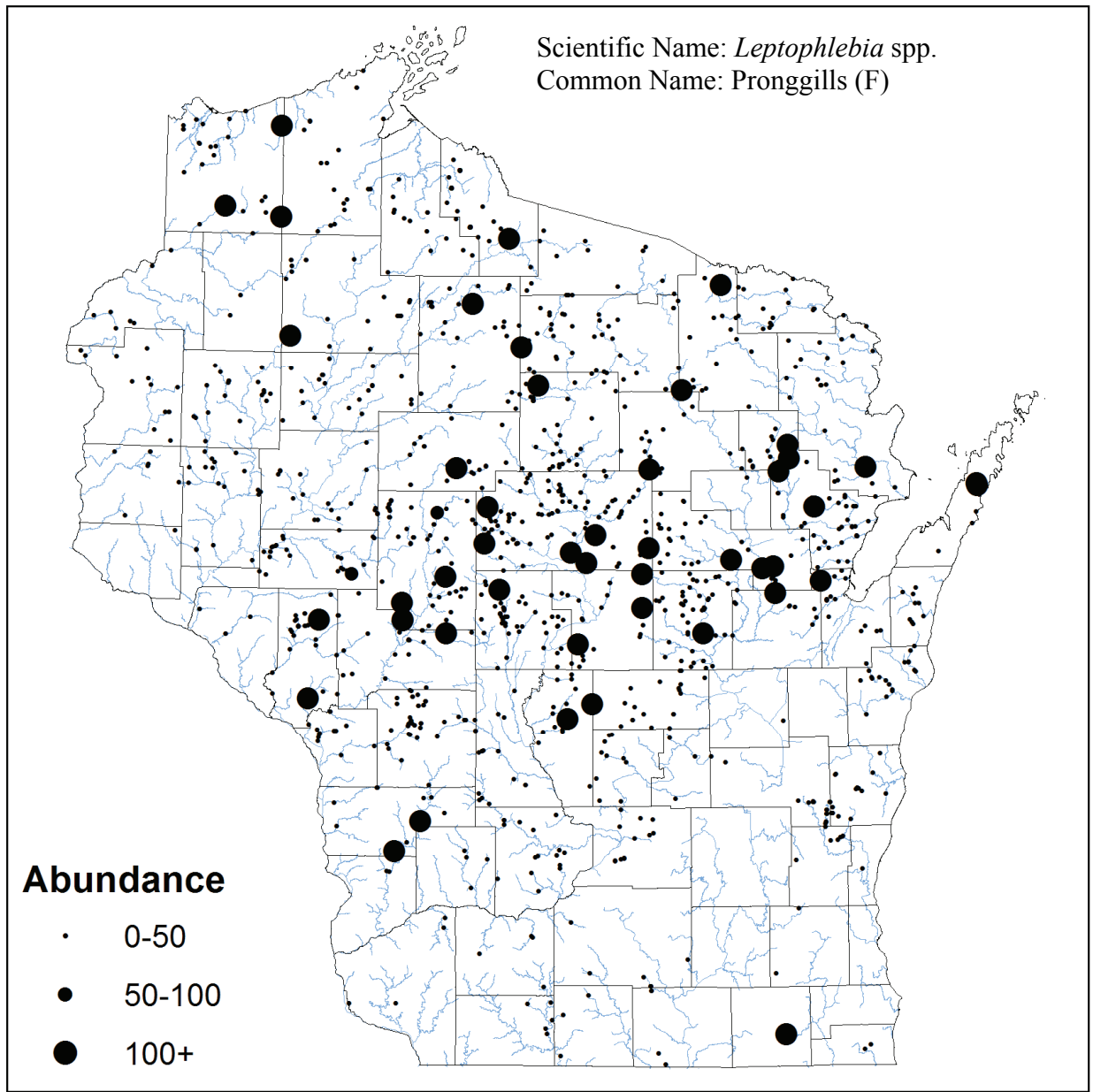
# Ephemeroptera Leptophlebiidae



# Ephemeroptera Leptophlebiidae

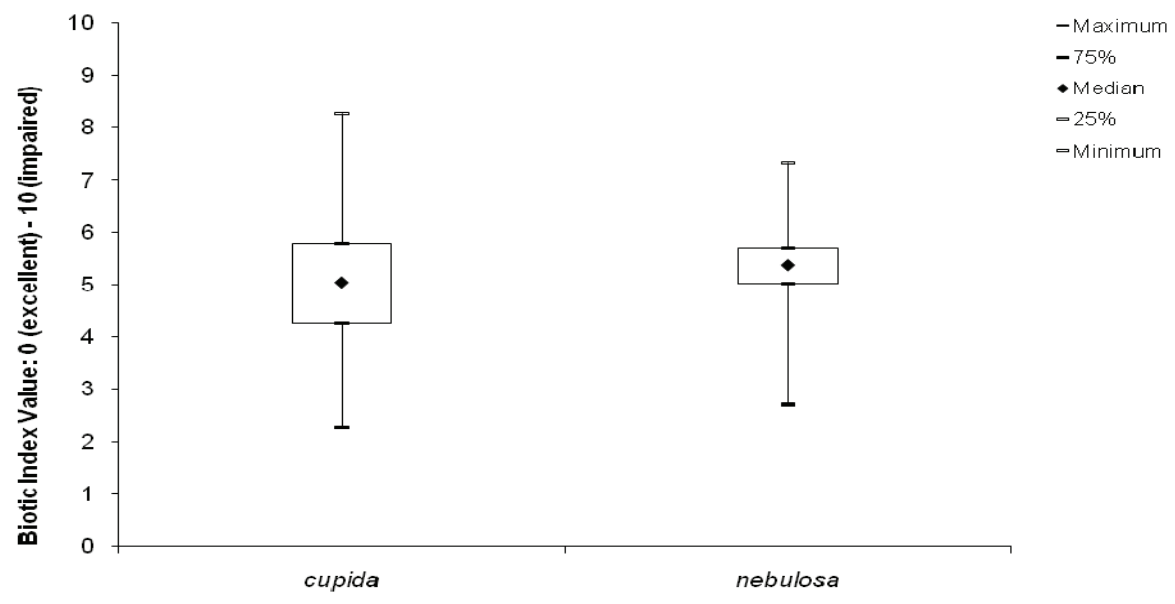
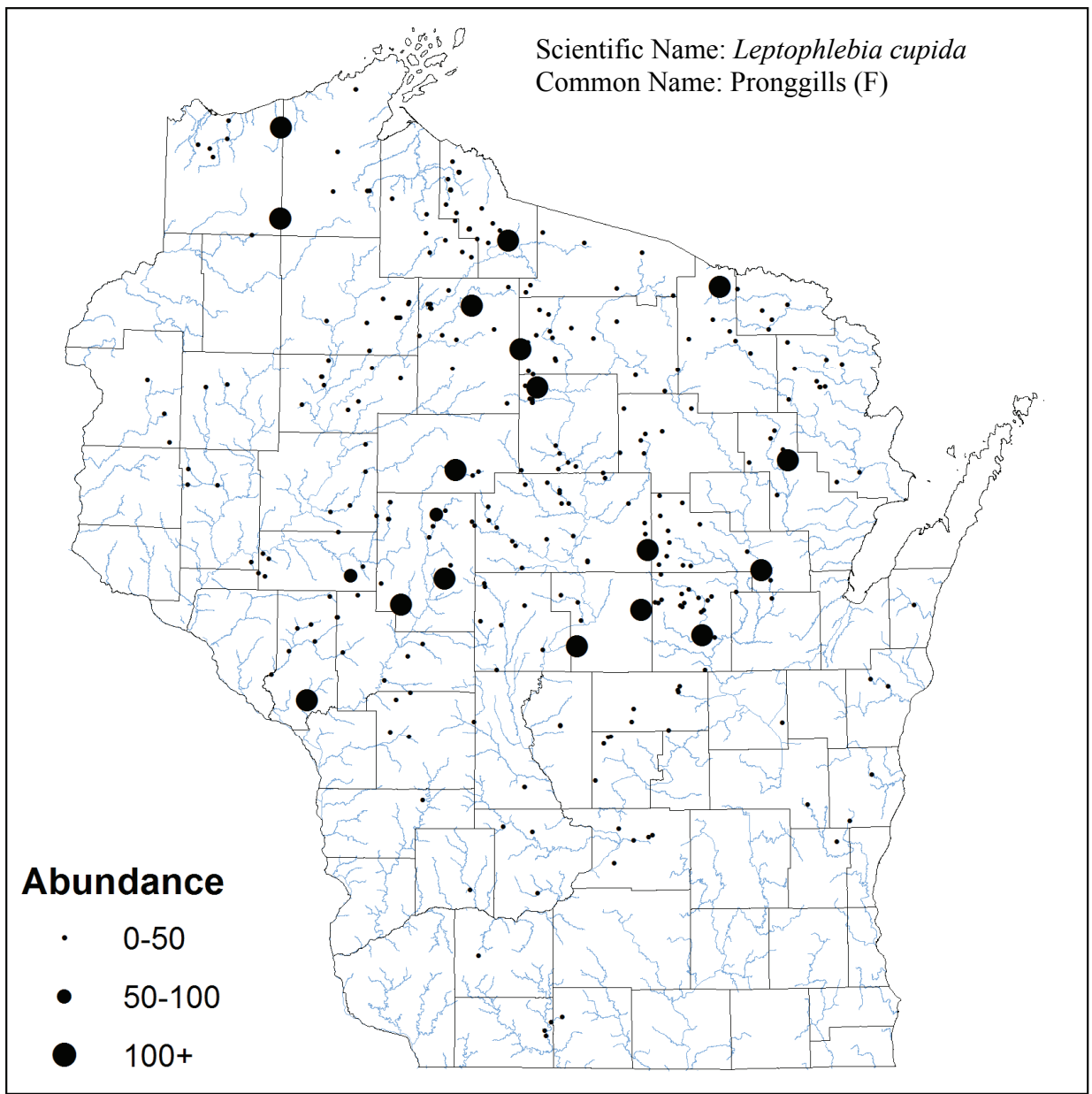


# Ephemeroptera Leptophlebiidae





# Ephemeroptera Leptophlebiidae

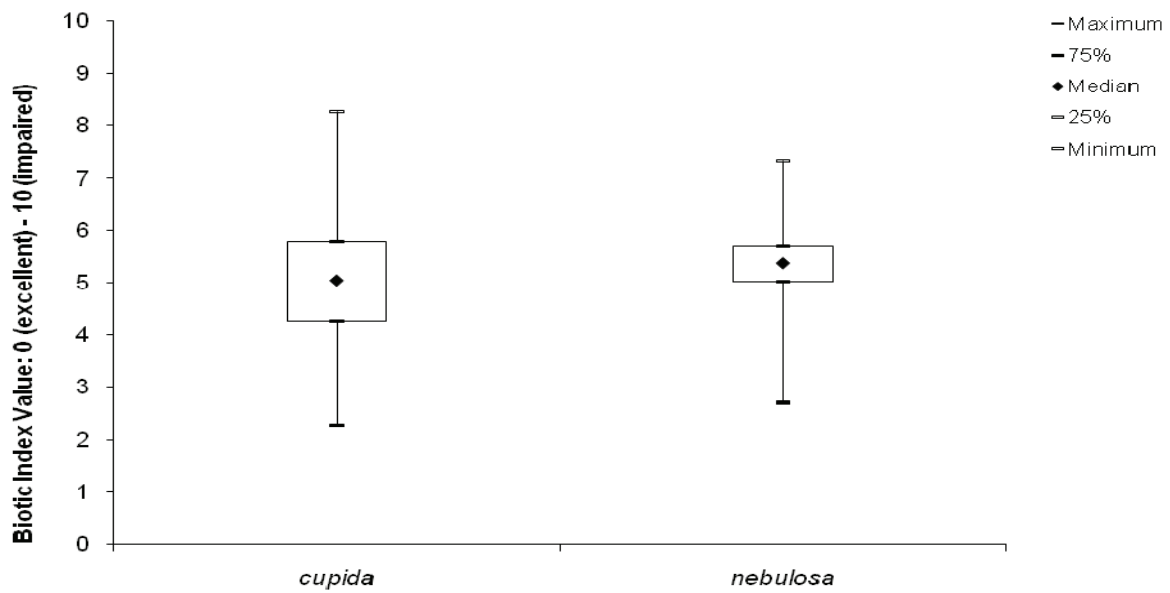
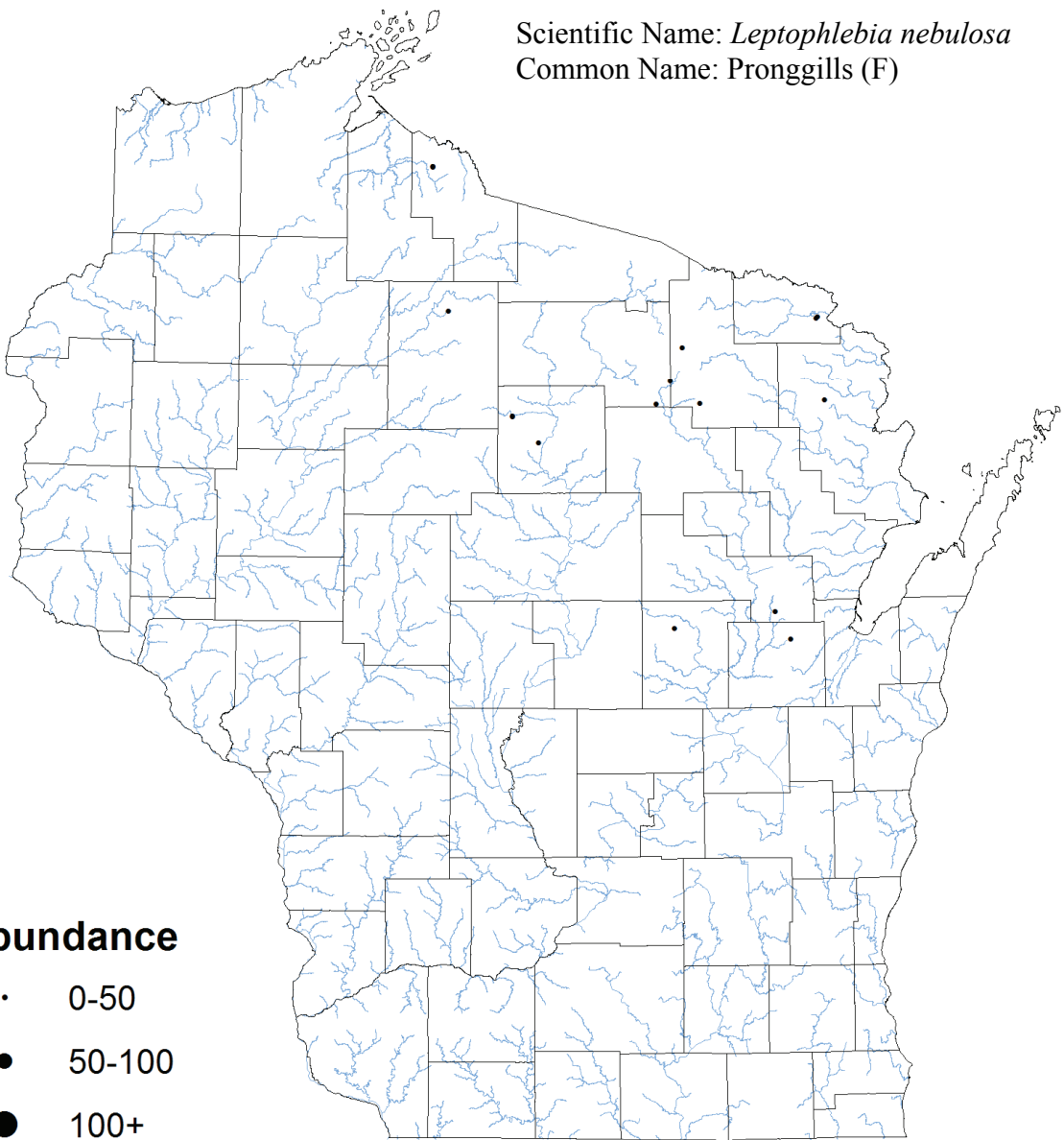


# Ephemeroptera Leptophlebiidae

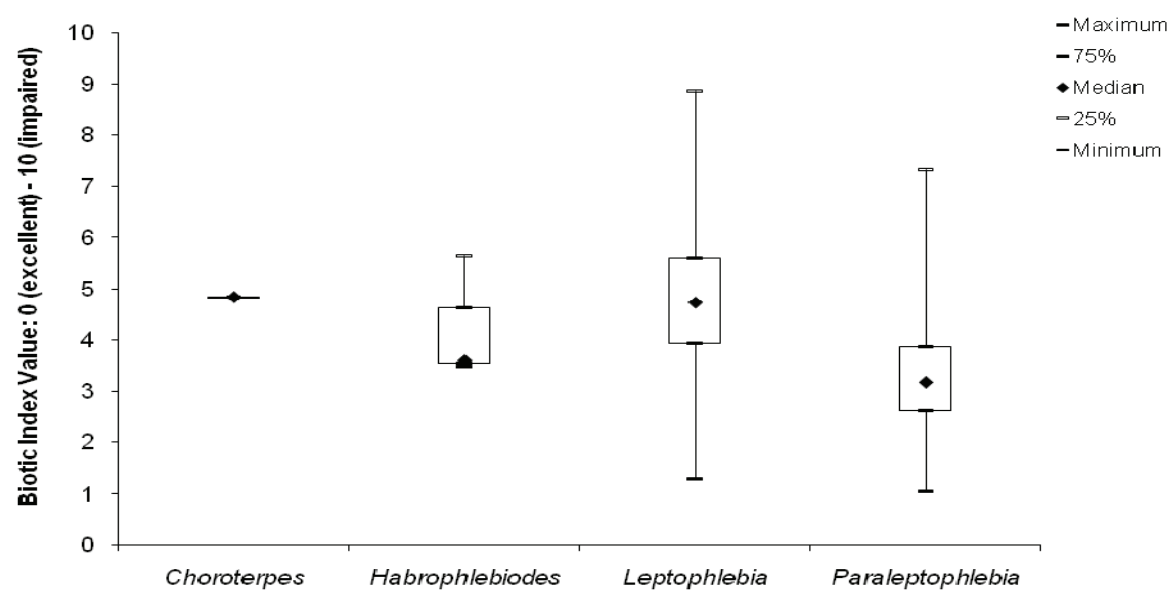
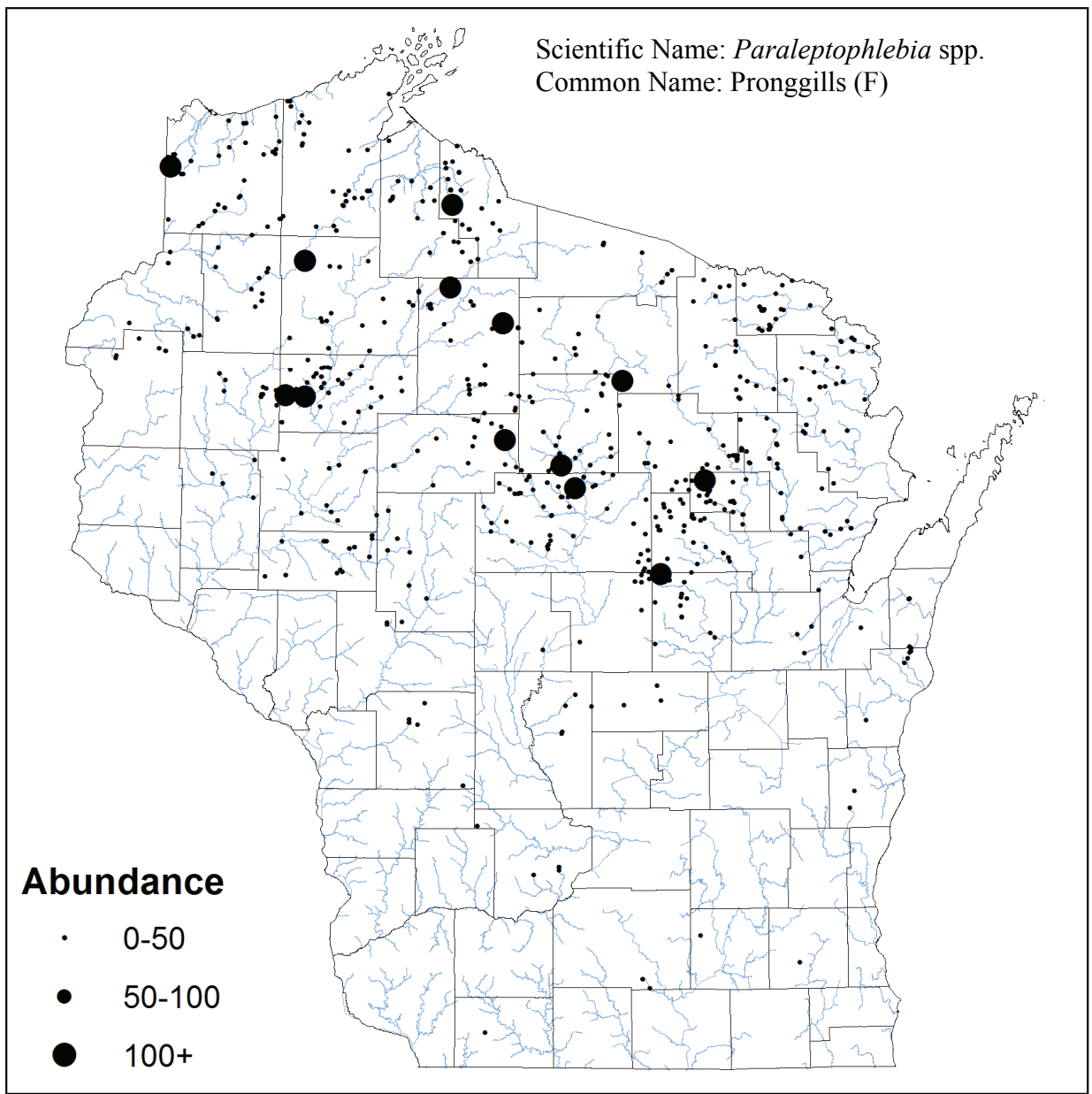
Scientific Name: *Leptophlebia nebulosa*  
Common Name: Pronggills (F)

## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Leptophlebiidae

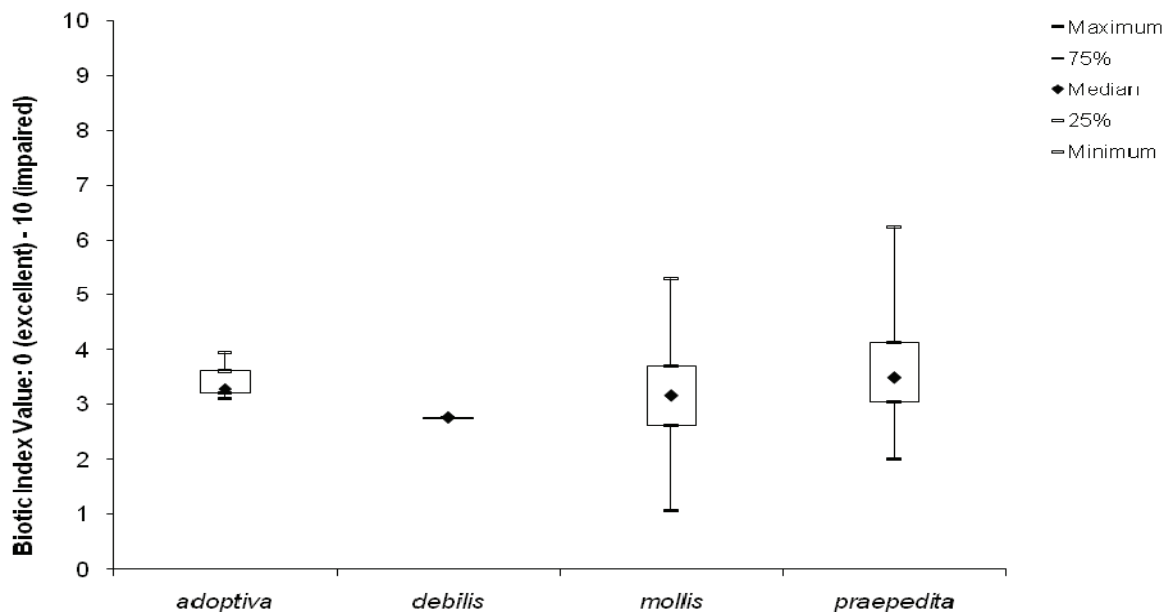
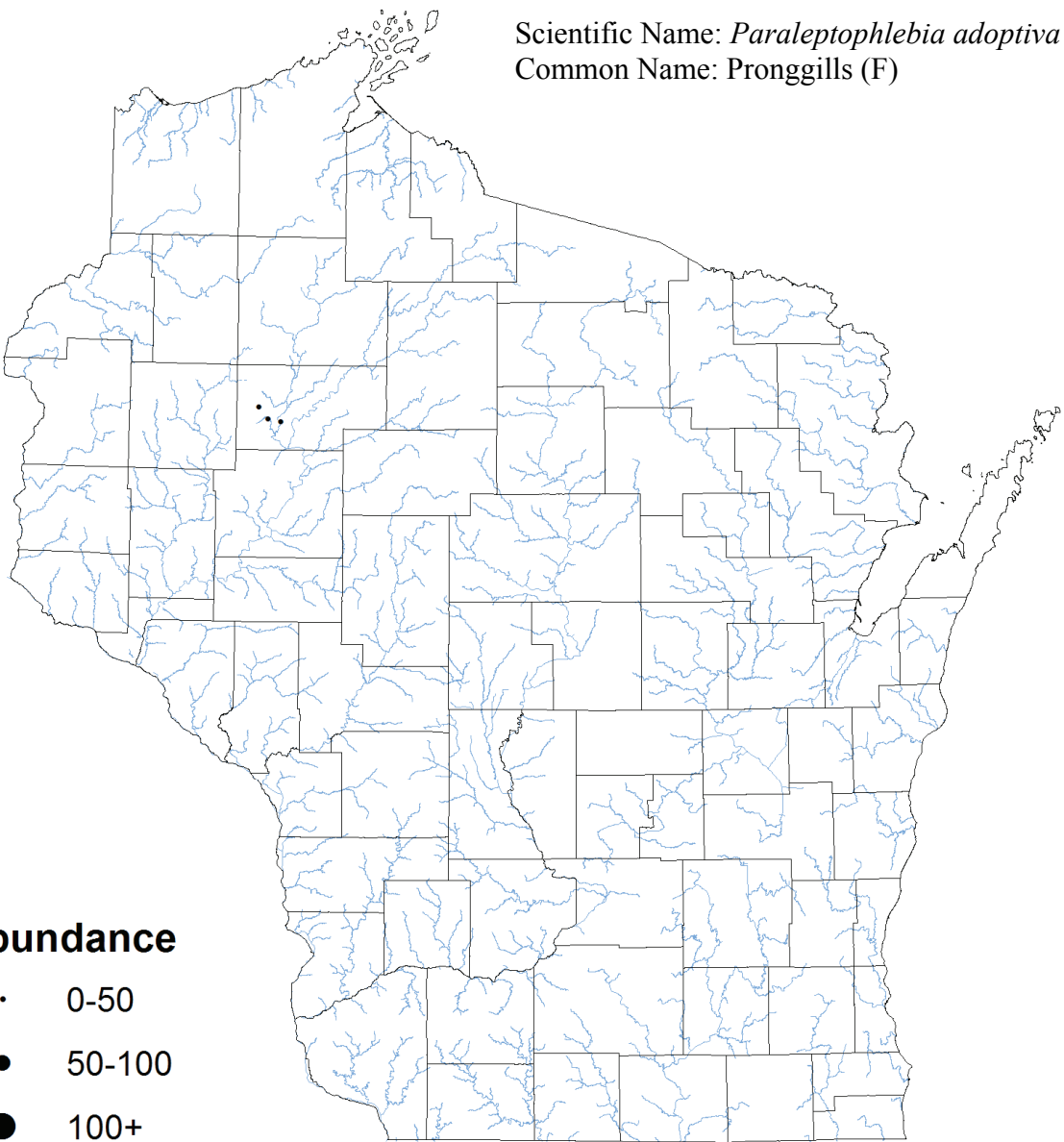


# Ephemeroptera Leptophlebiidae

Scientific Name: *Paraleptophlebia adoptiva*  
 Common Name: Pronggills (F)

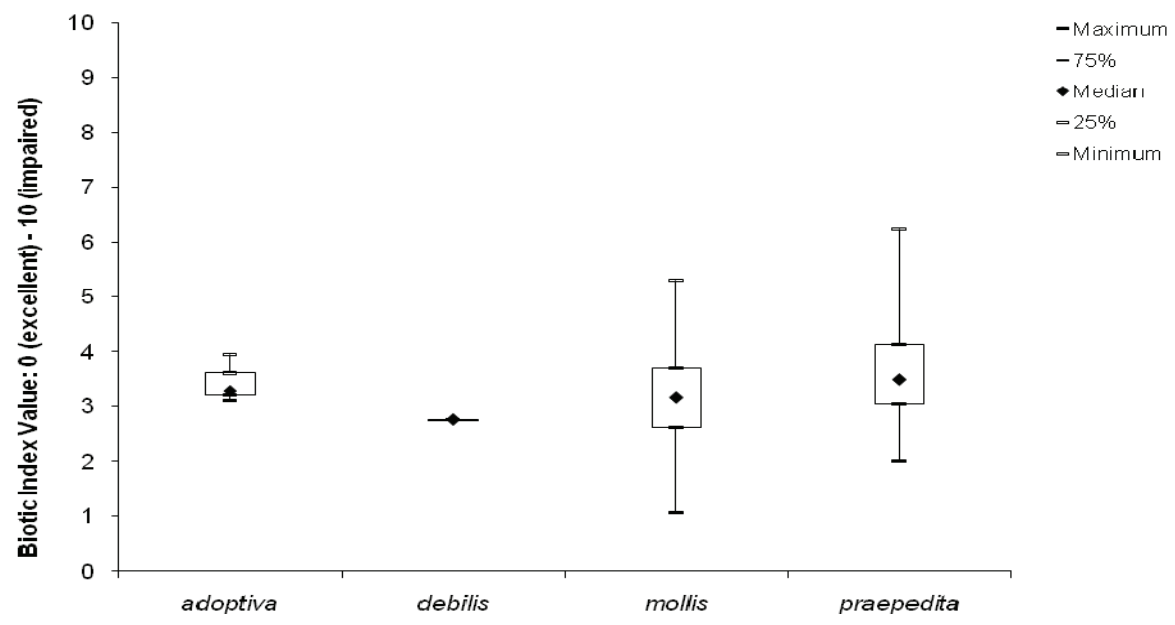
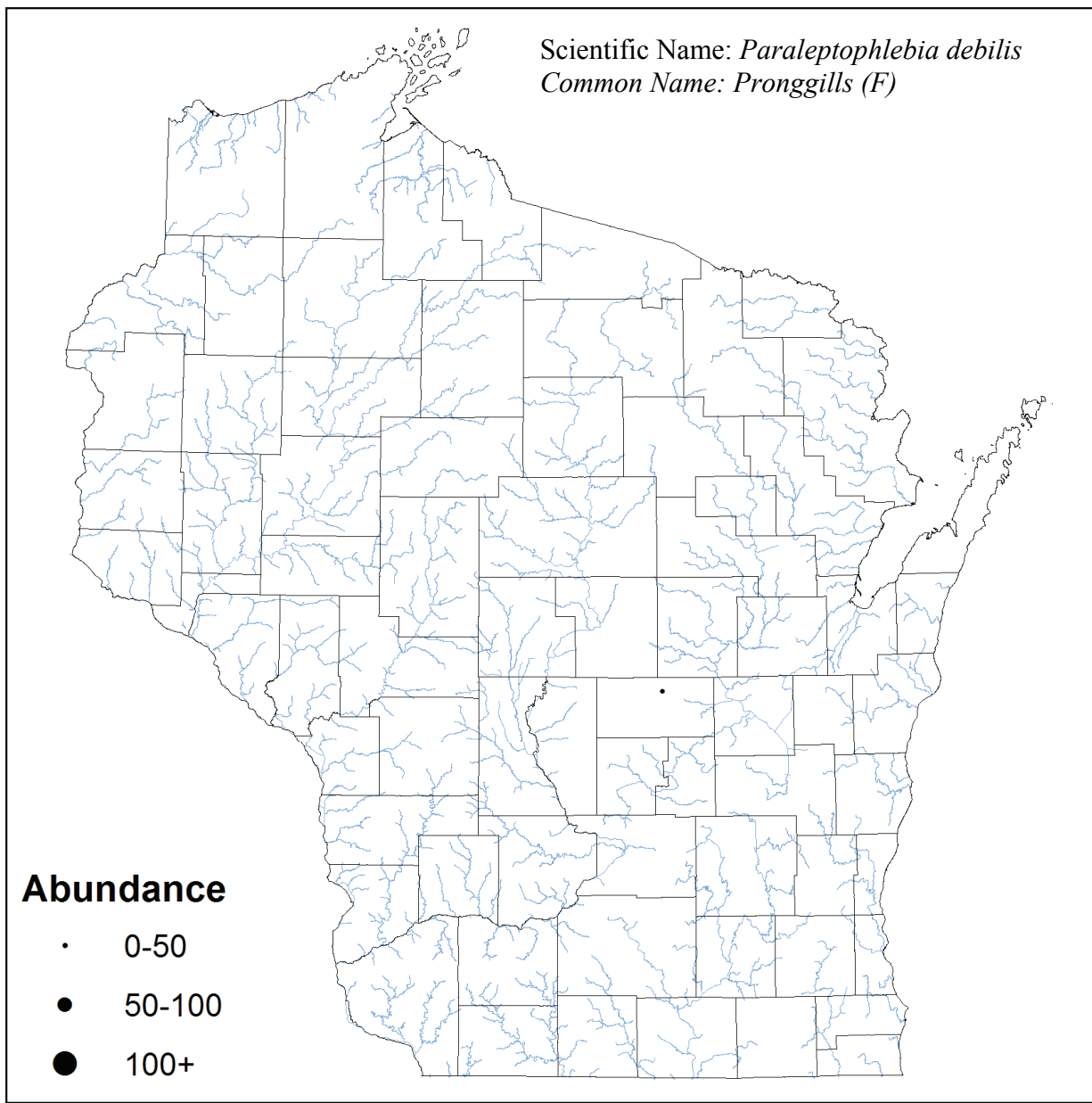
## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Leptophlebiidae

Scientific Name: *Paraleptophlebia debilis*  
 Common Name: Pronggills (F)

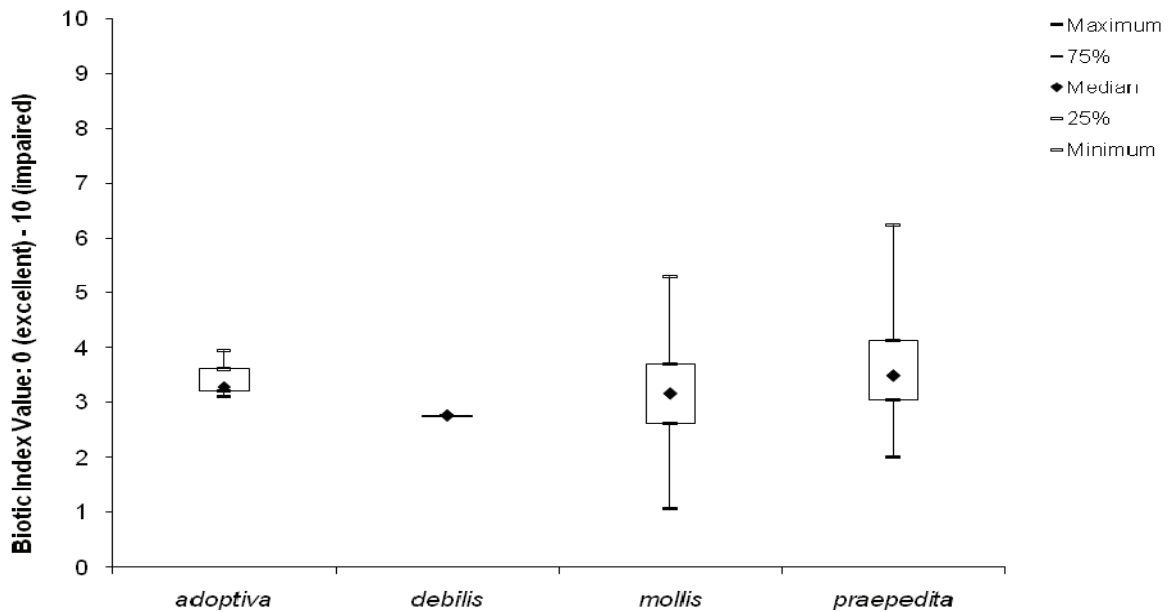
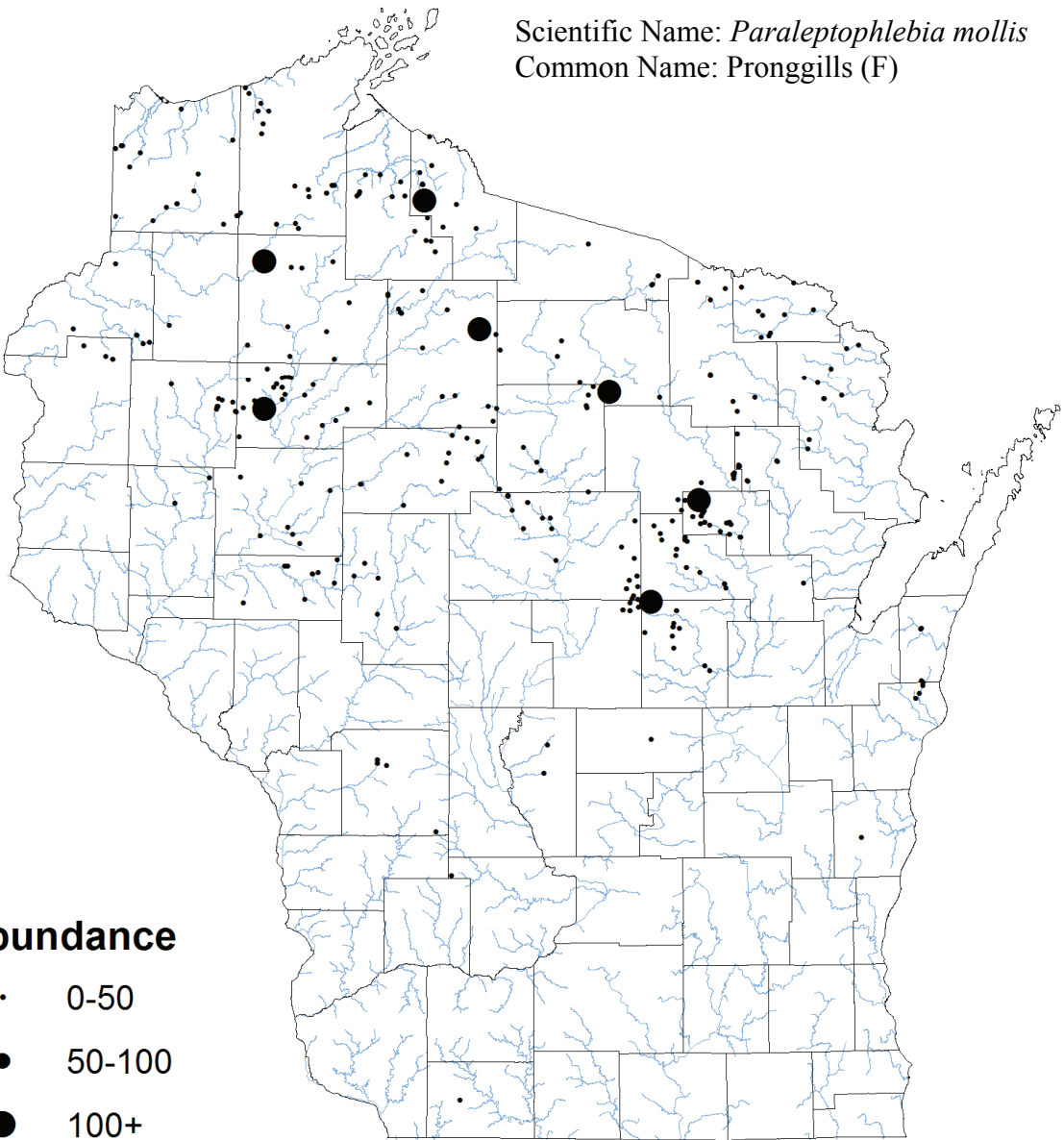


# Ephemeroptera Leptophlebiidae

Scientific Name: *Paraleptophlebia mollis*  
 Common Name: Pronggills (F)

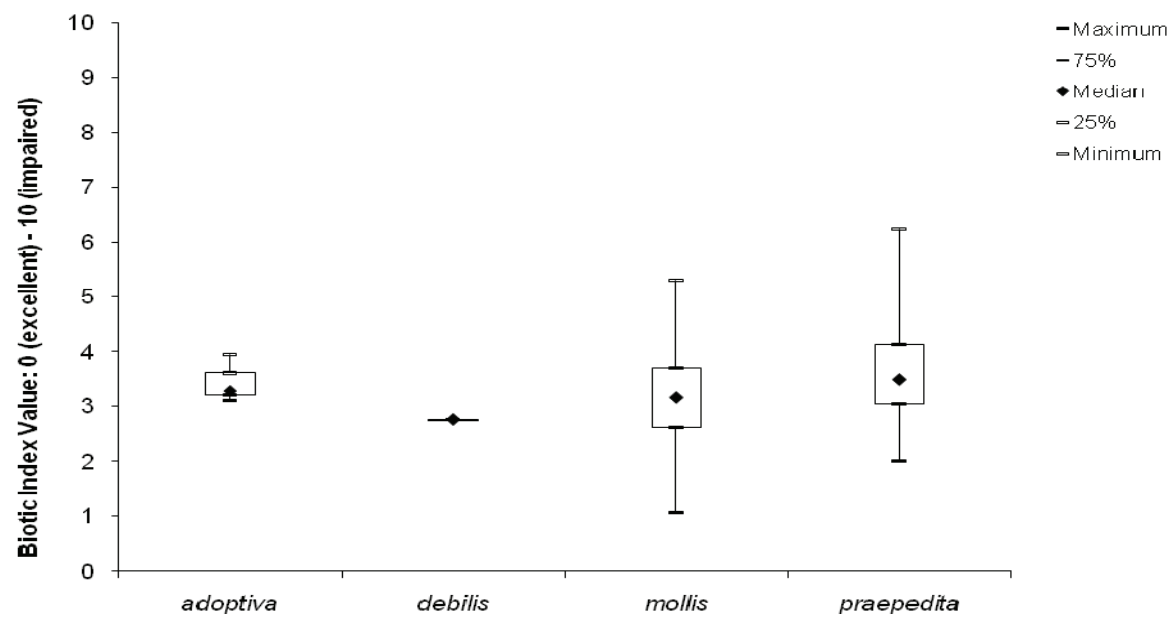
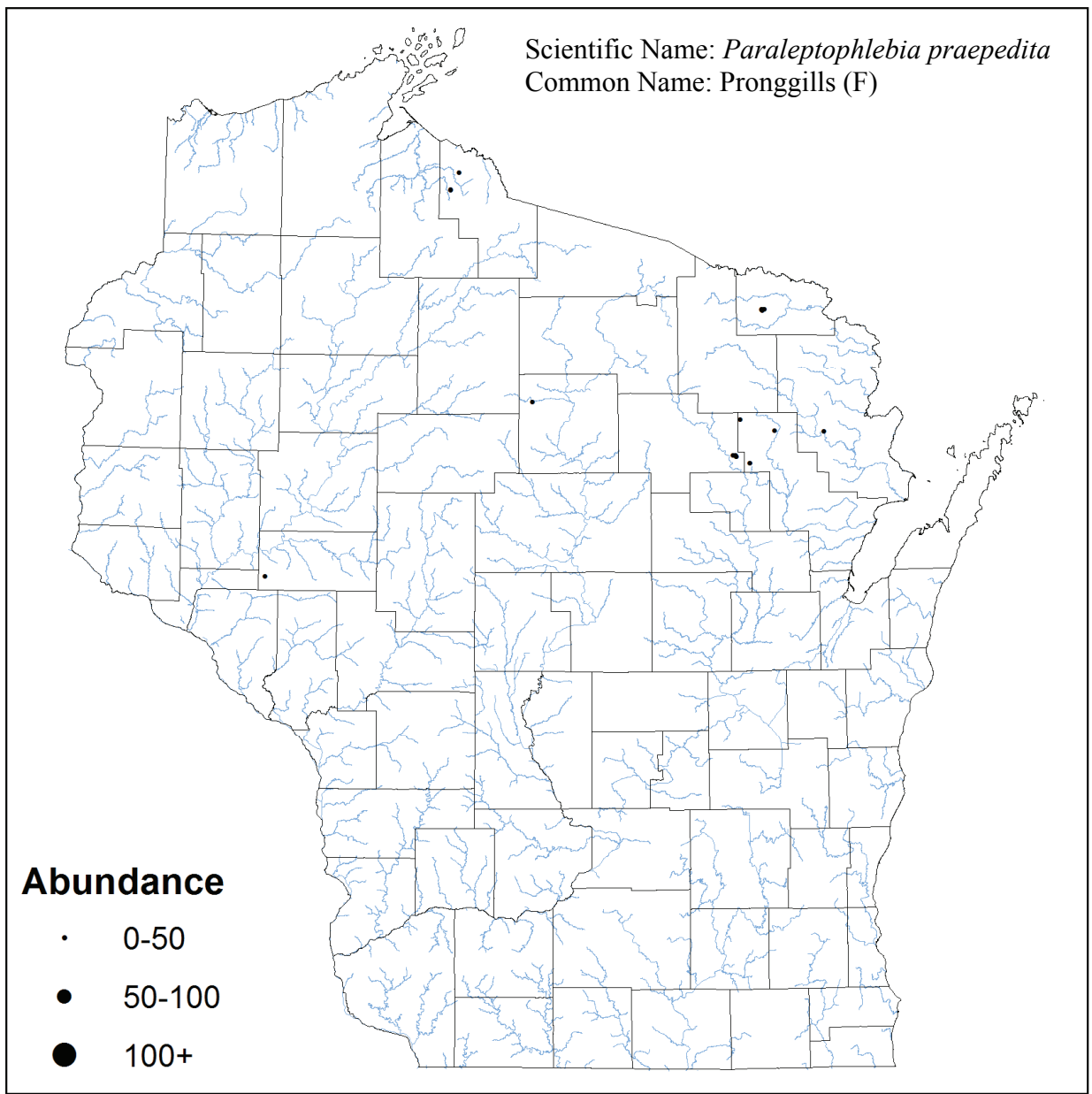
## Abundance

- 0-50
- 50-100
- 100+



# Ephemeroptera Leptophlebiidae

Scientific Name: *Paraleptophlebia praepedita*  
 Common Name: Pronggills (F)

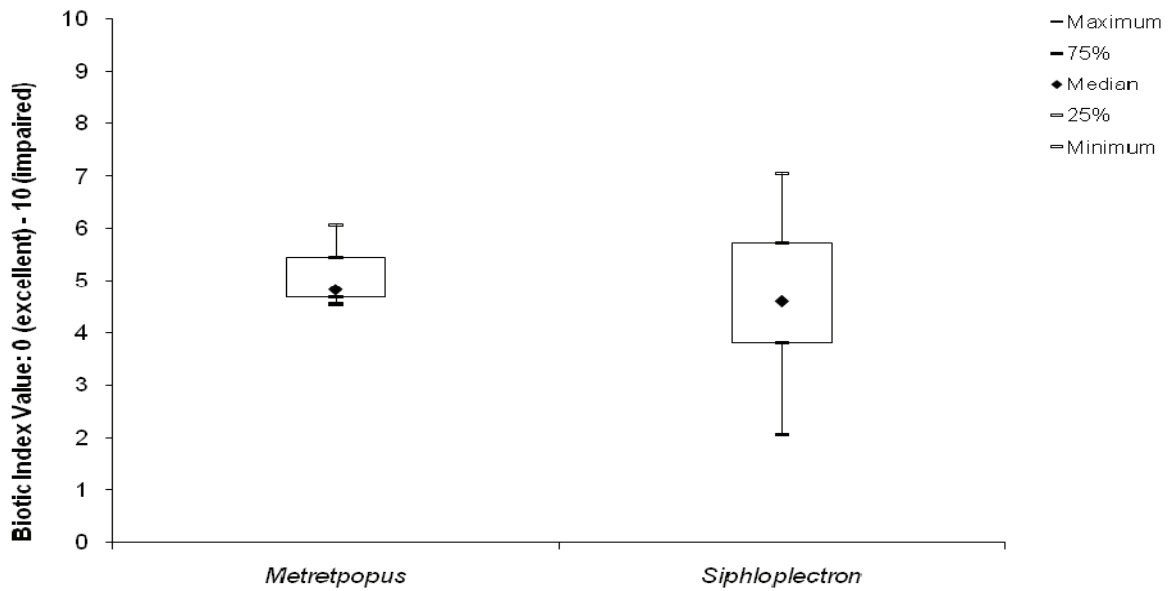
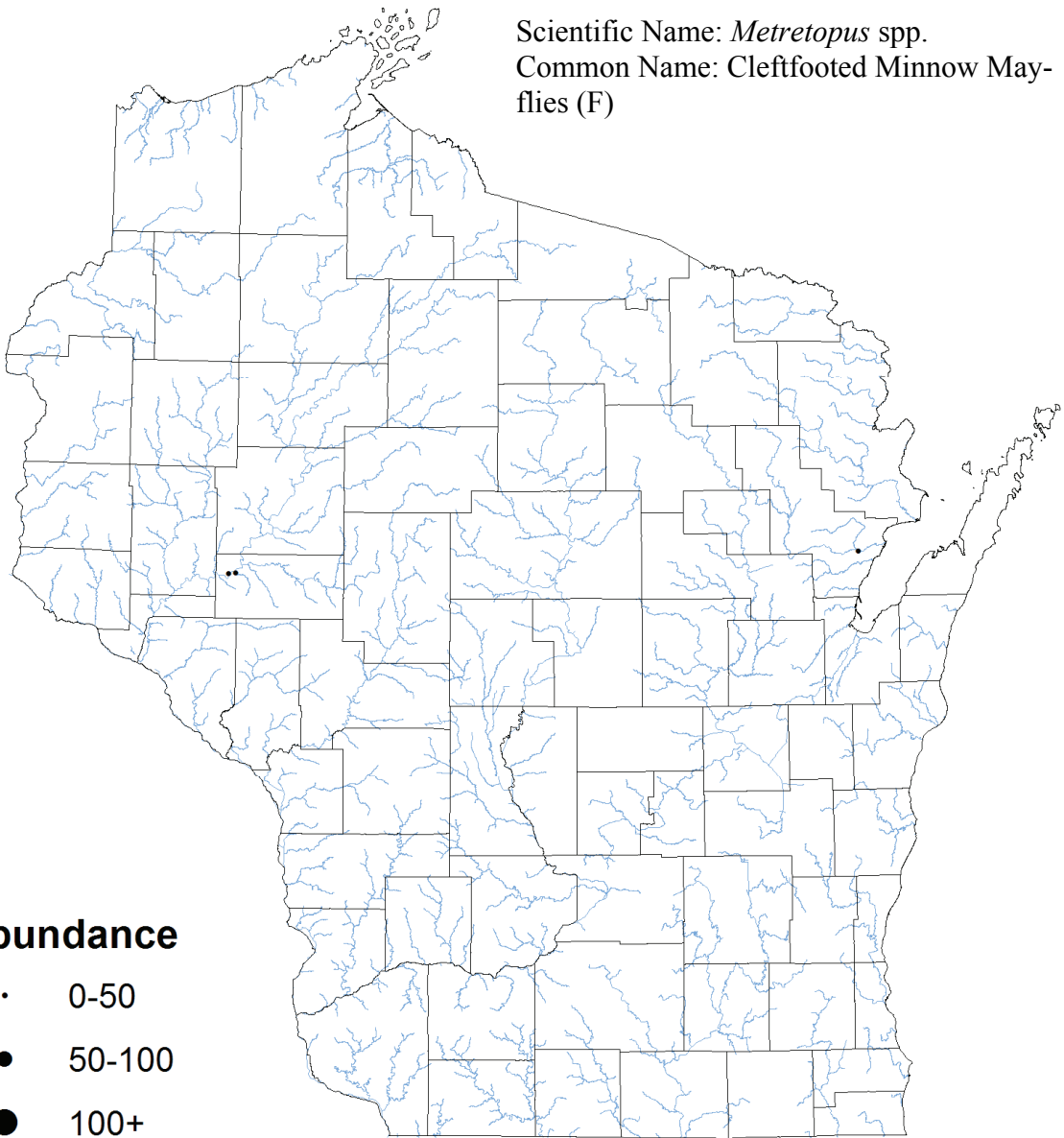


# Ephemeroptera Metretopodidae

Scientific Name: *Metretopus* spp.  
 Common Name: Cleftfooted Minnow Mayflies (F)

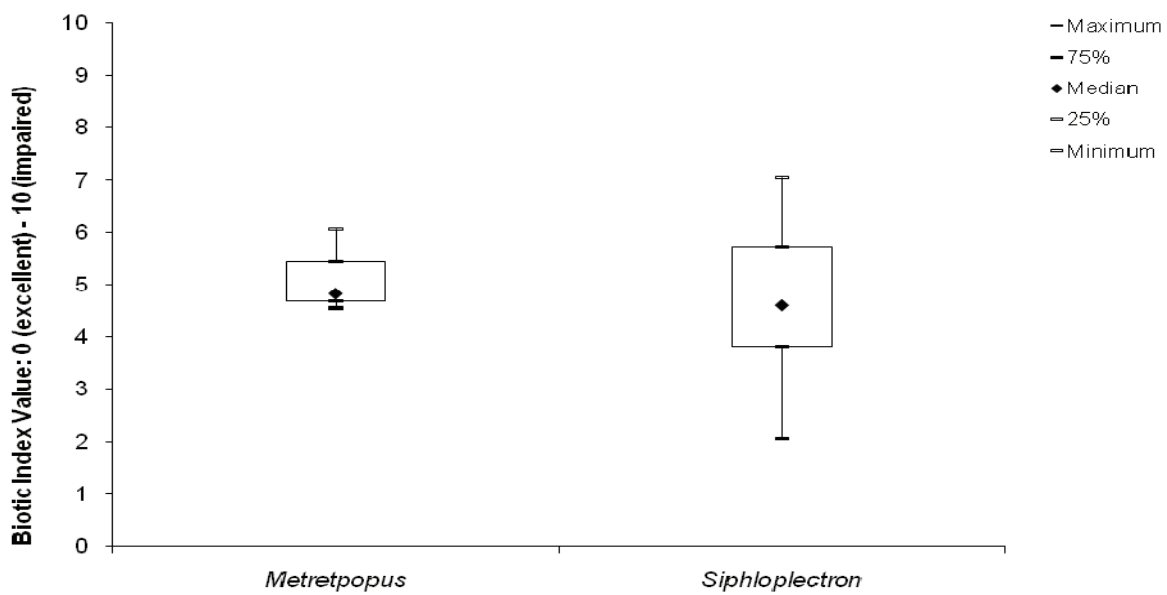
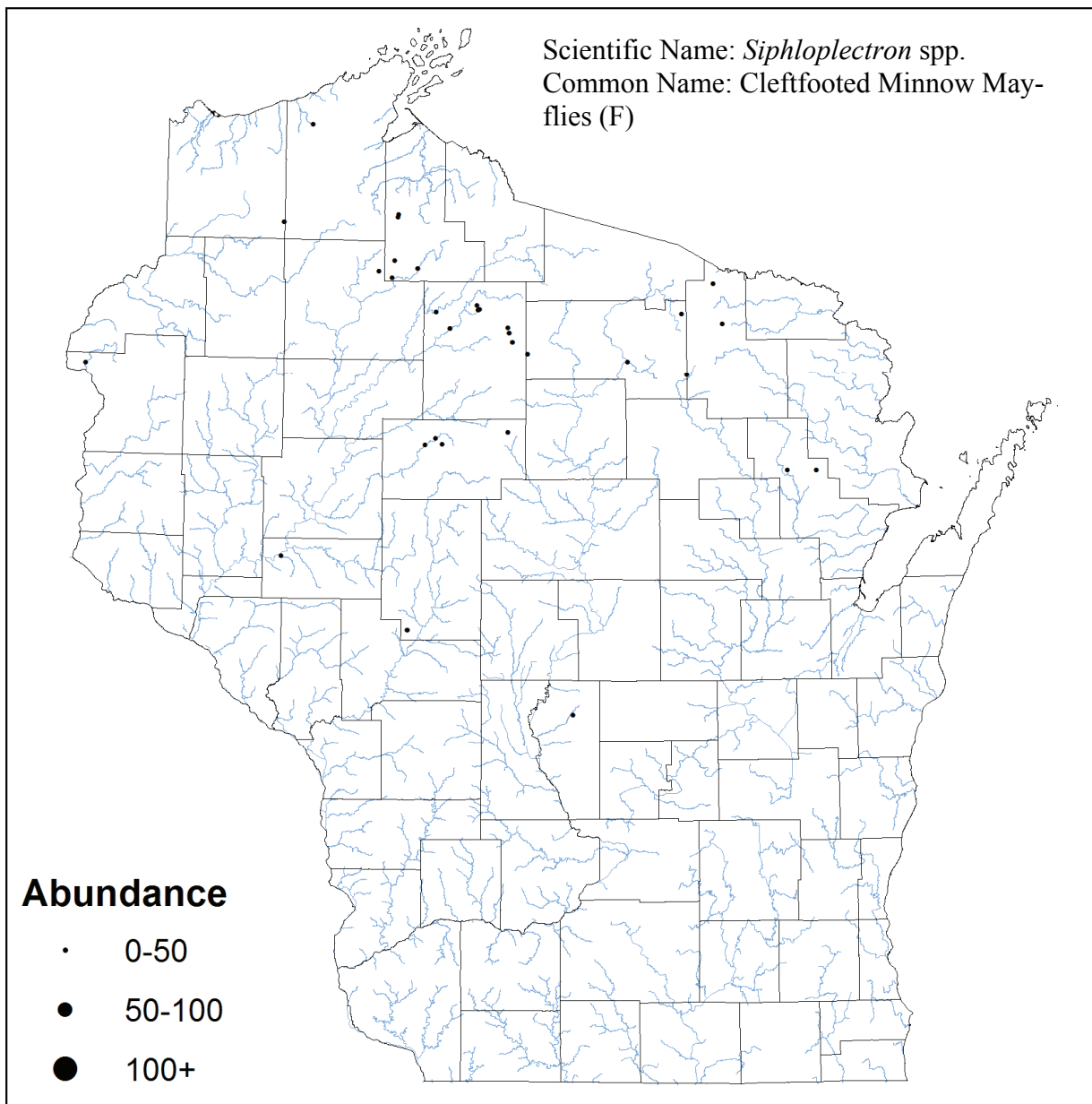
## Abundance

- 0-50
- 50-100
- 100+





# Ephemeroptera Metretopodidae

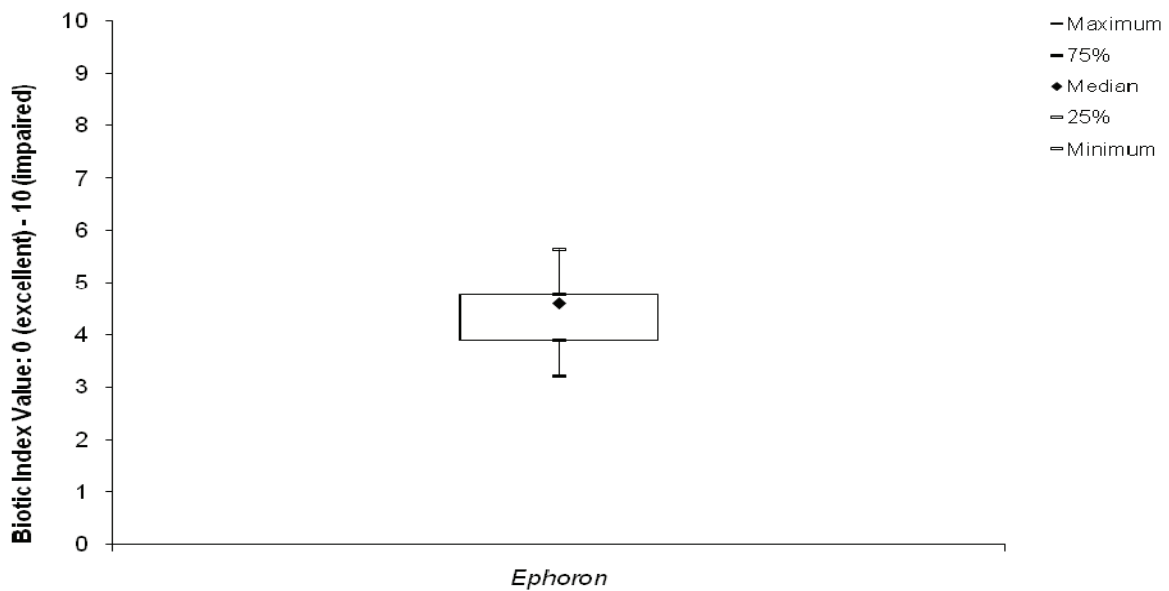
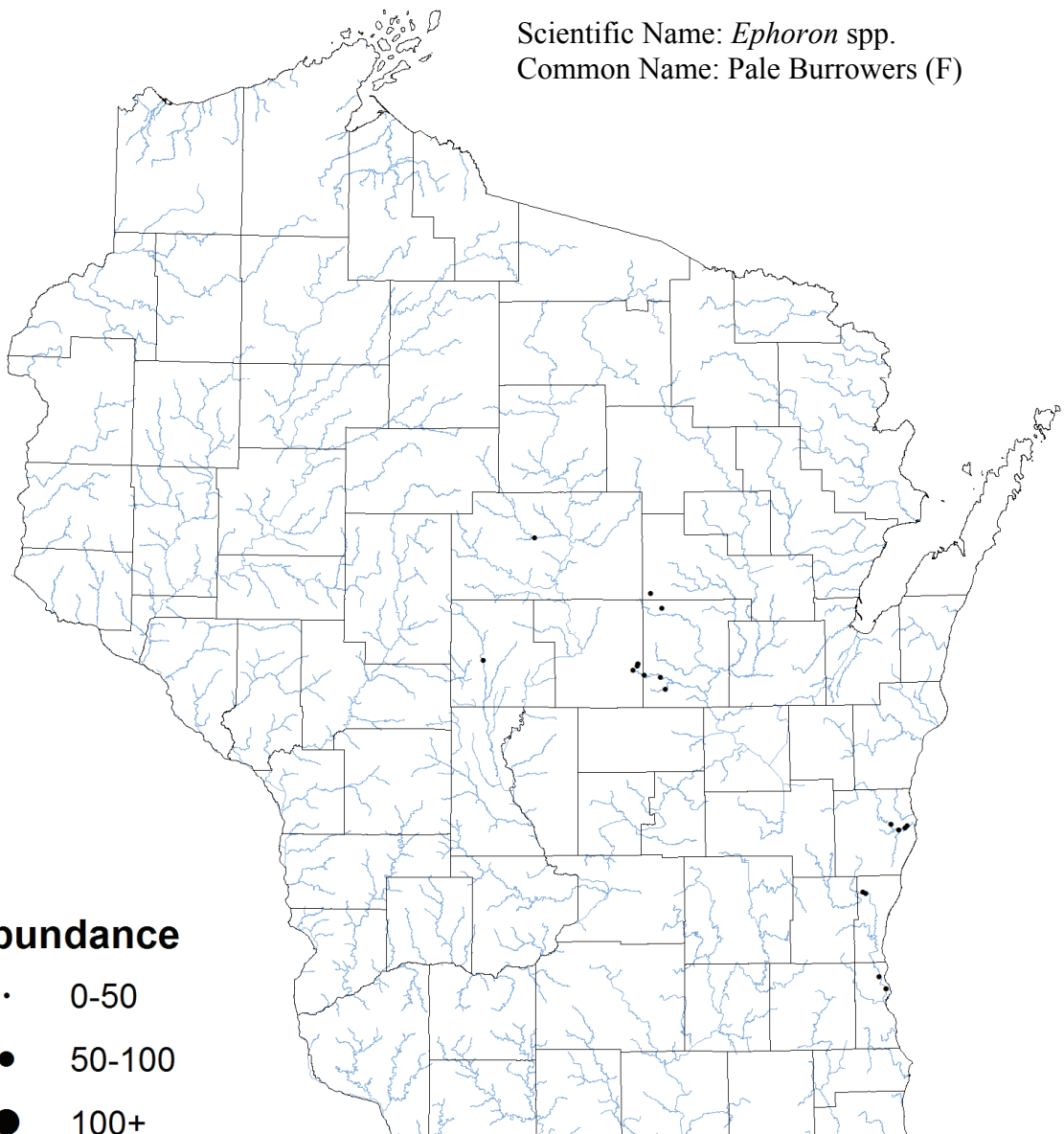


# Ephemeroptera Polymitarcidae

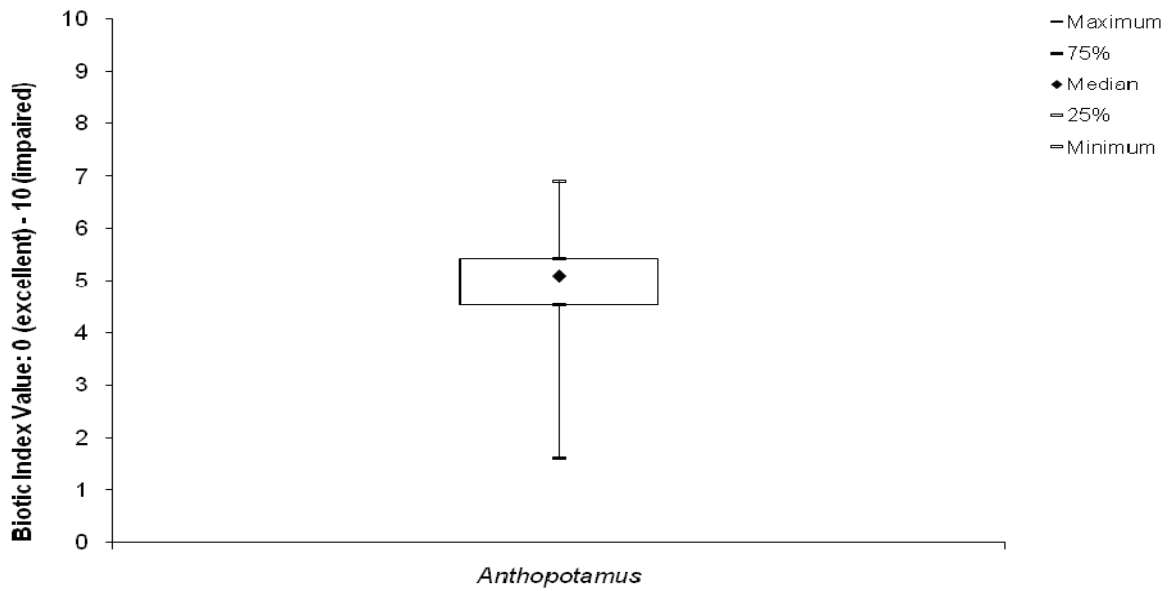
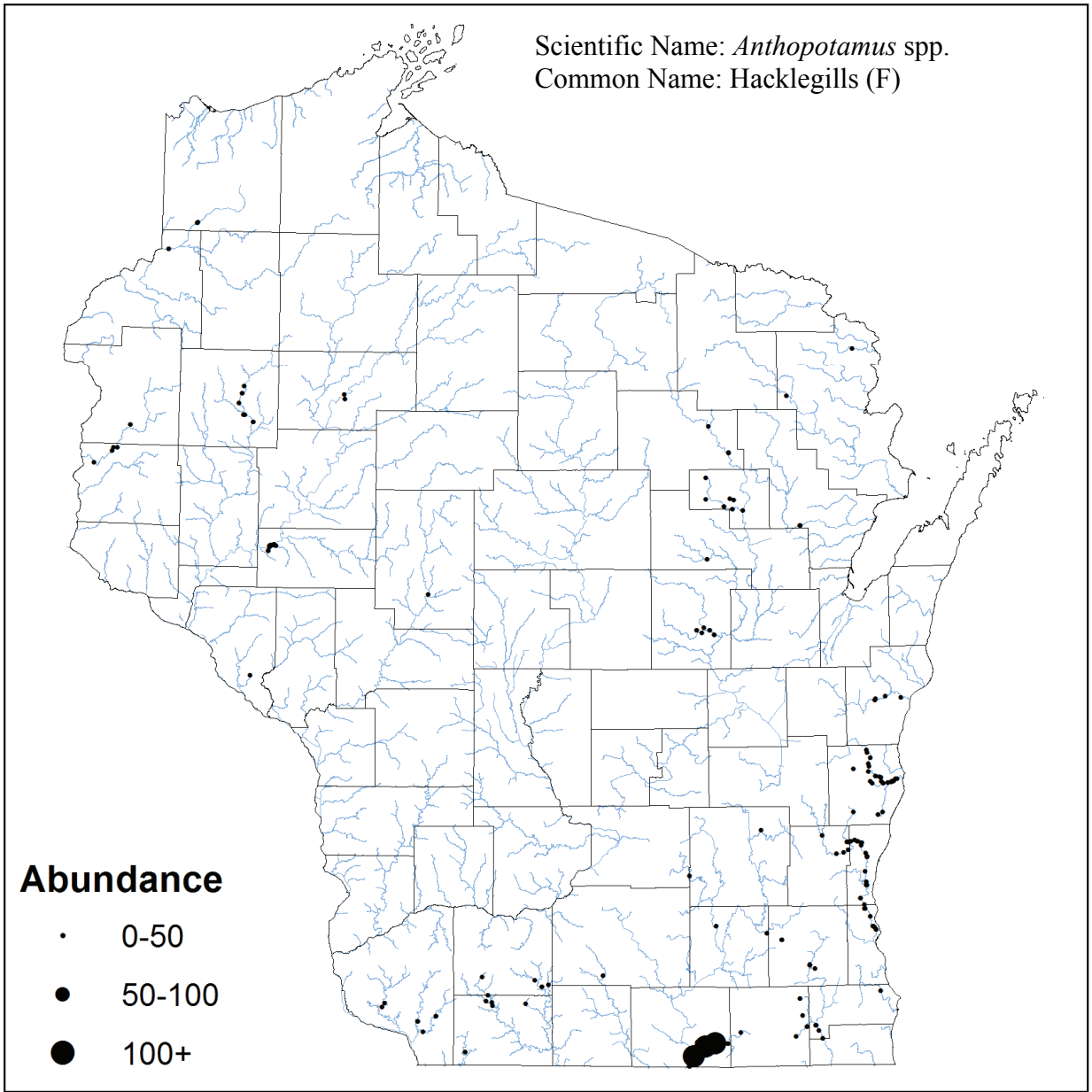
Scientific Name: *Ephoron* spp.  
Common Name: Pale Burrowers (F)

## Abundance

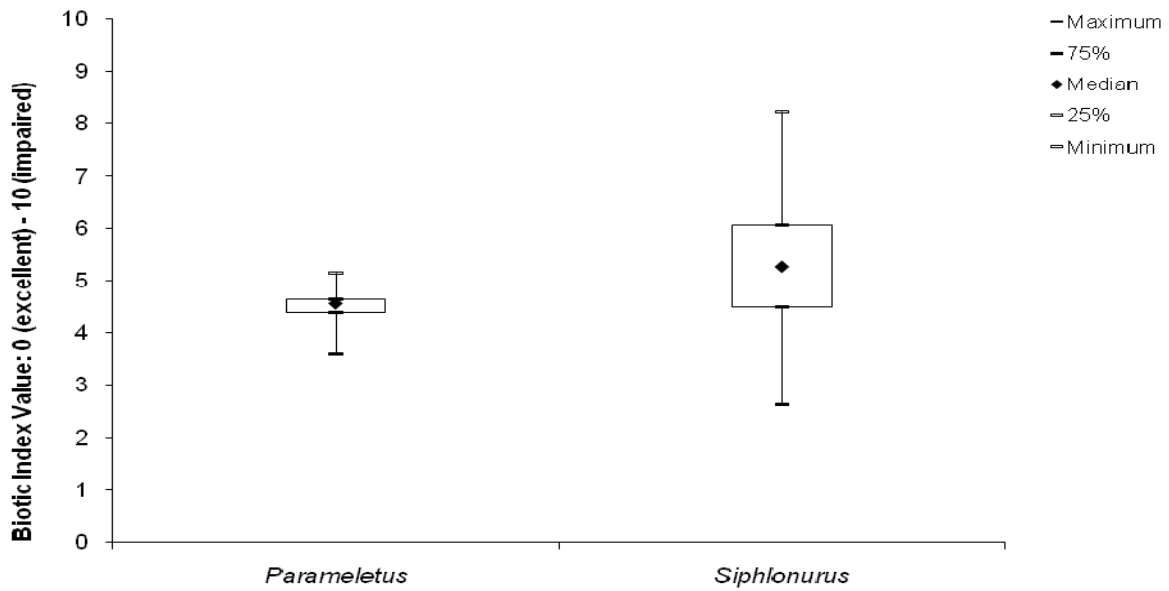
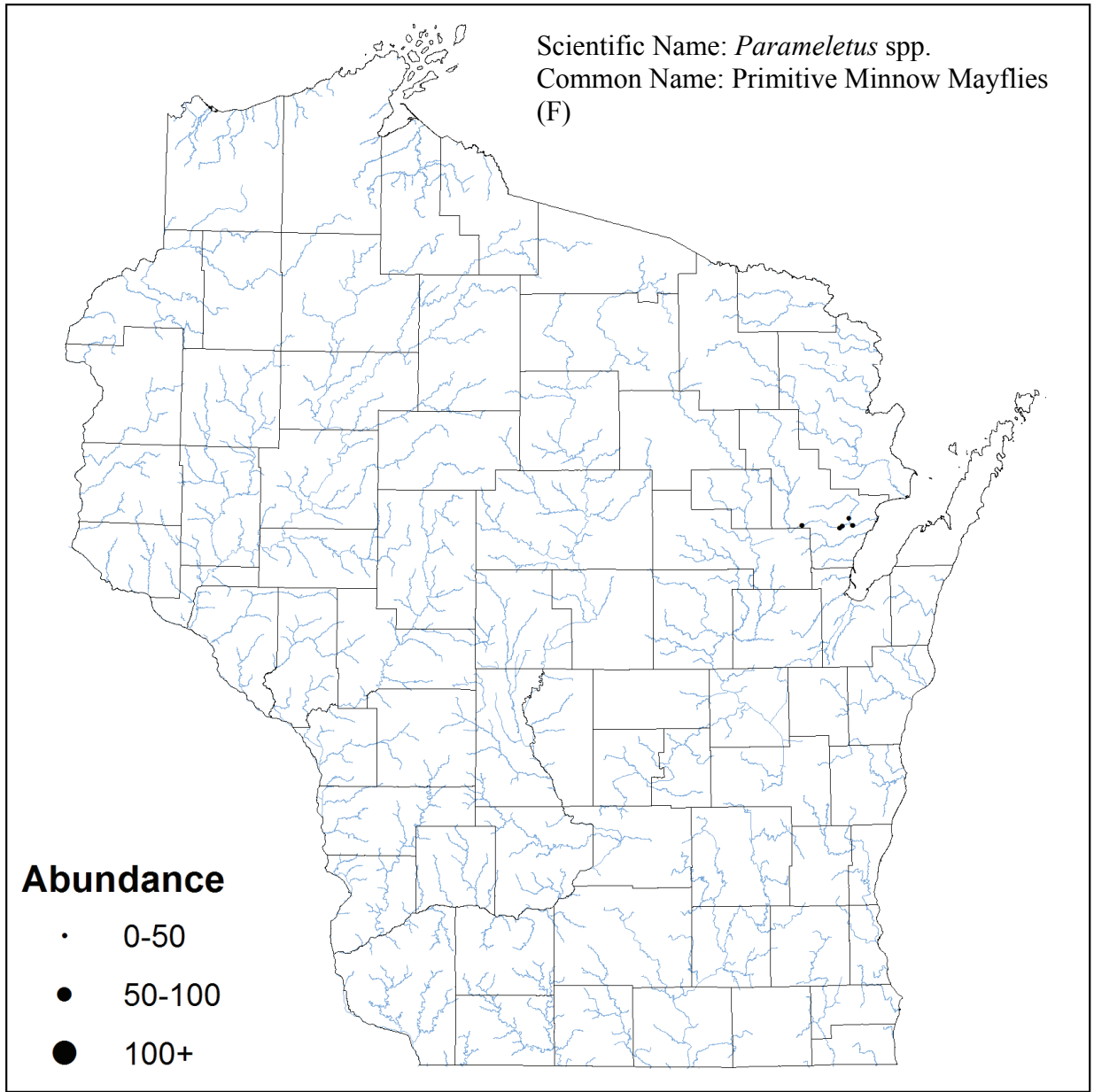
- 0-50
- 50-100
- 100+



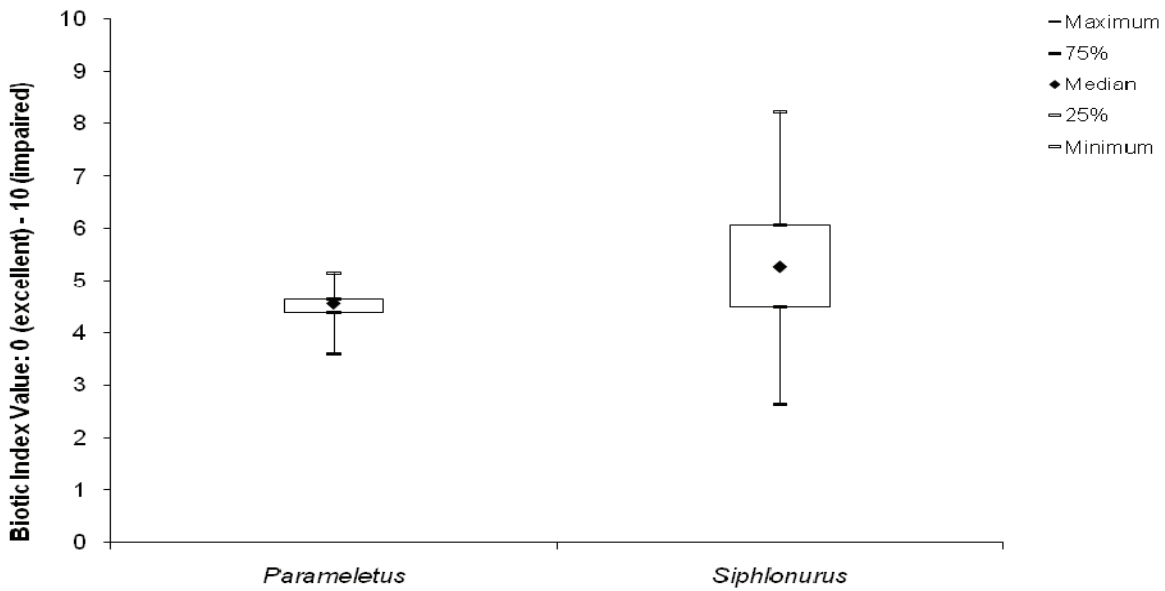
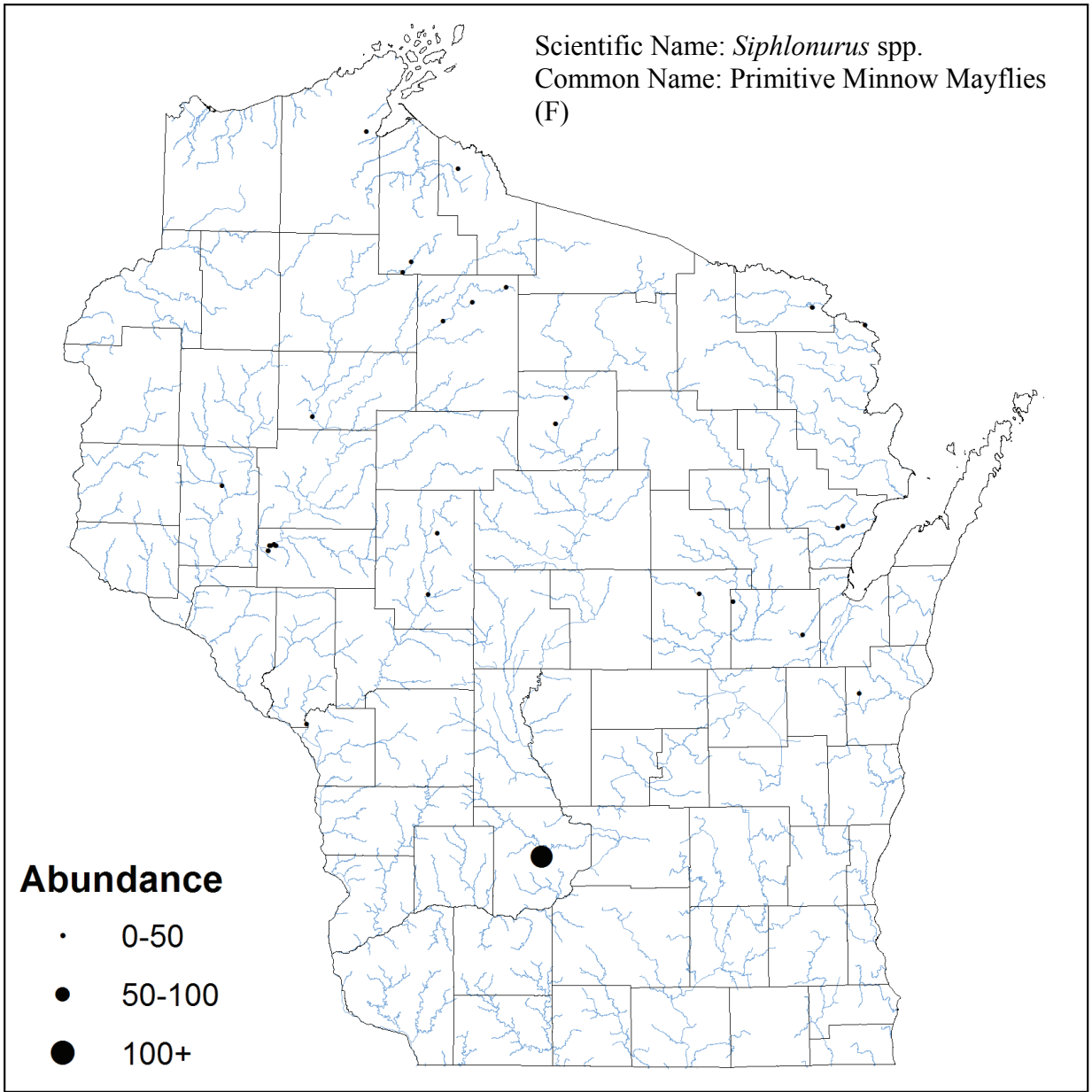
# Ephemeroptera Potamanthidae



# Ephemeroptera Siphonuridae



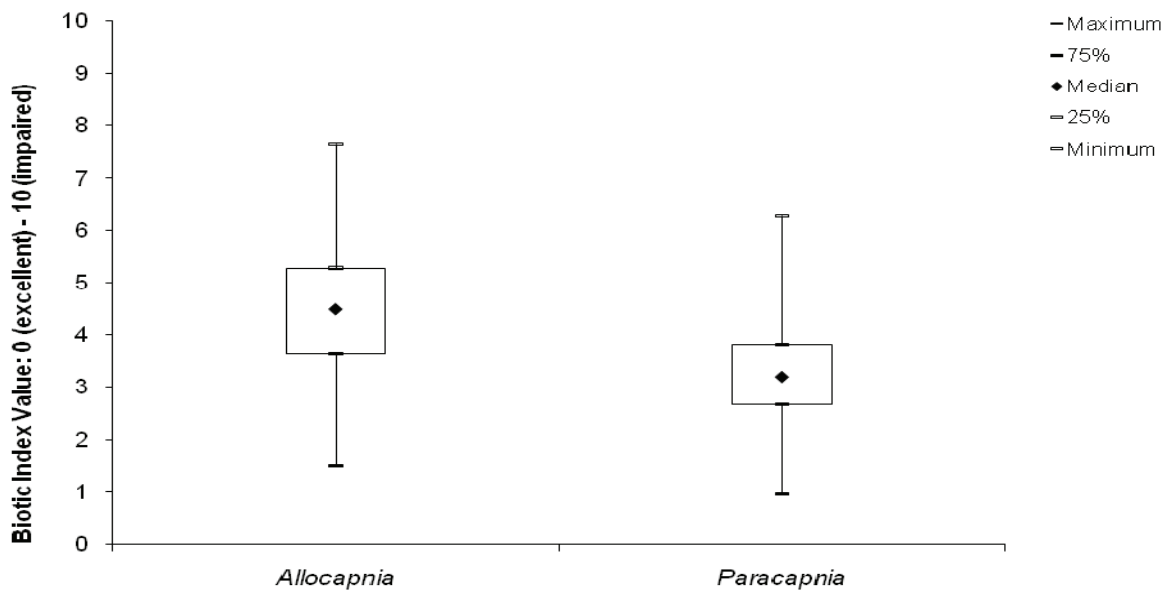
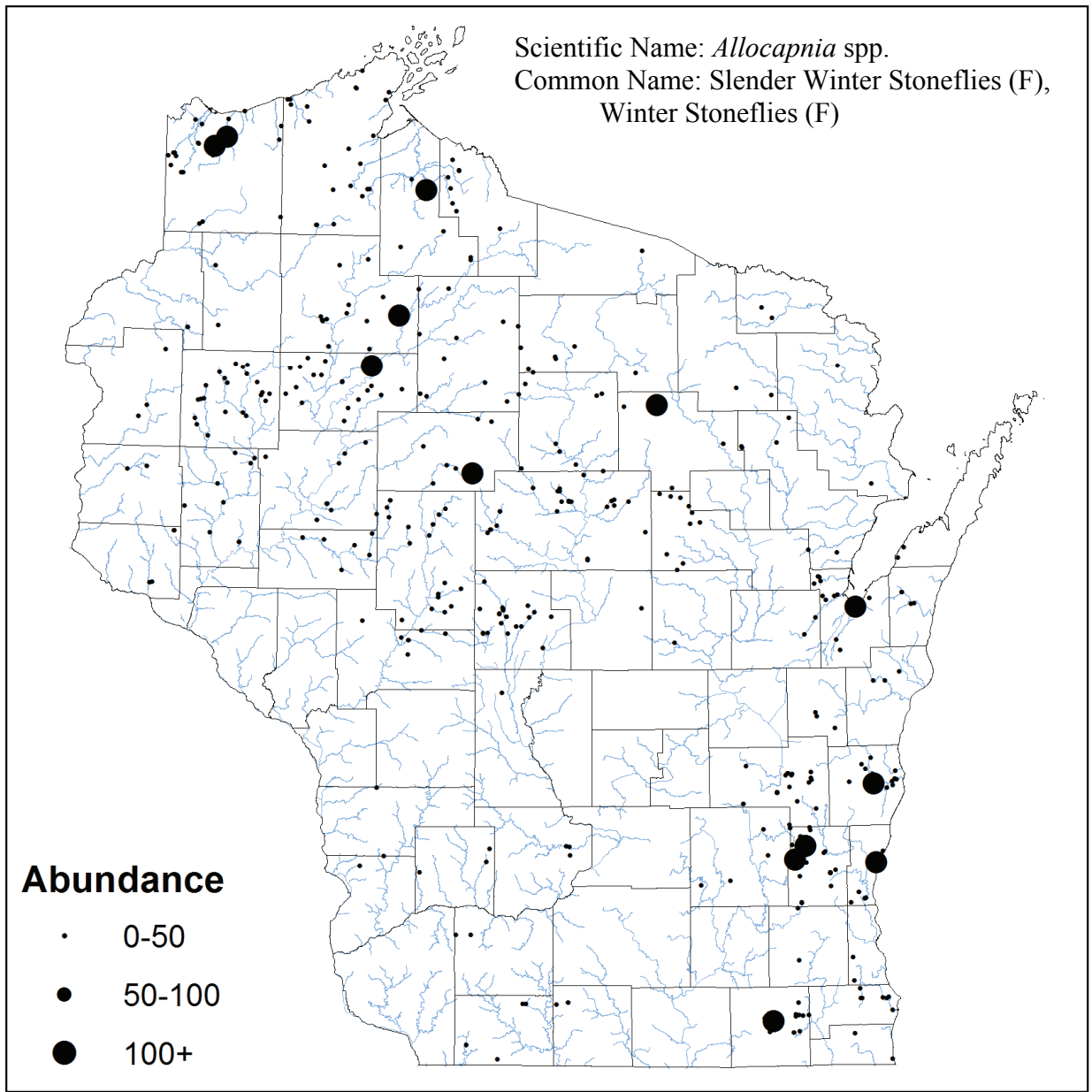
# Ephemeroptera Siphonuridae



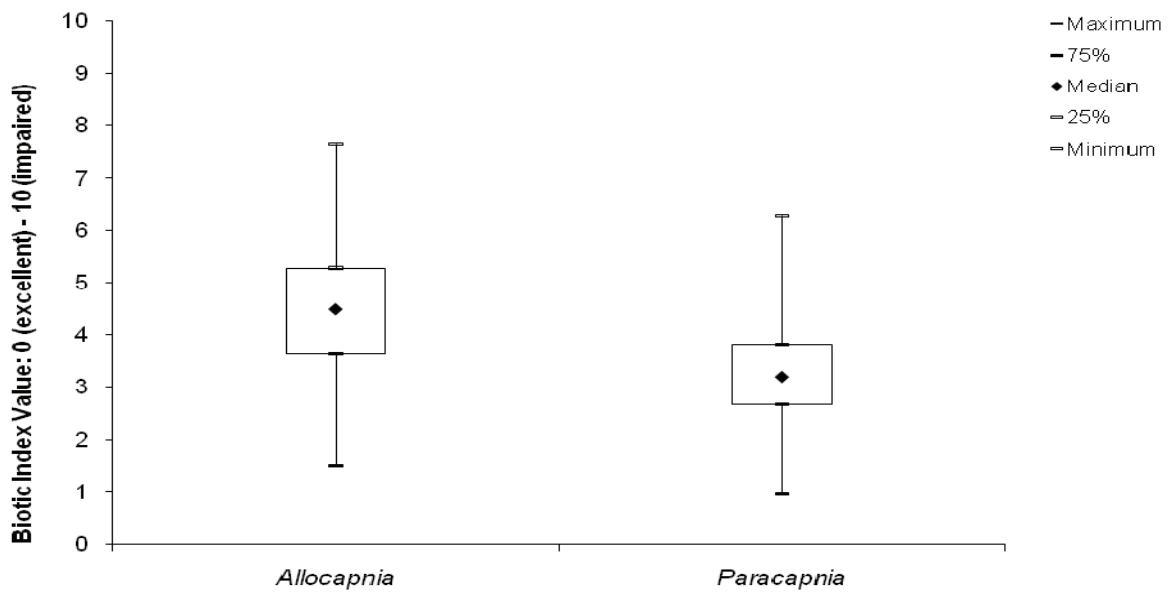
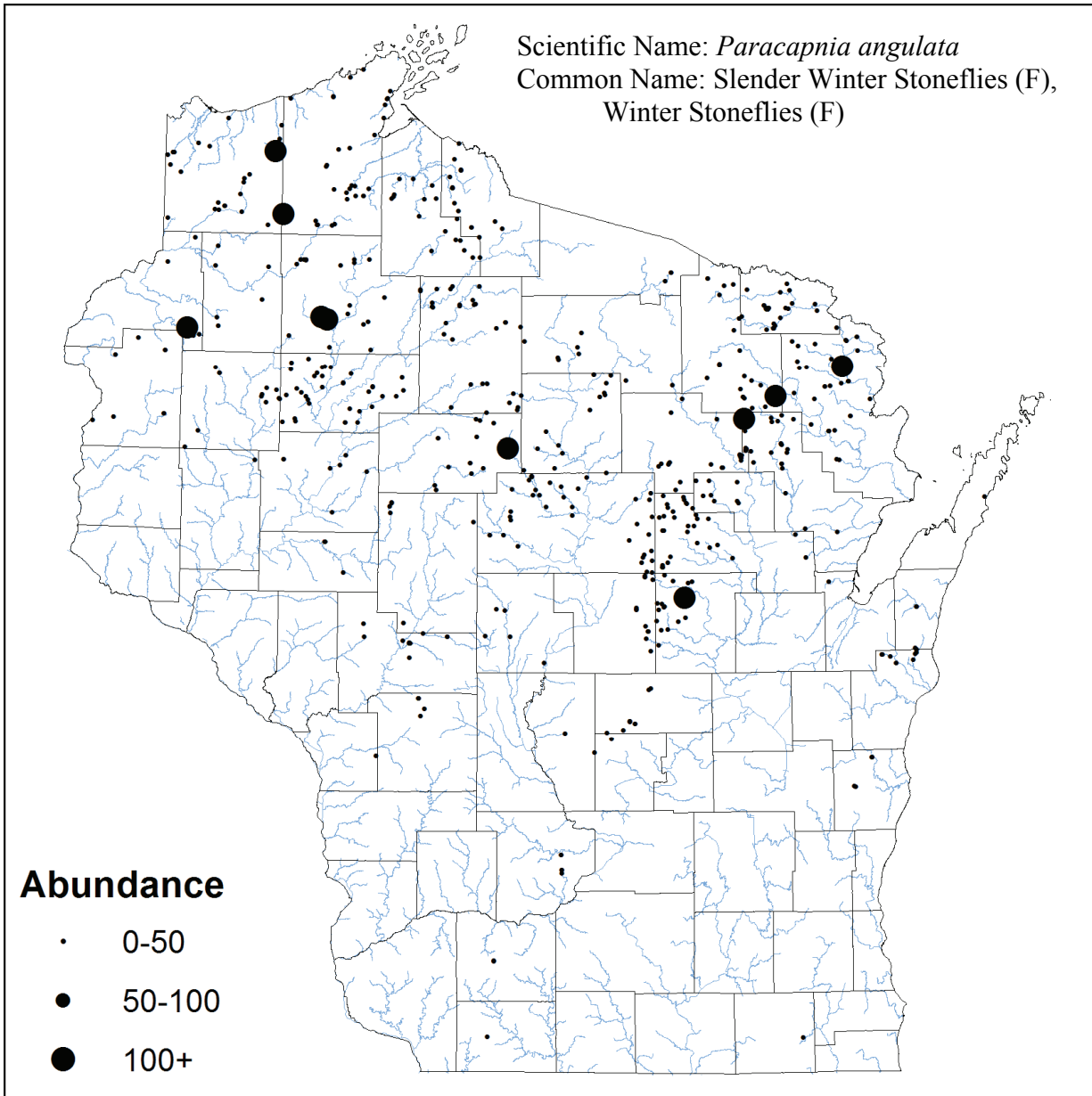


## Section II: Plecoptera (Stoneflies)

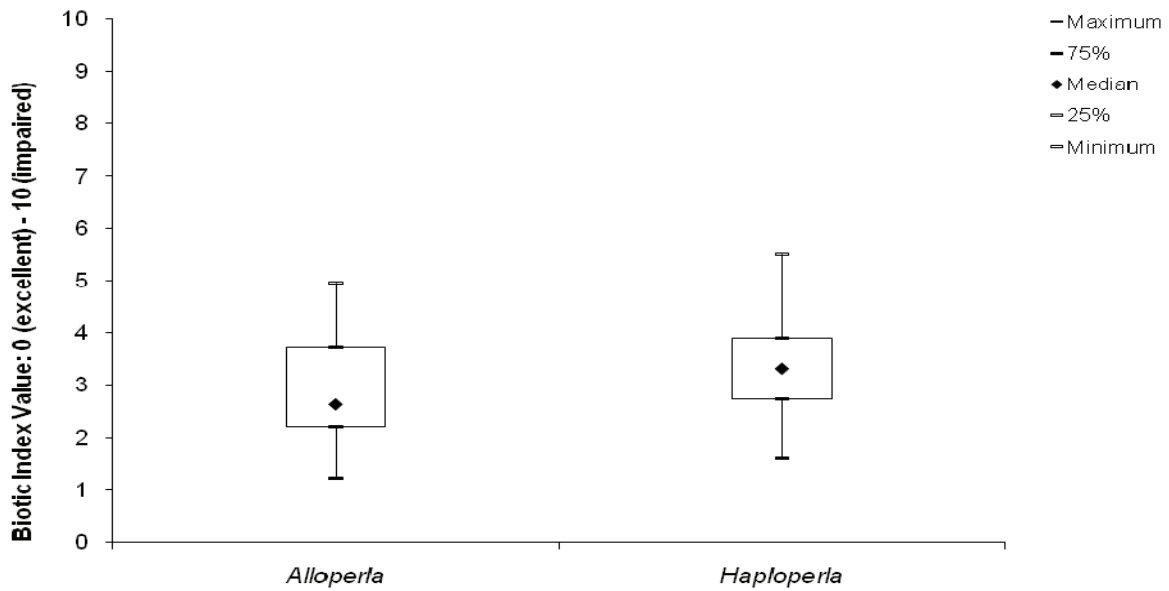
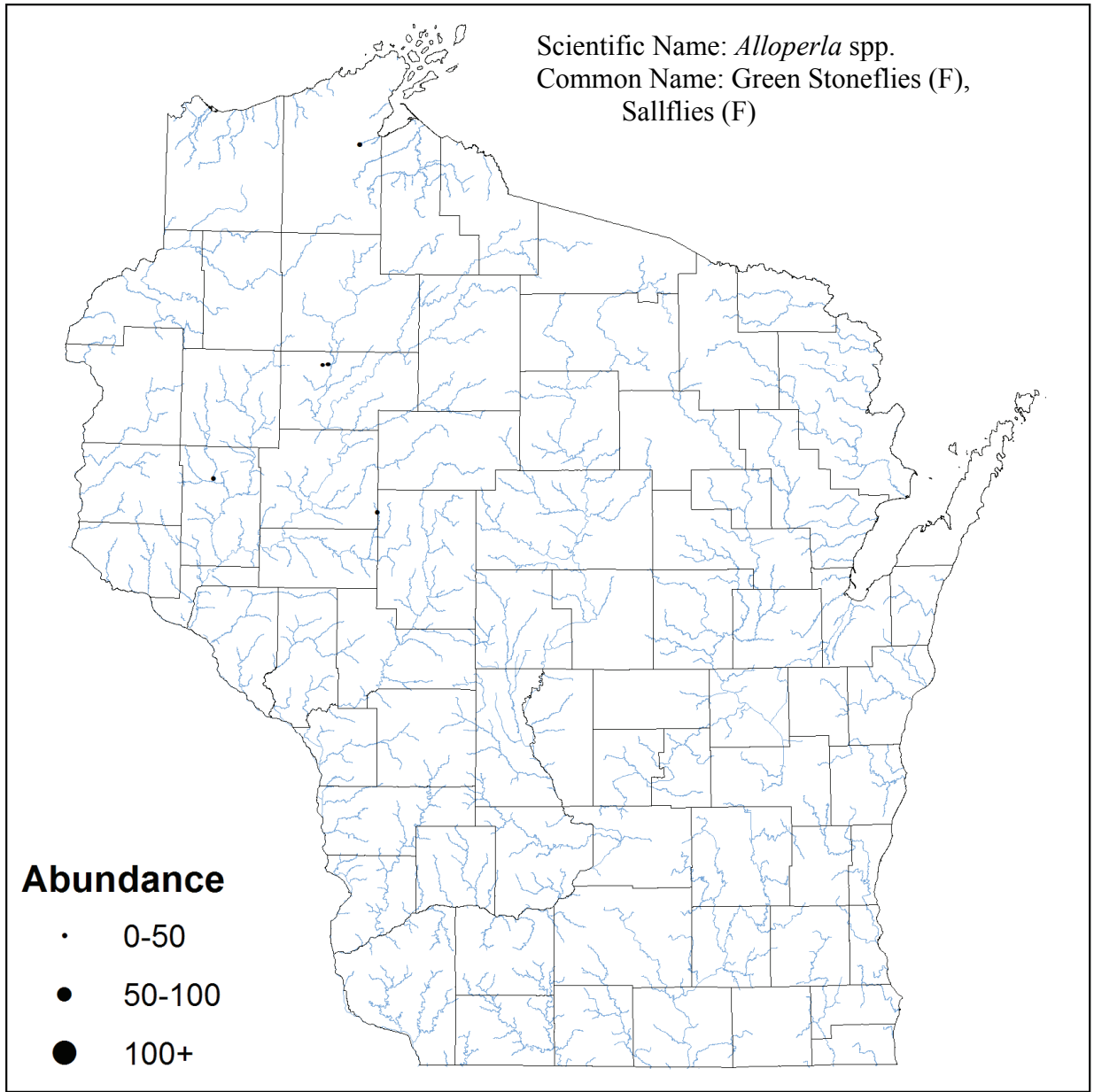
# Plecoptera Capniidae



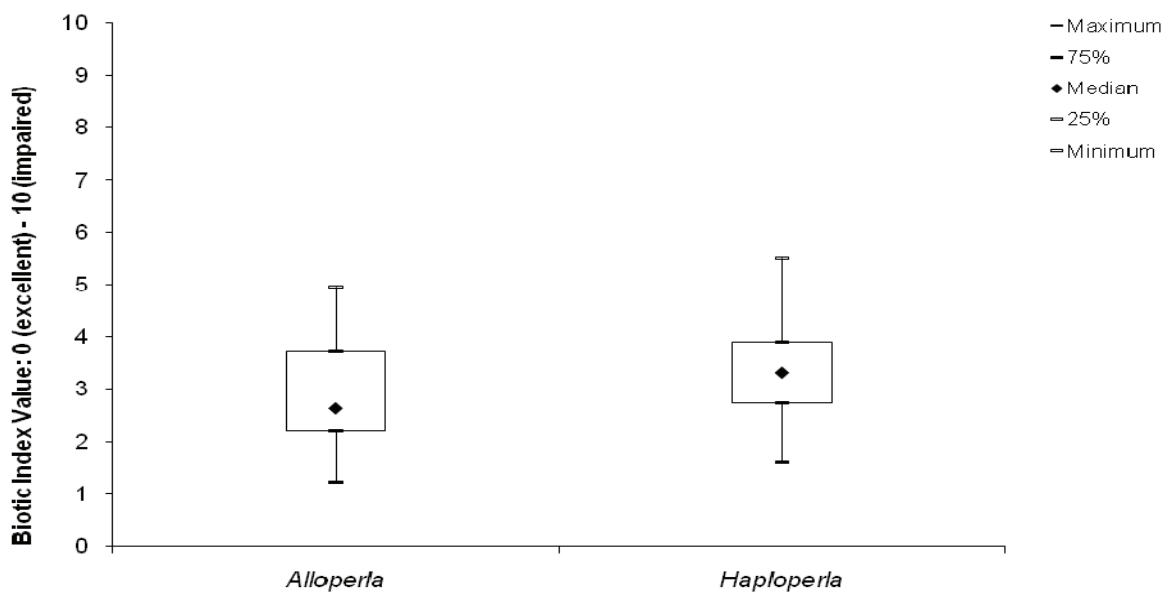
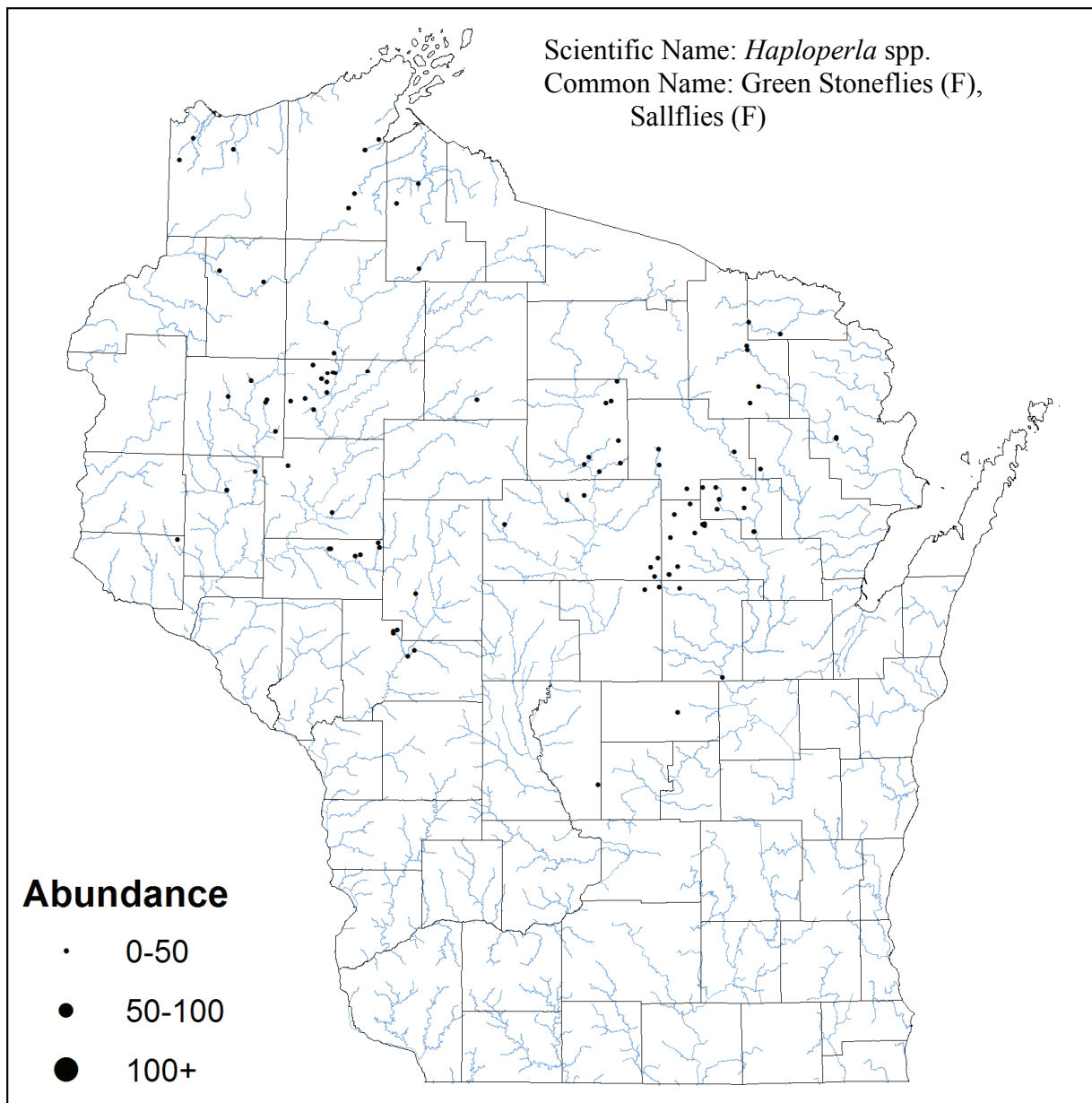




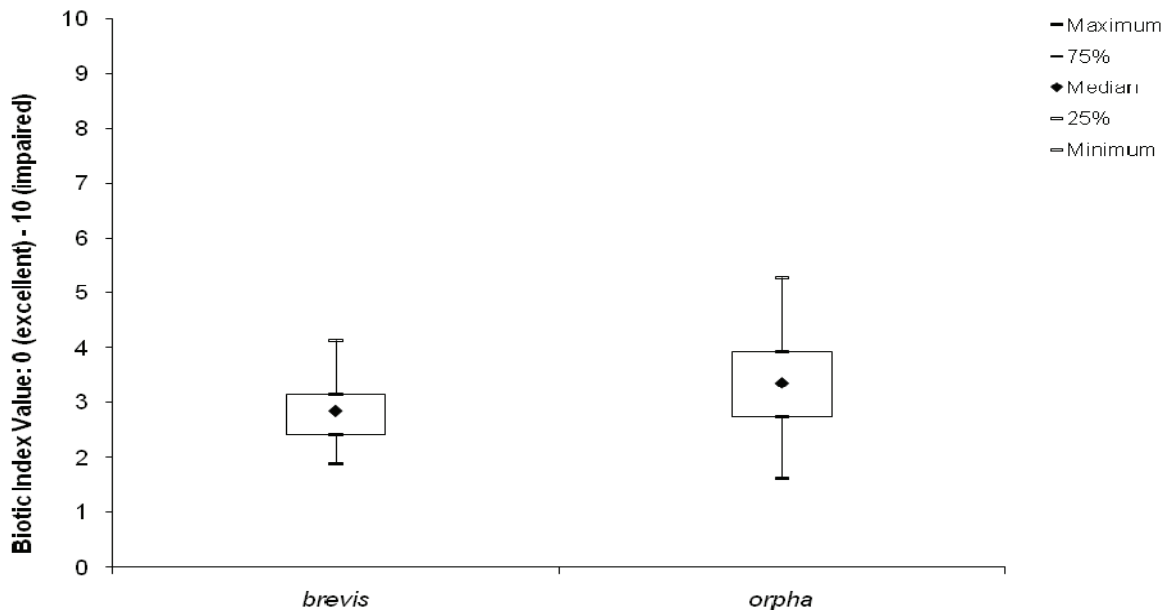
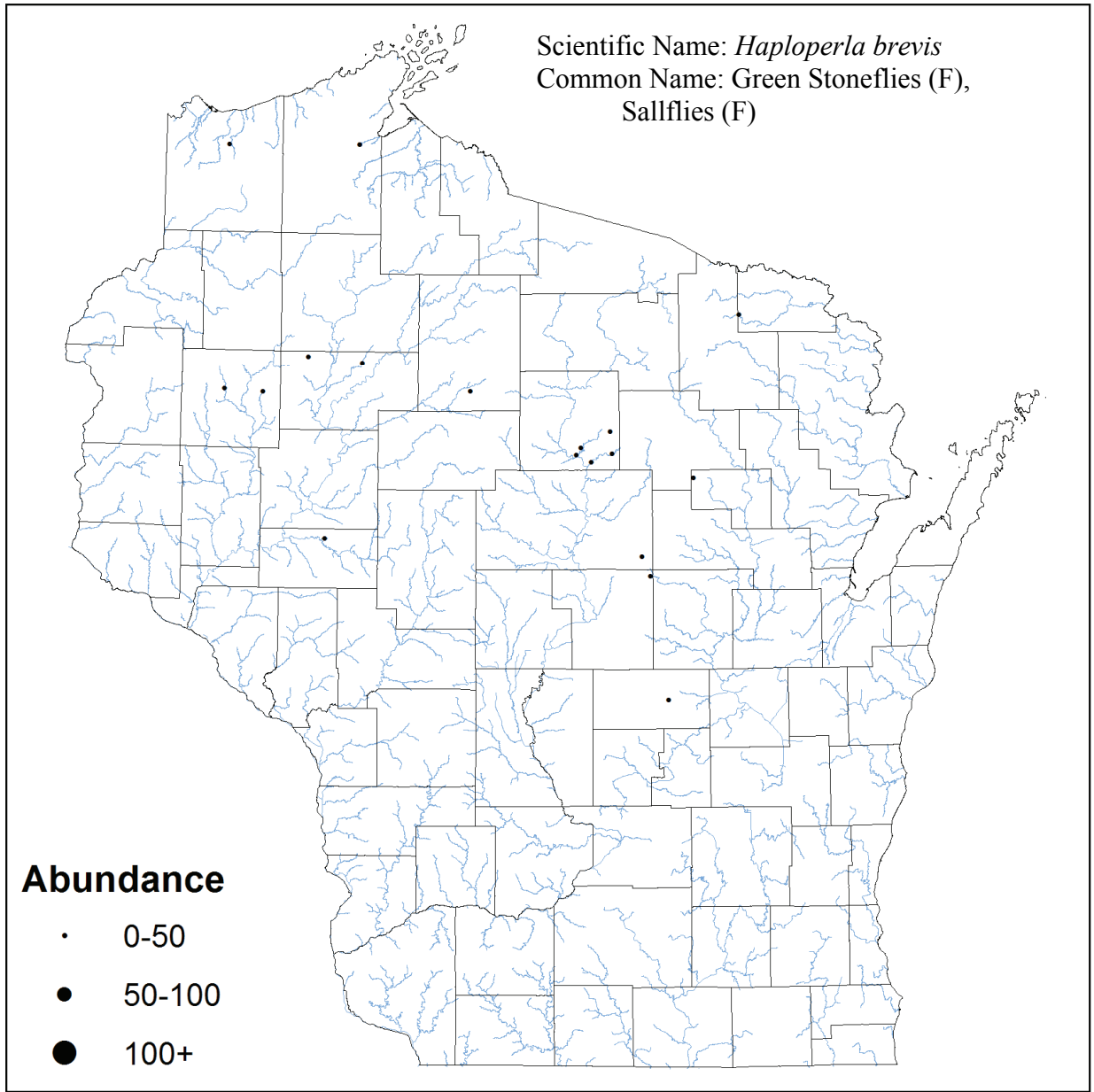
# Plecoptera Chloroperlidae



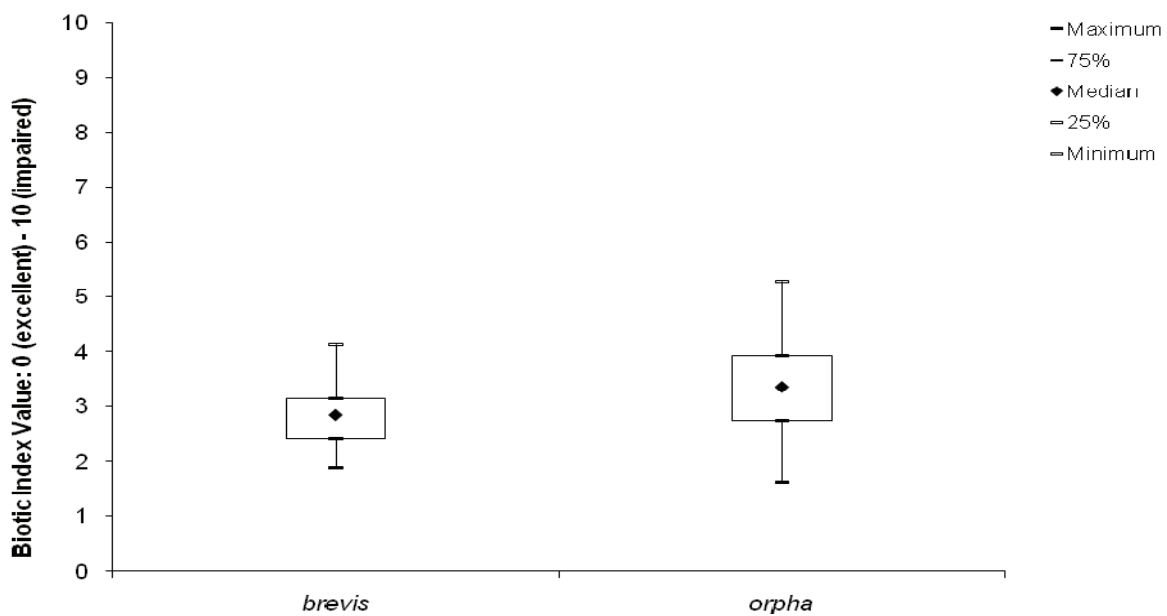
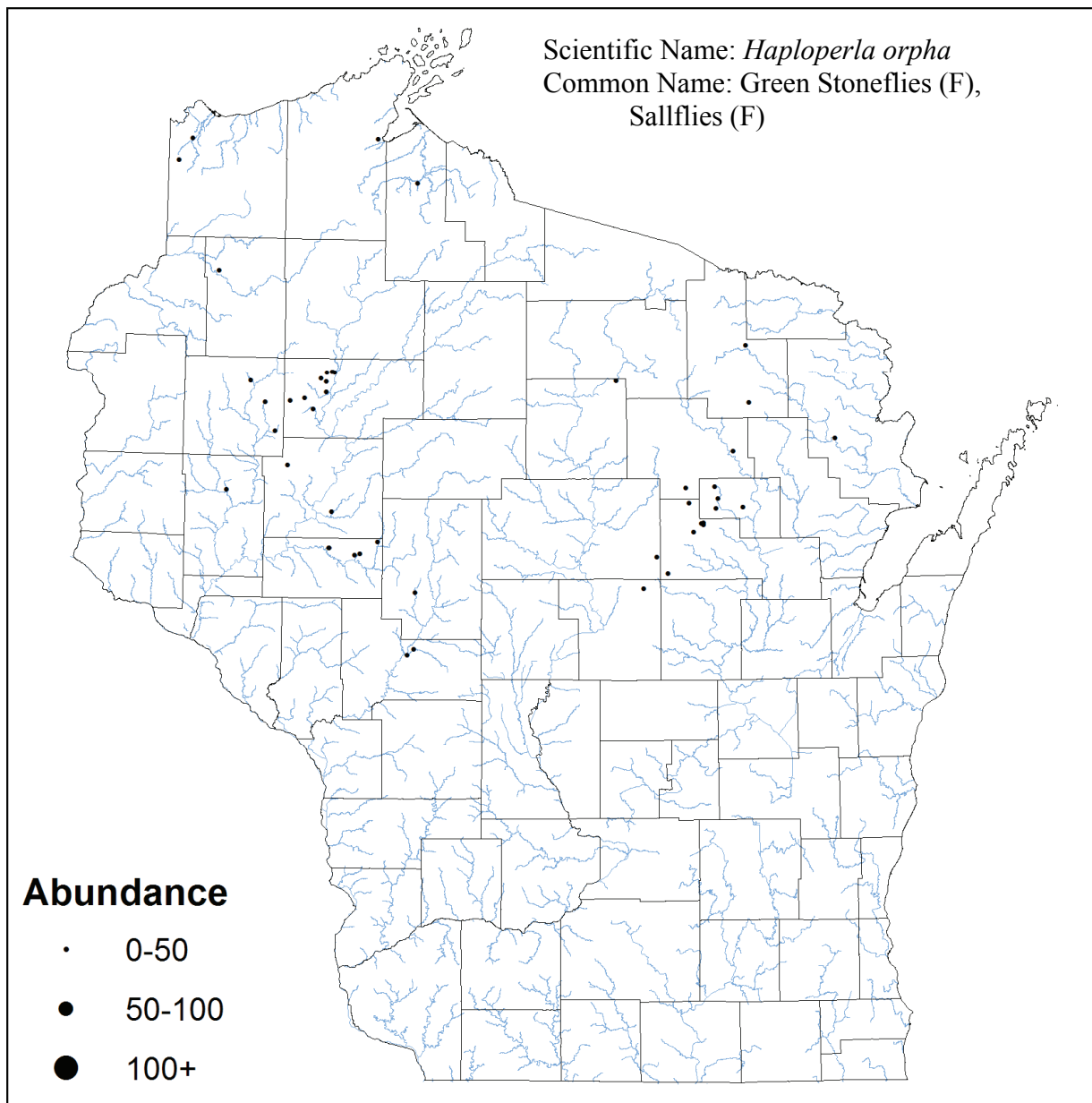
# Plecoptera Chloroperidae



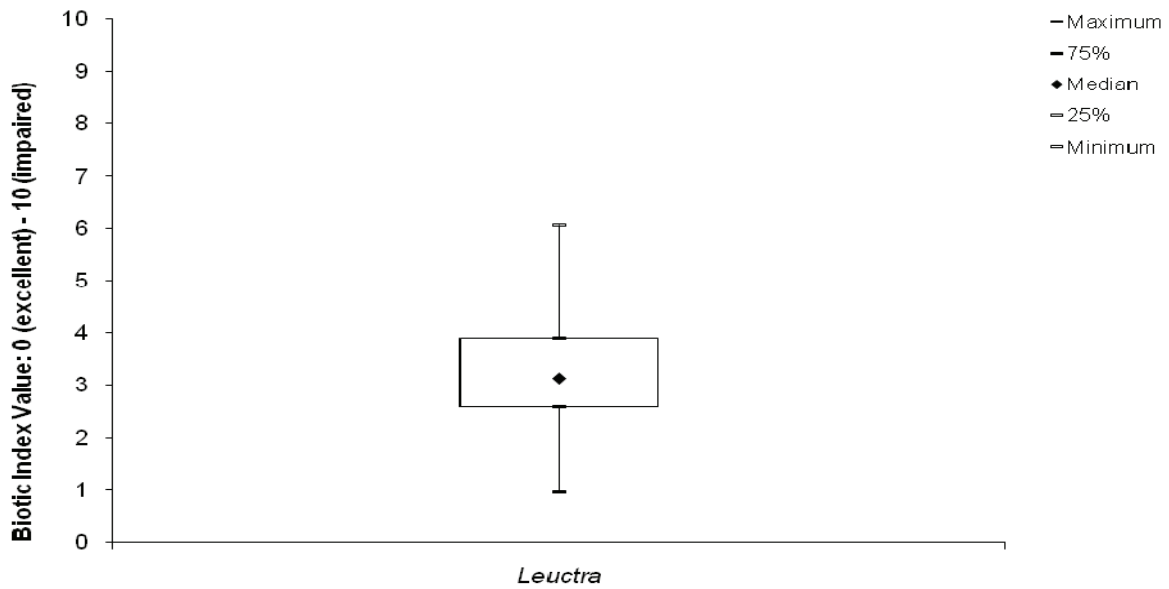
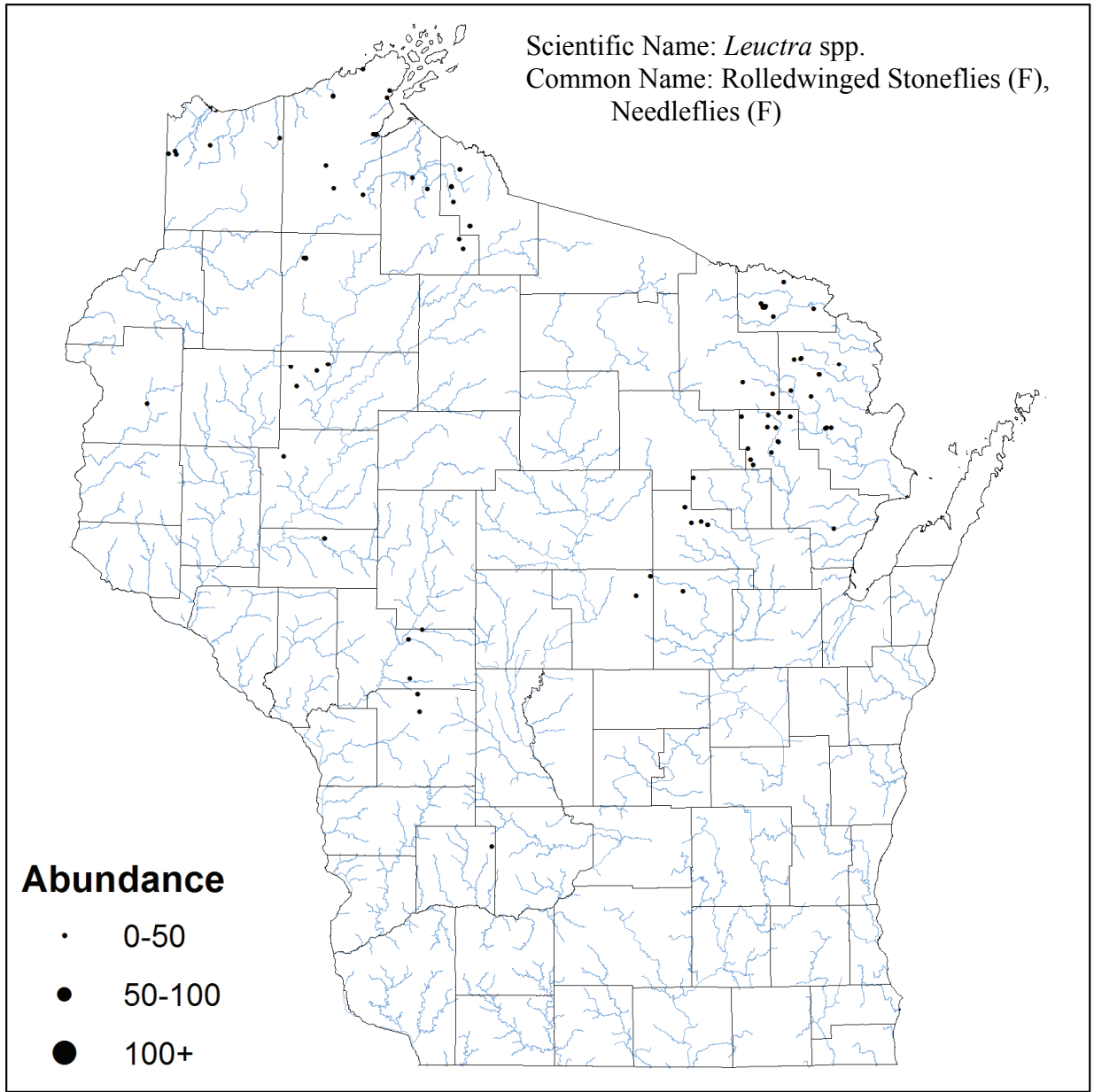
# Plecoptera Chloroperlidae



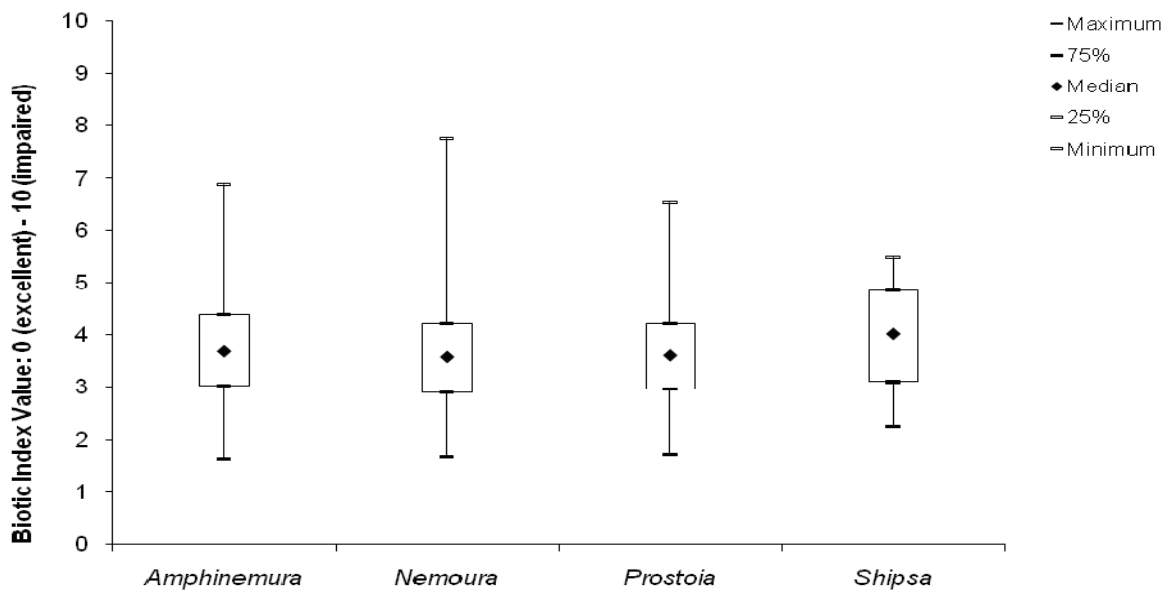
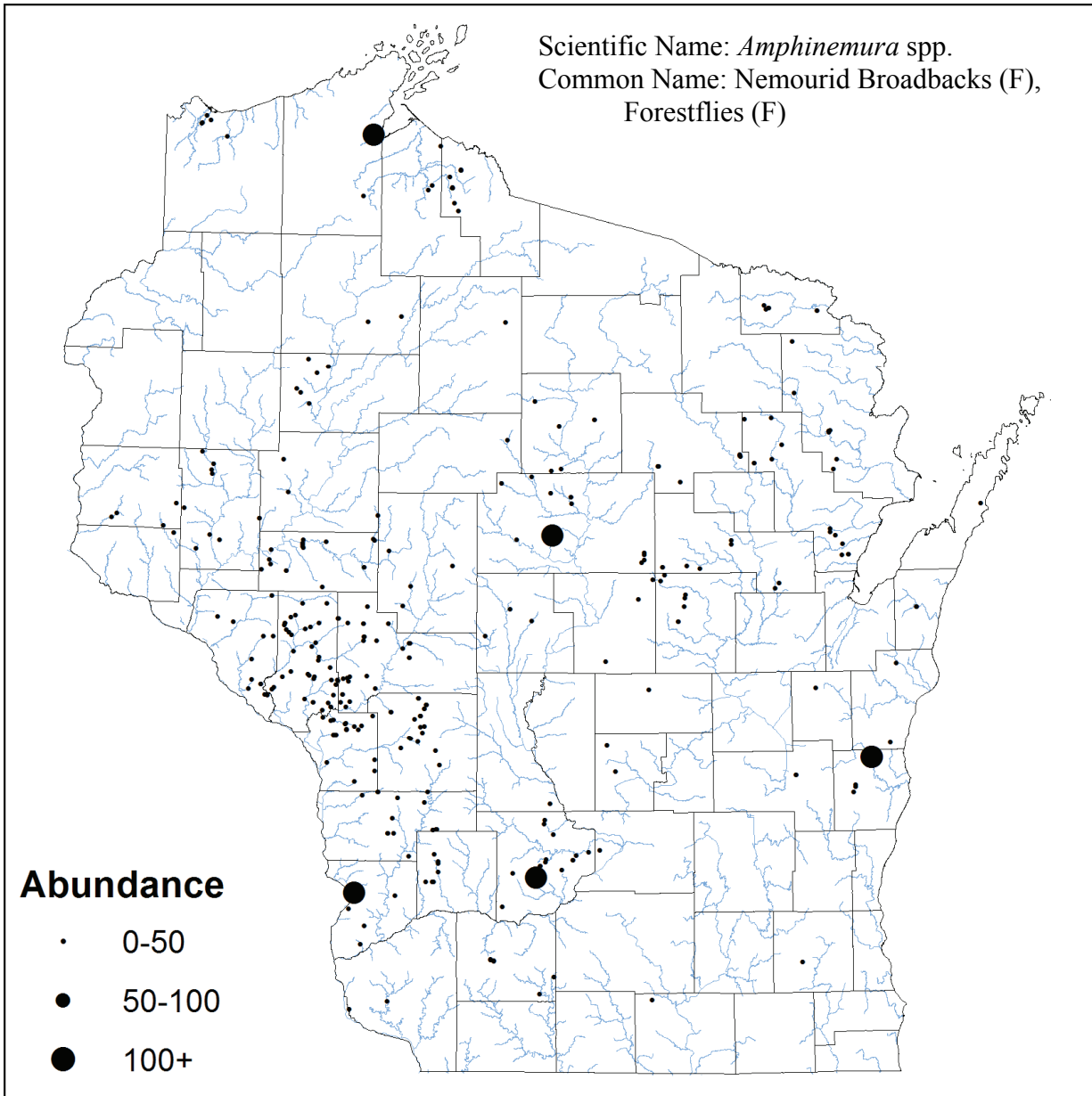
# Plecoptera Chloroperidae



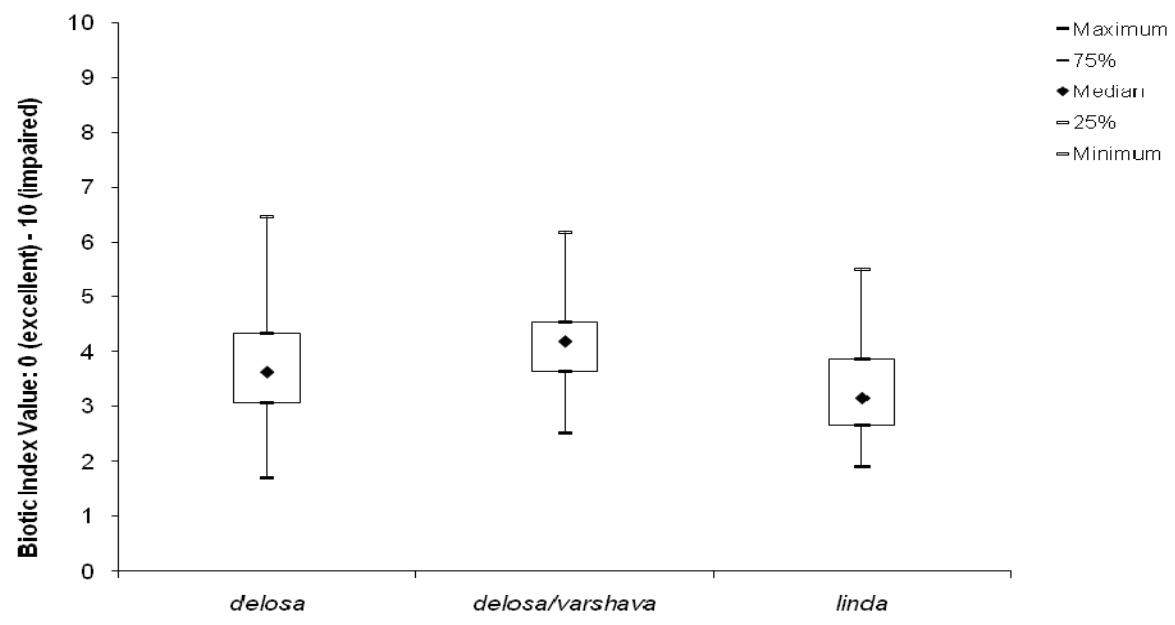
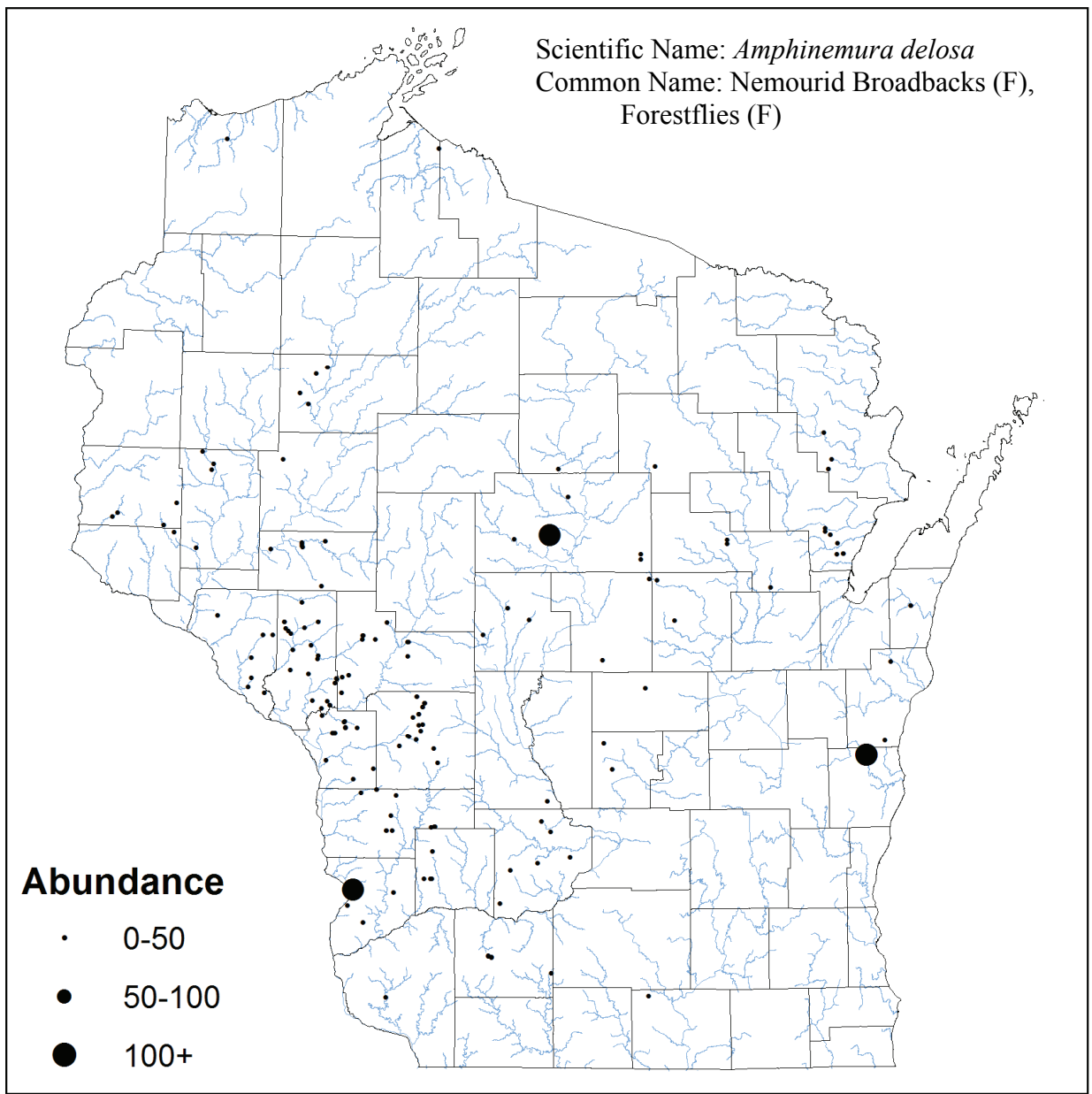
# Plecoptera Leuctridae



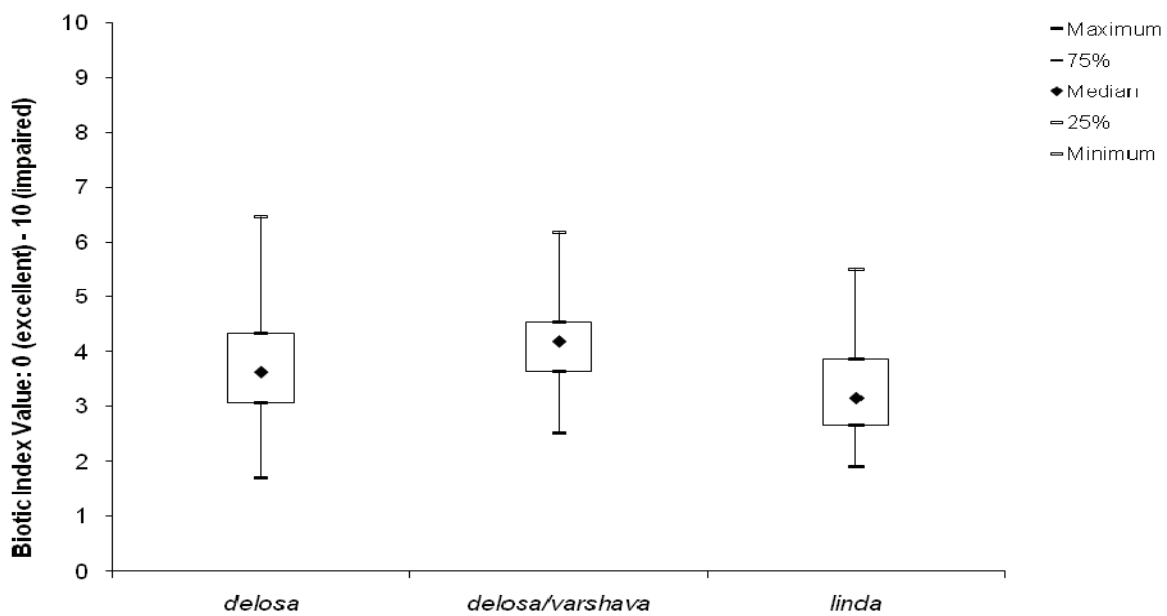
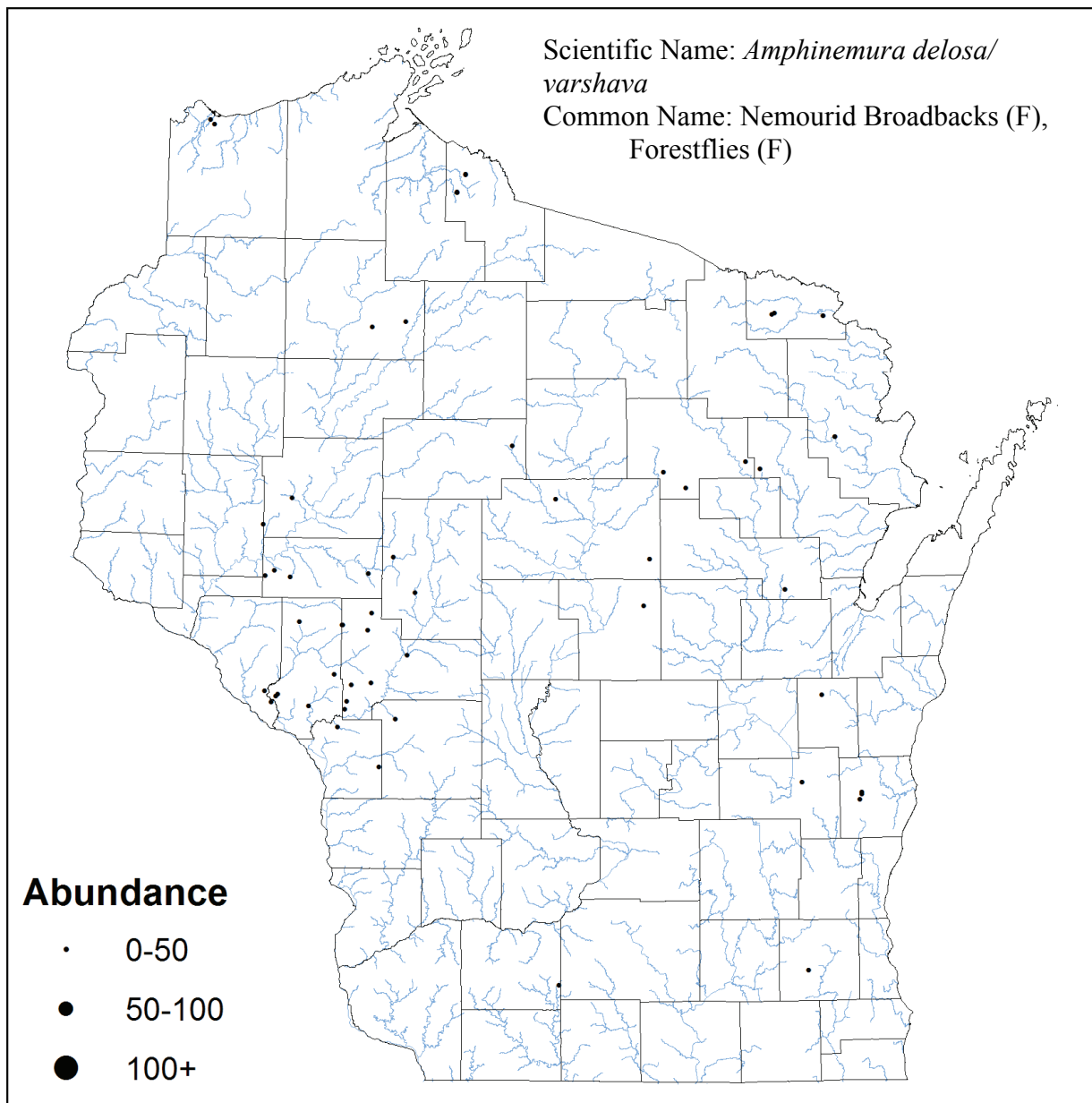
# Plecoptera Nemouridae



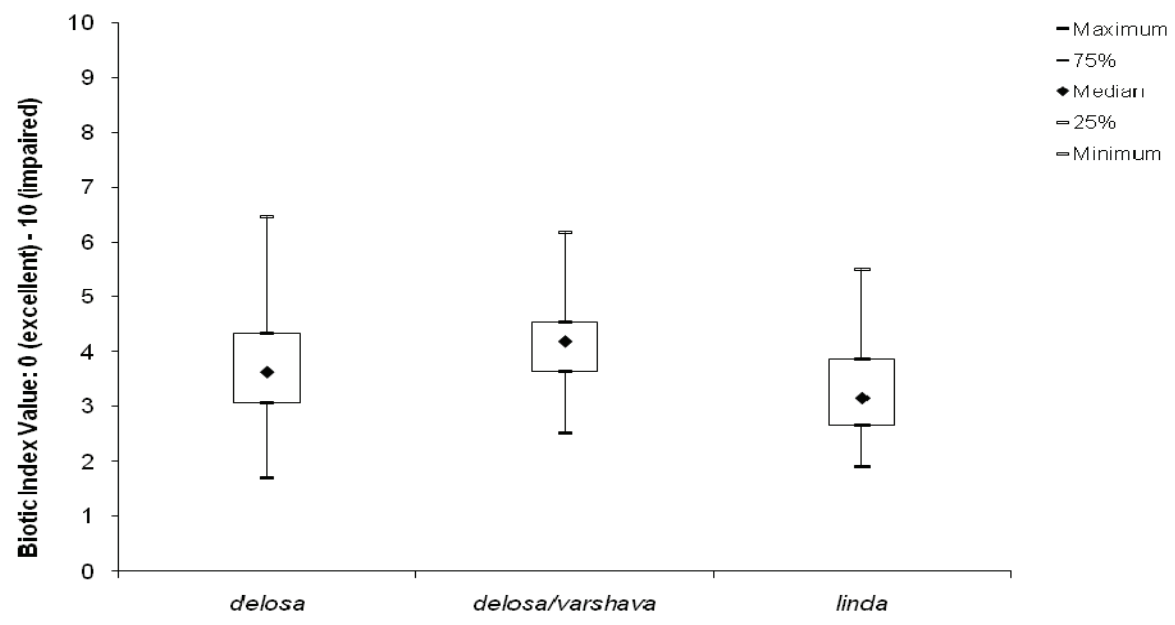
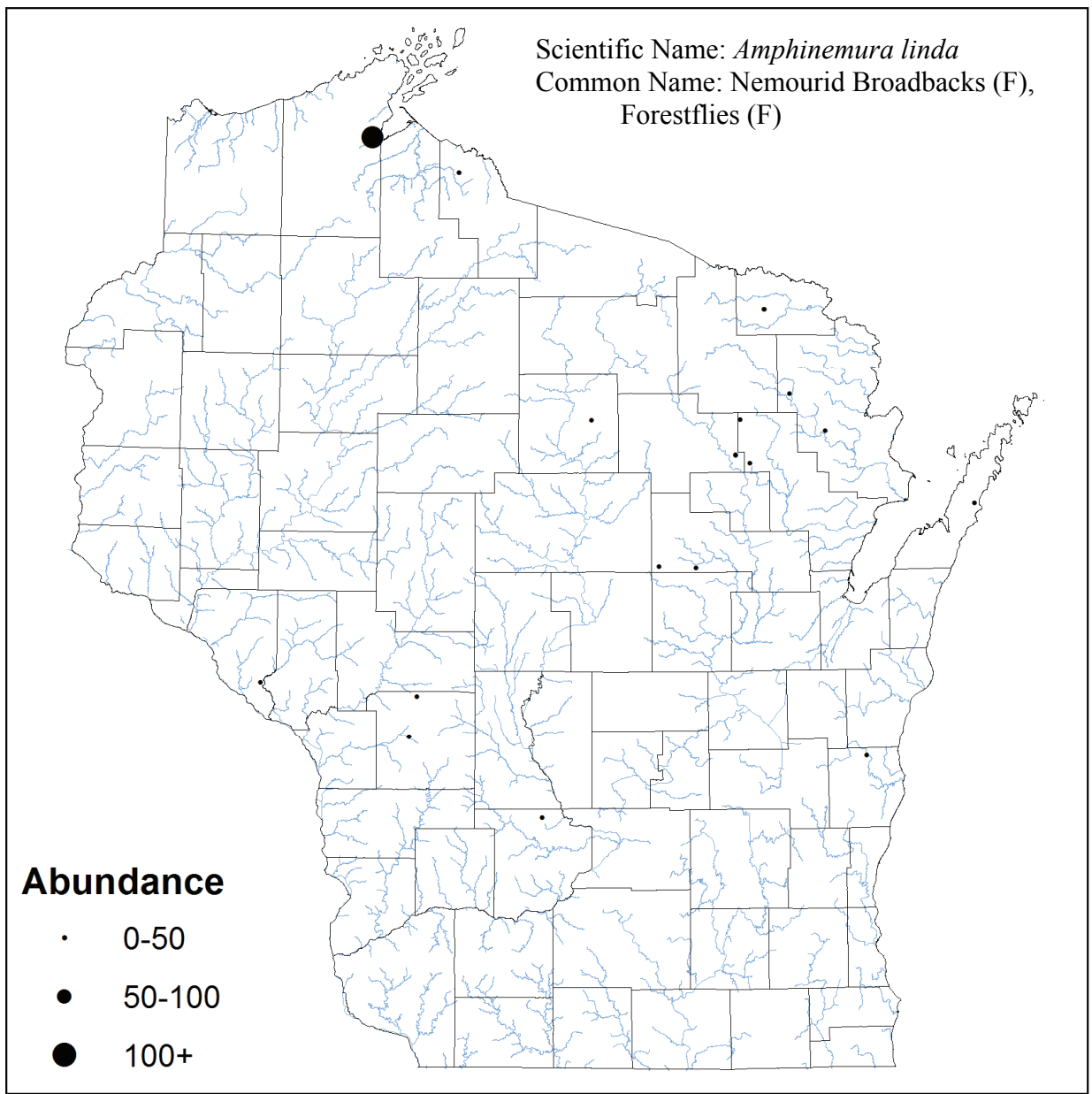
# Plecoptera Nemouridae

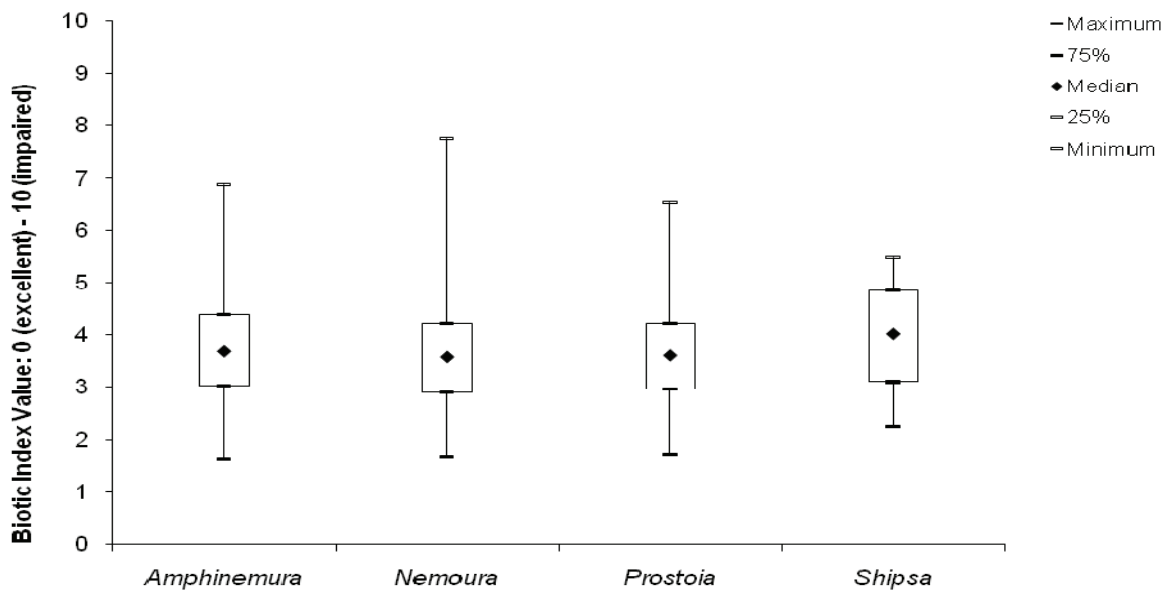
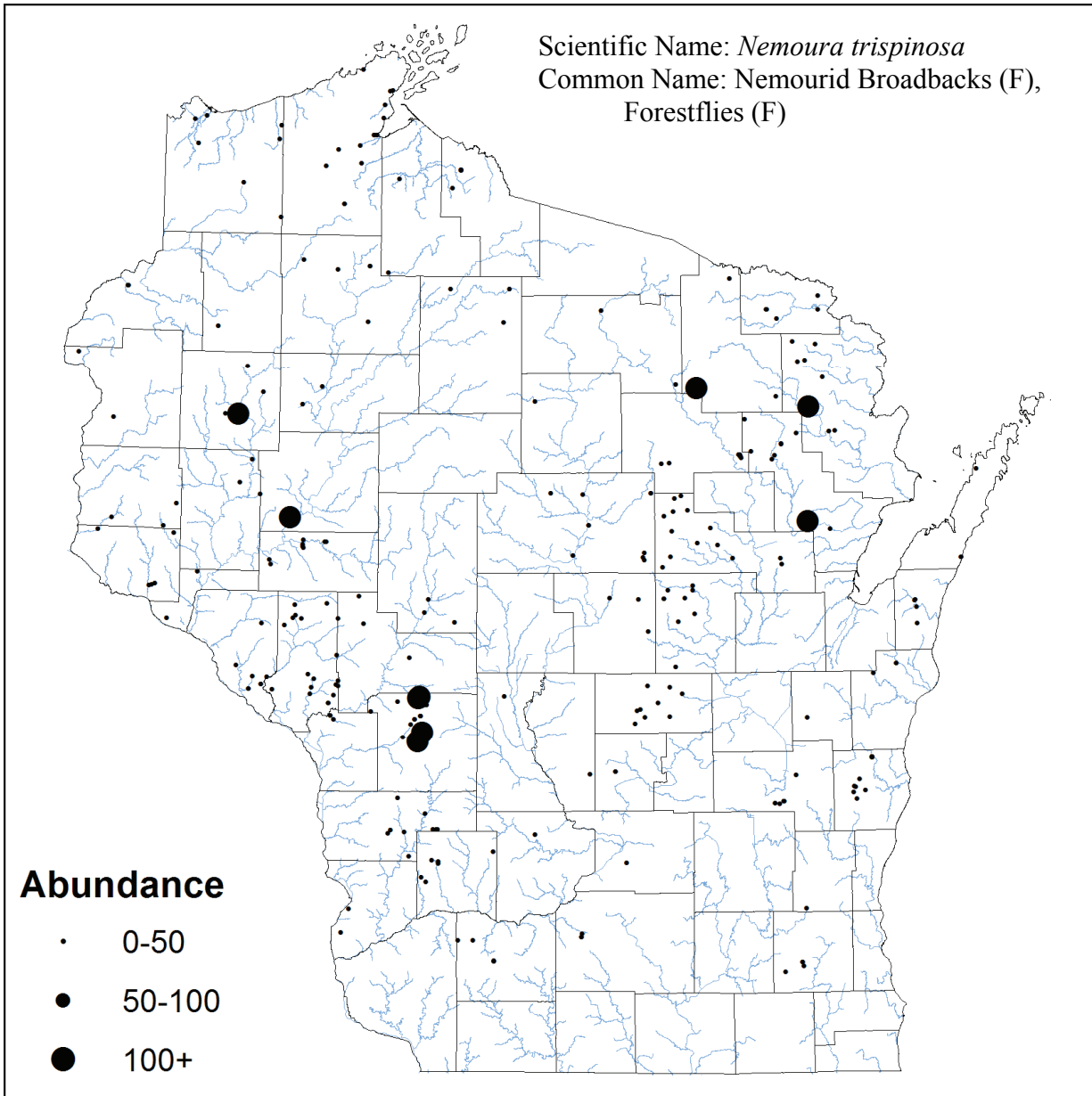




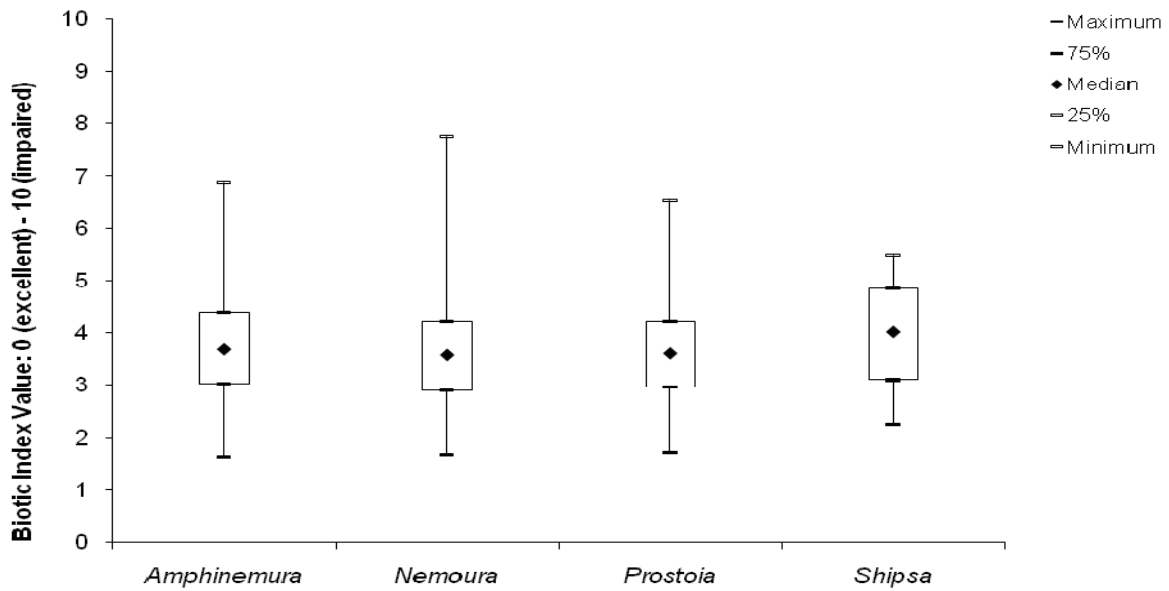
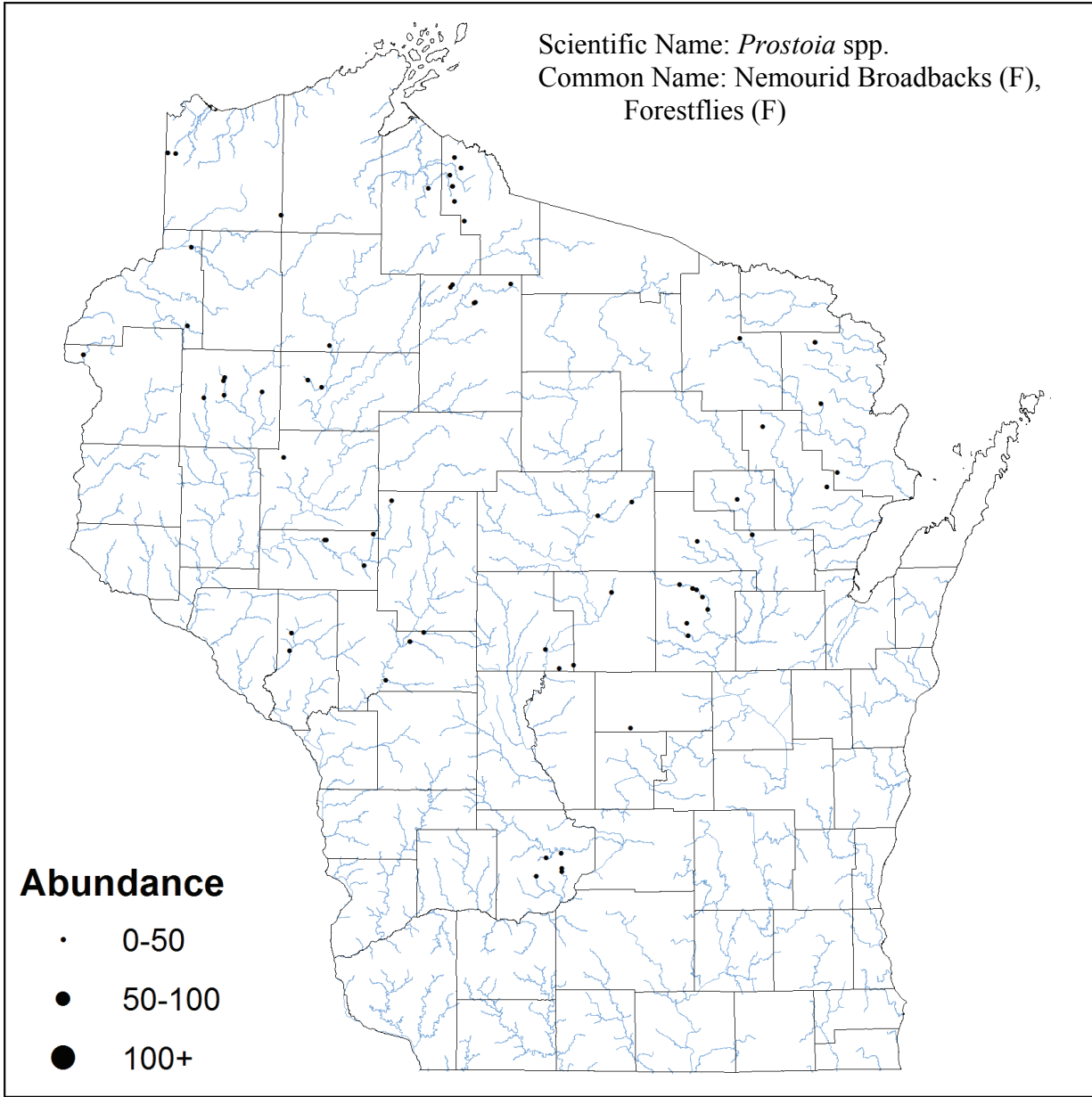


# Plecoptera Nemouridae

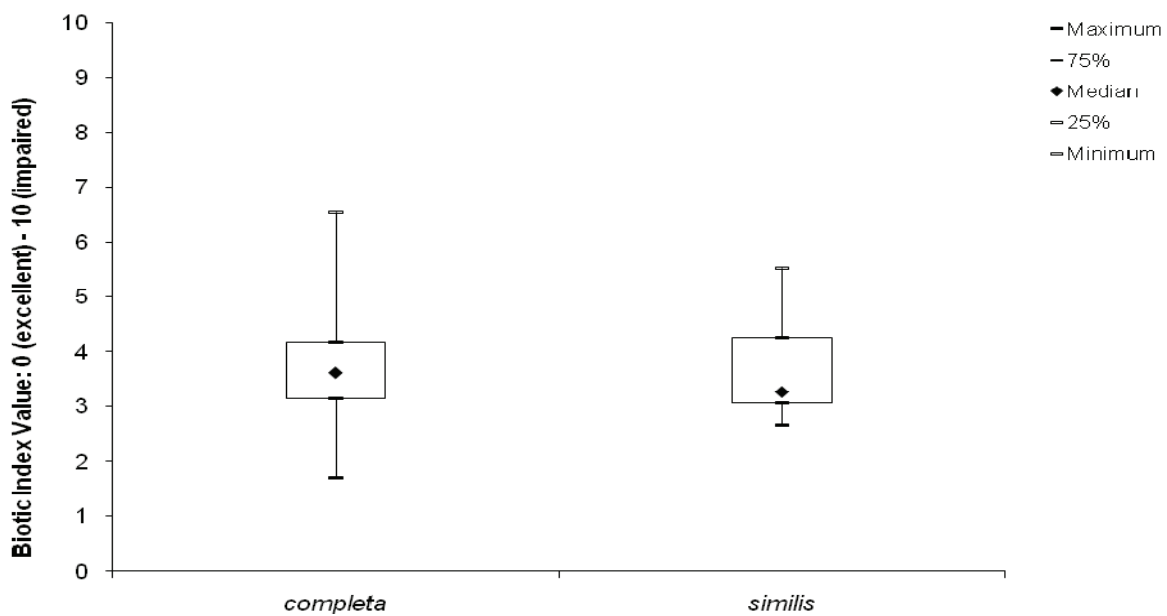
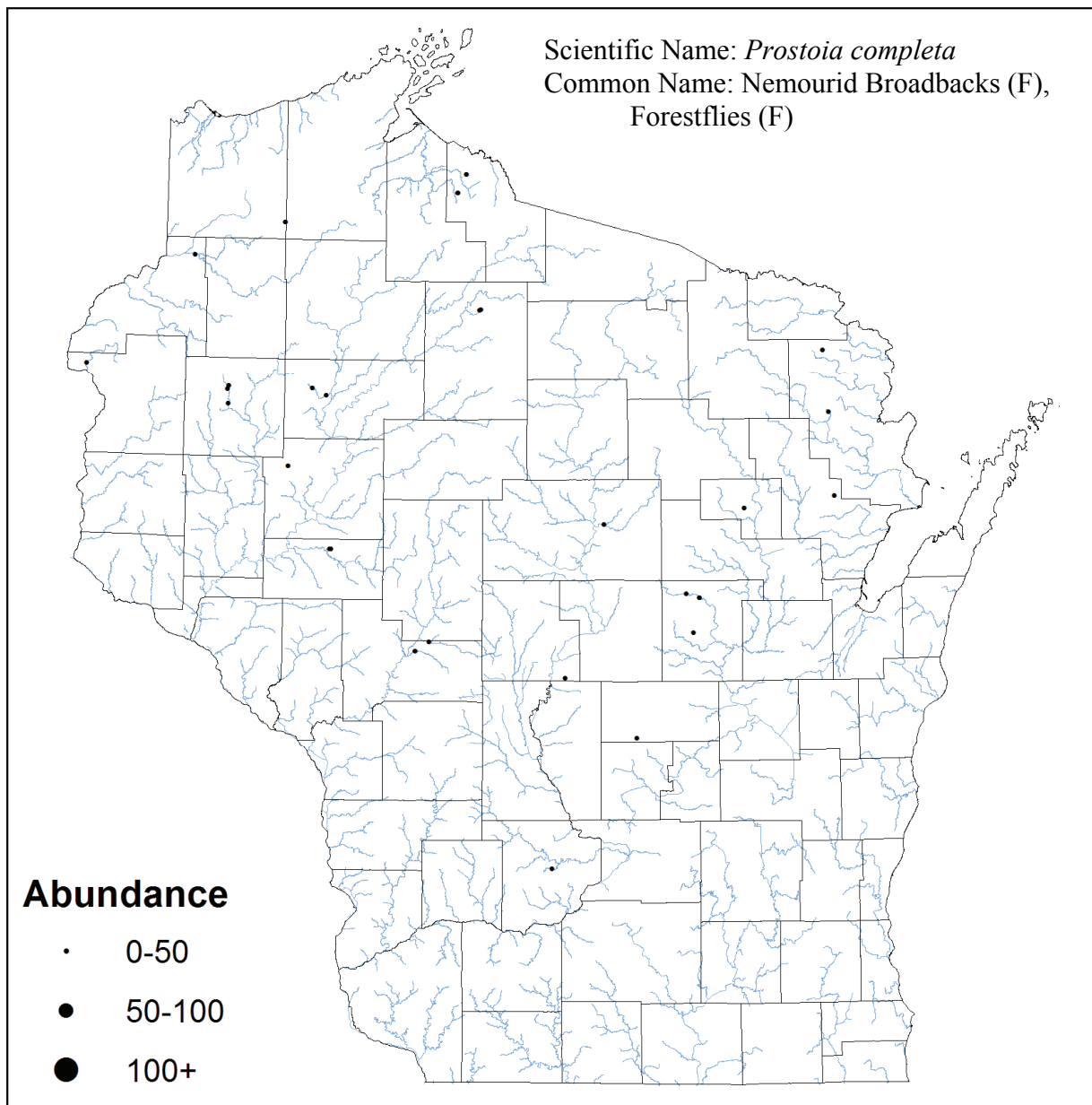




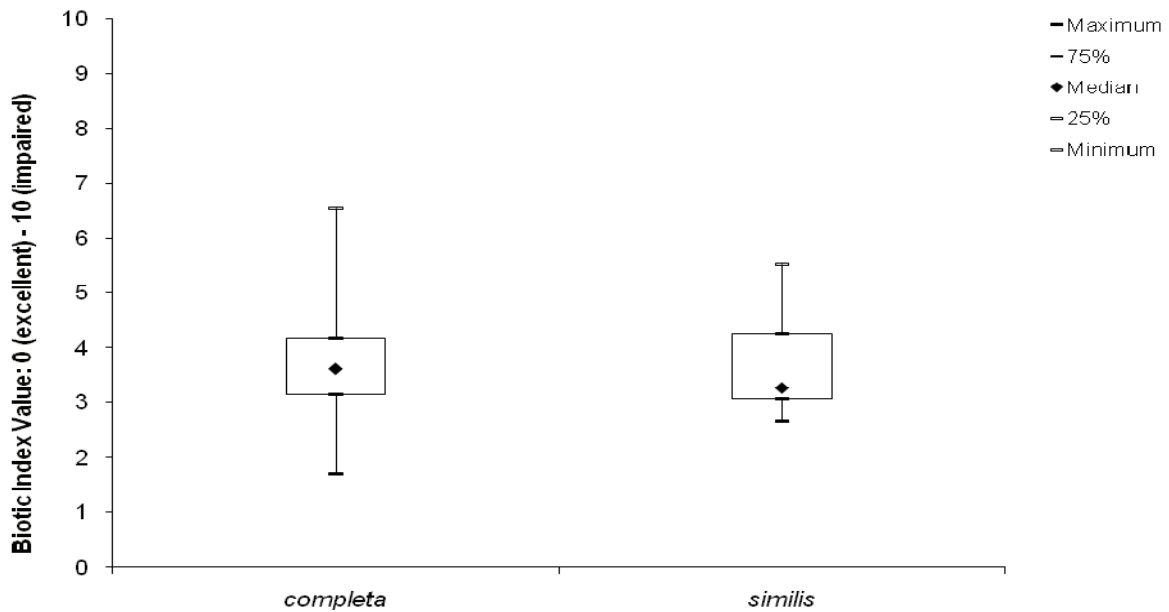
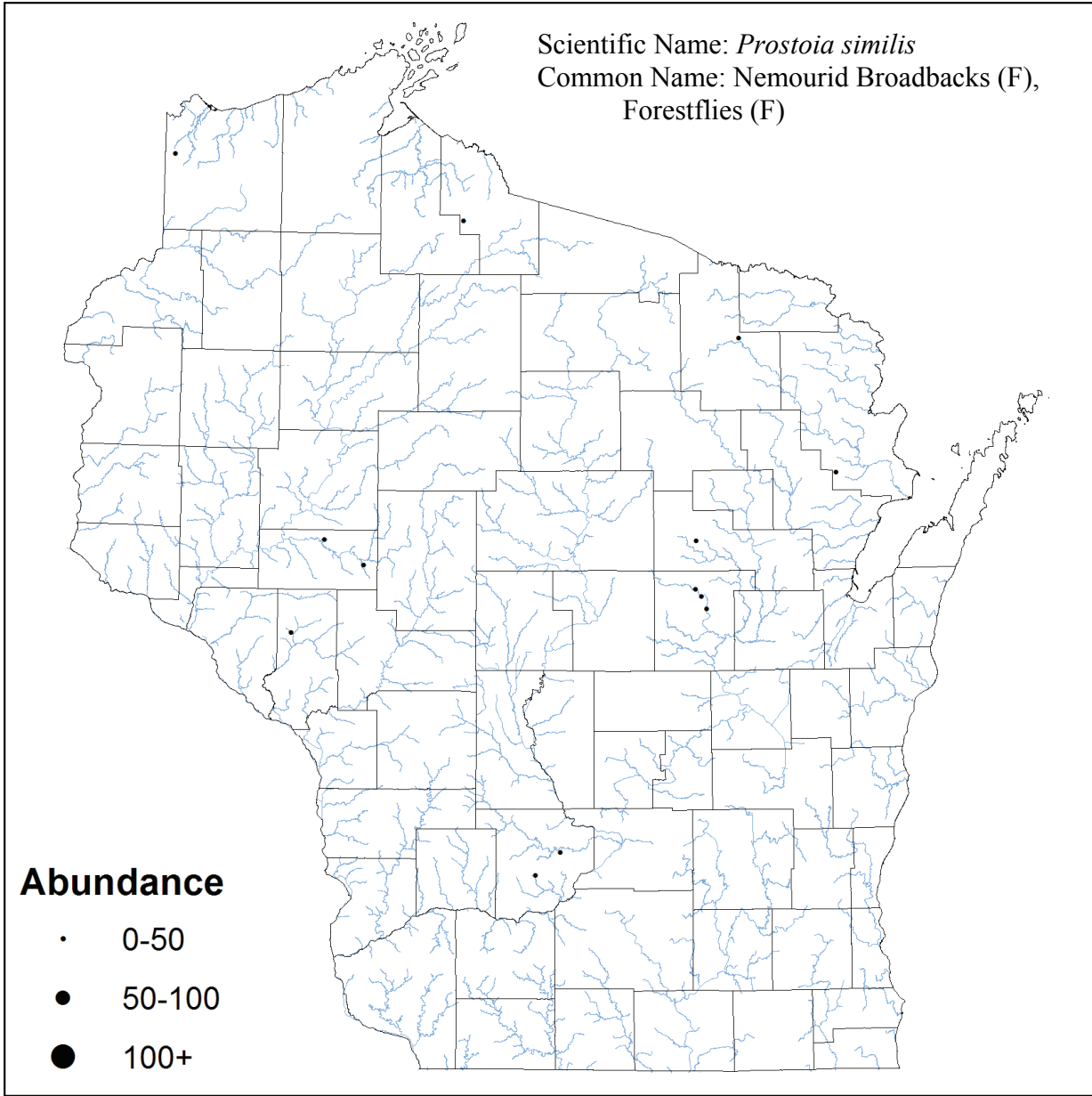
# Plecoptera Nemouridae

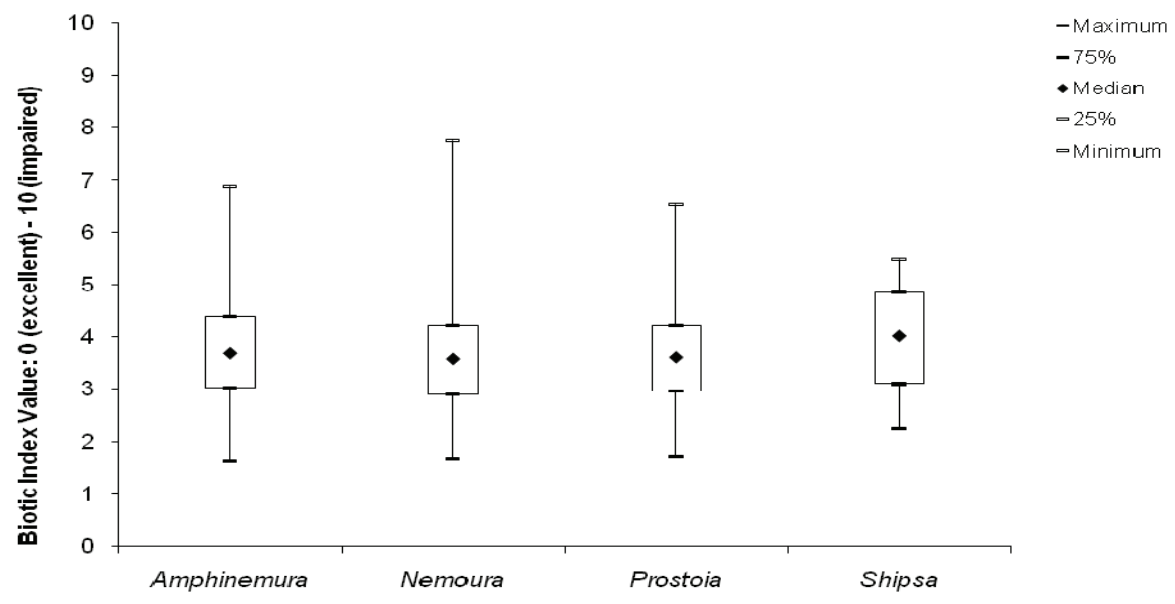
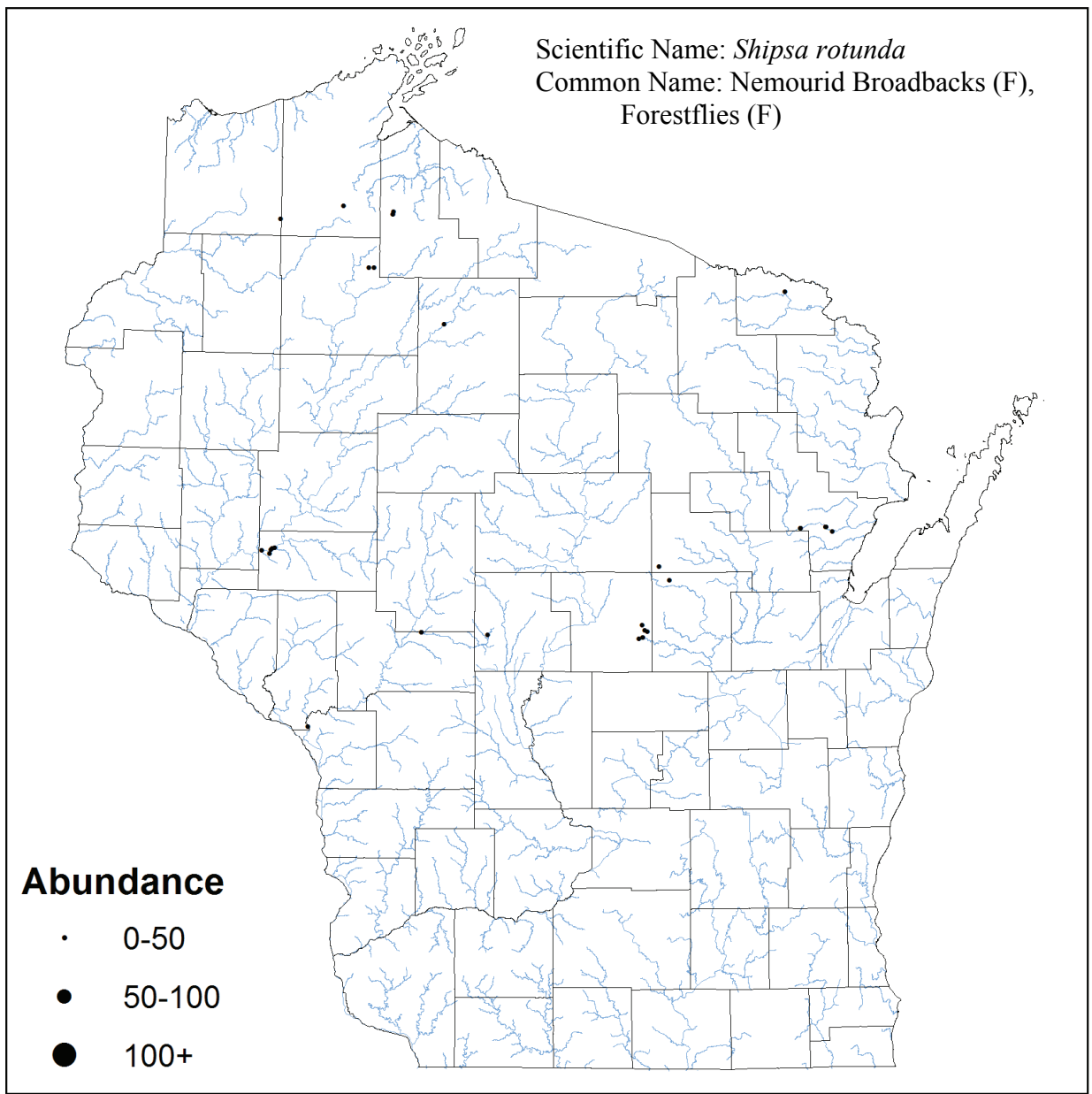


# Plecoptera Nemouridae

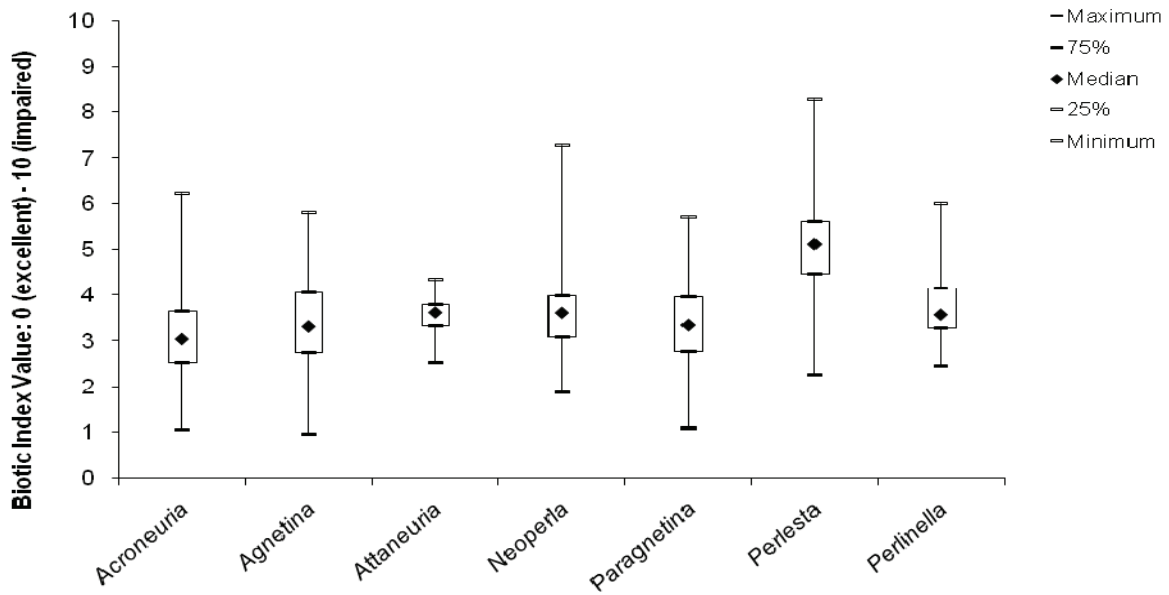
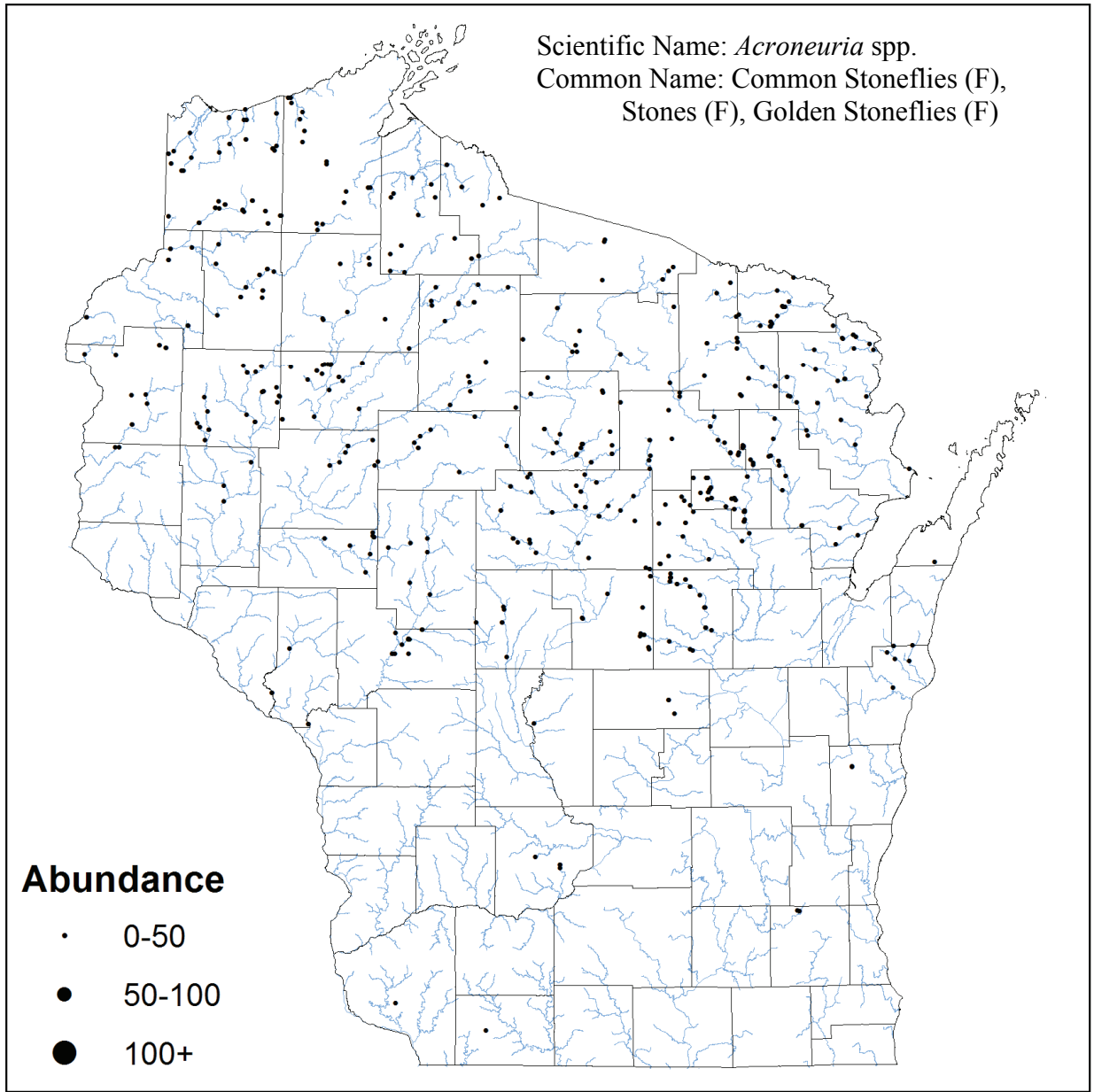


# Plecoptera Nemouridae



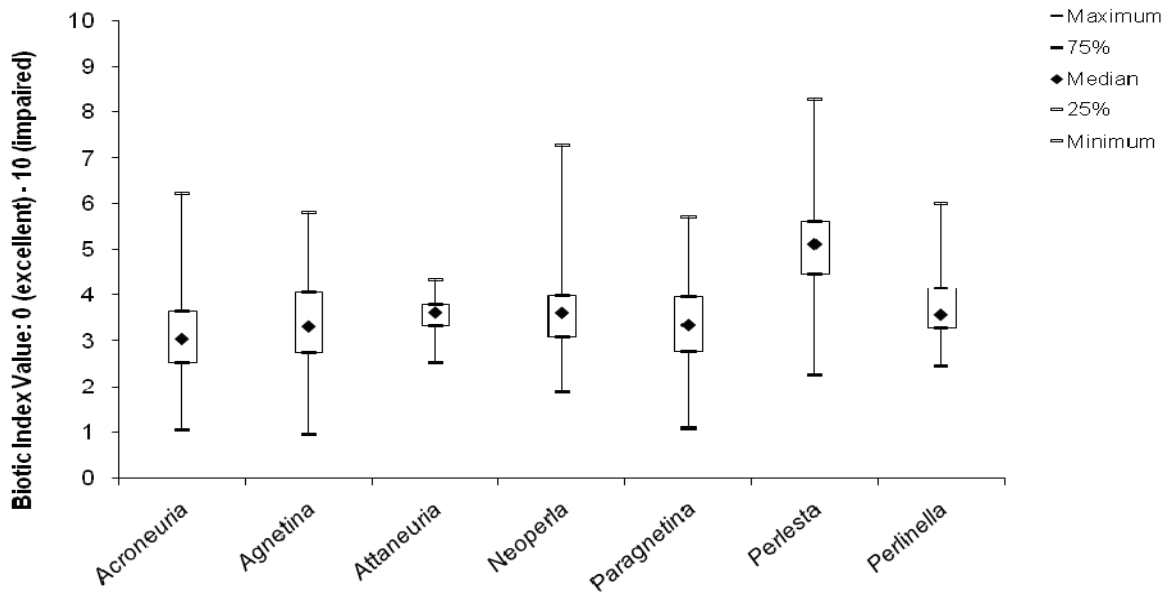
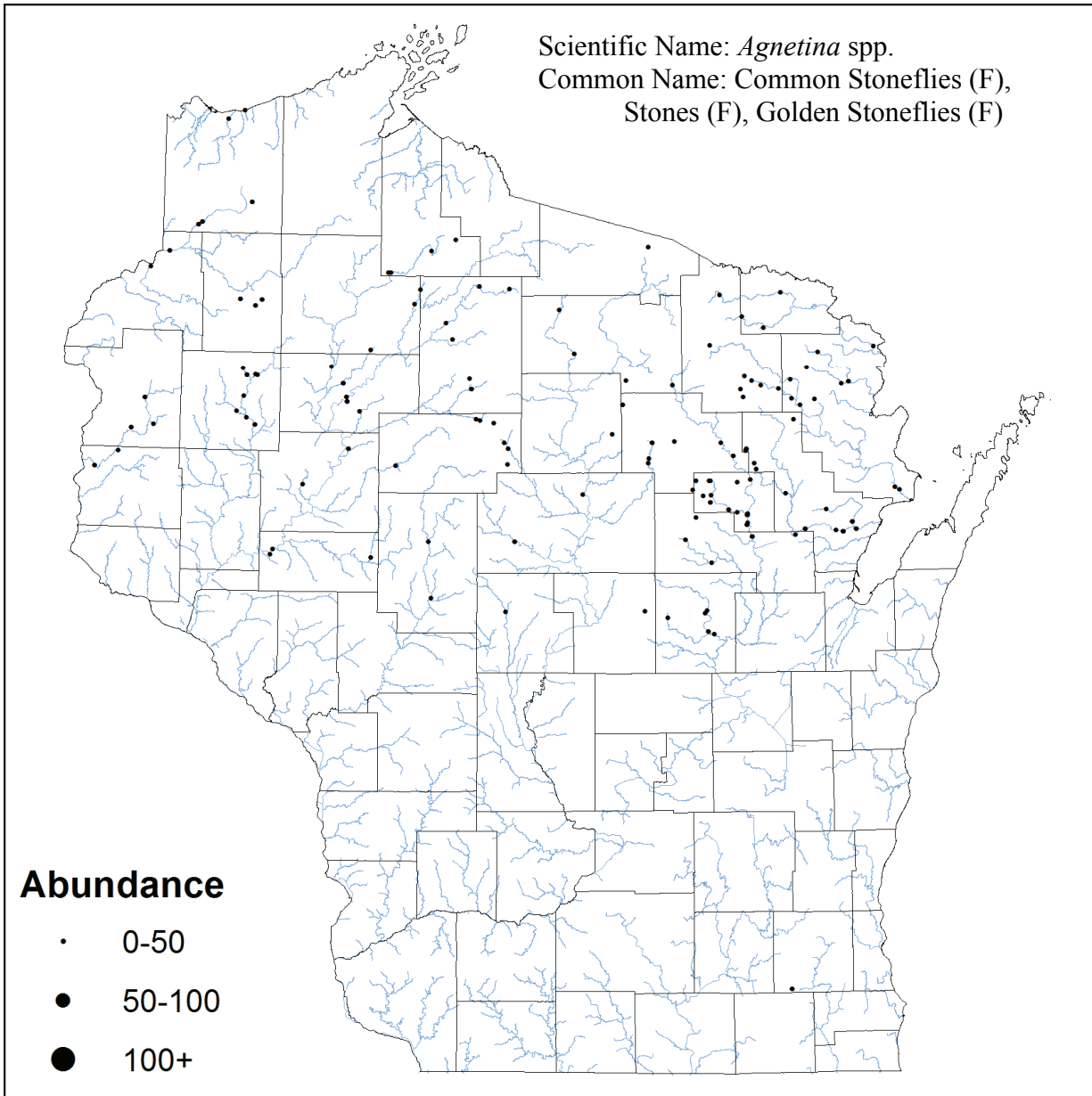


# Plecoptera Perlidae

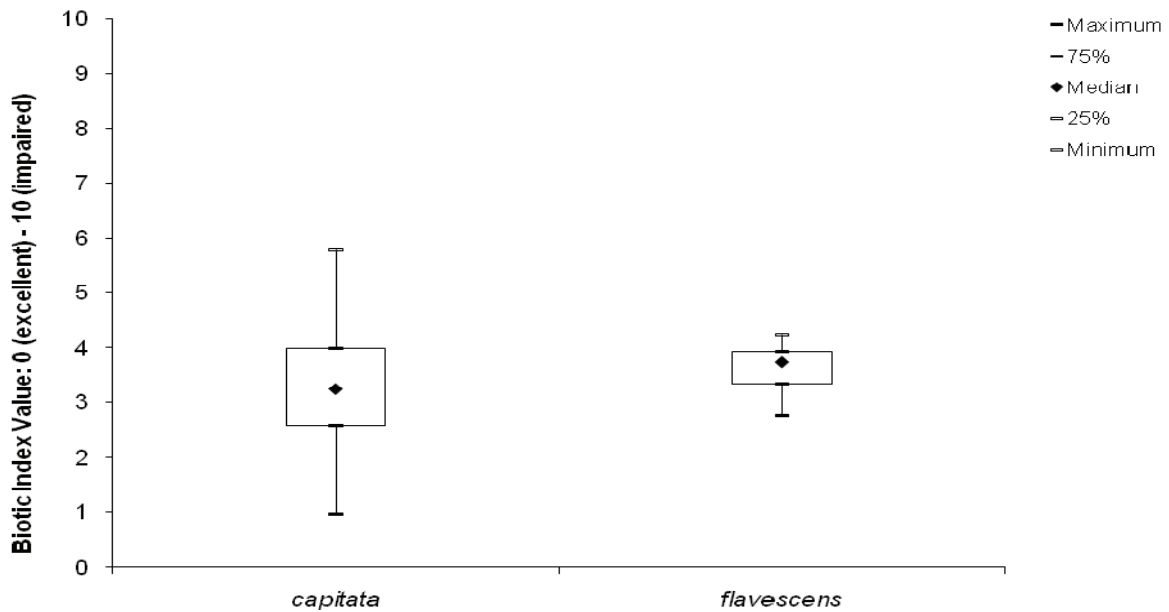
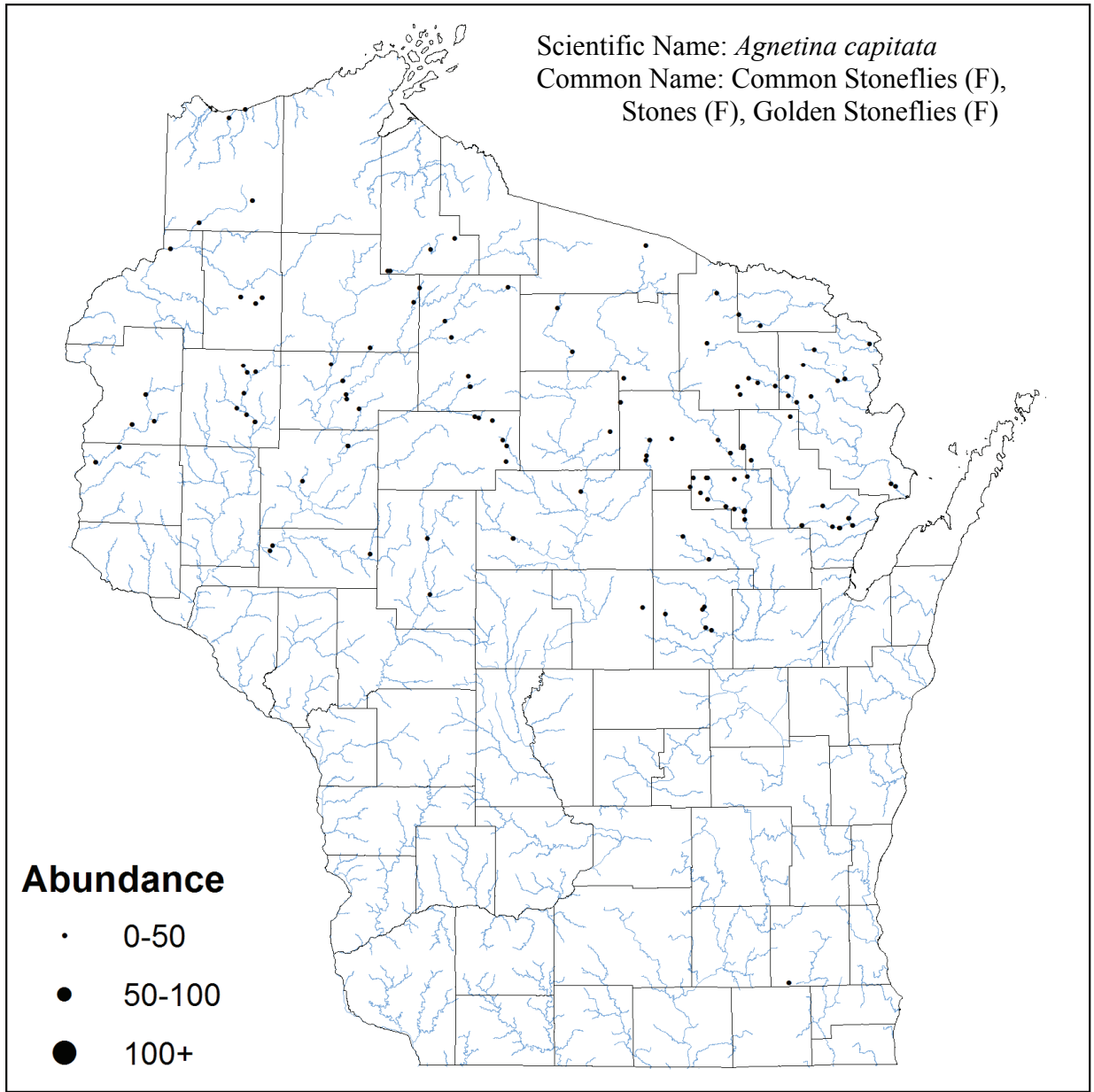




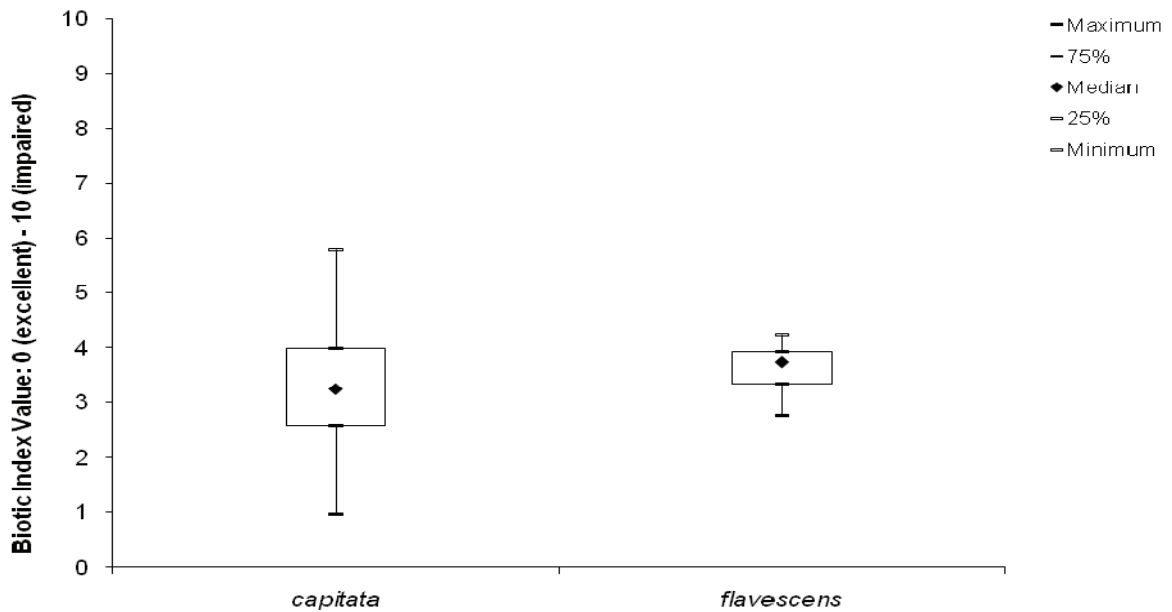
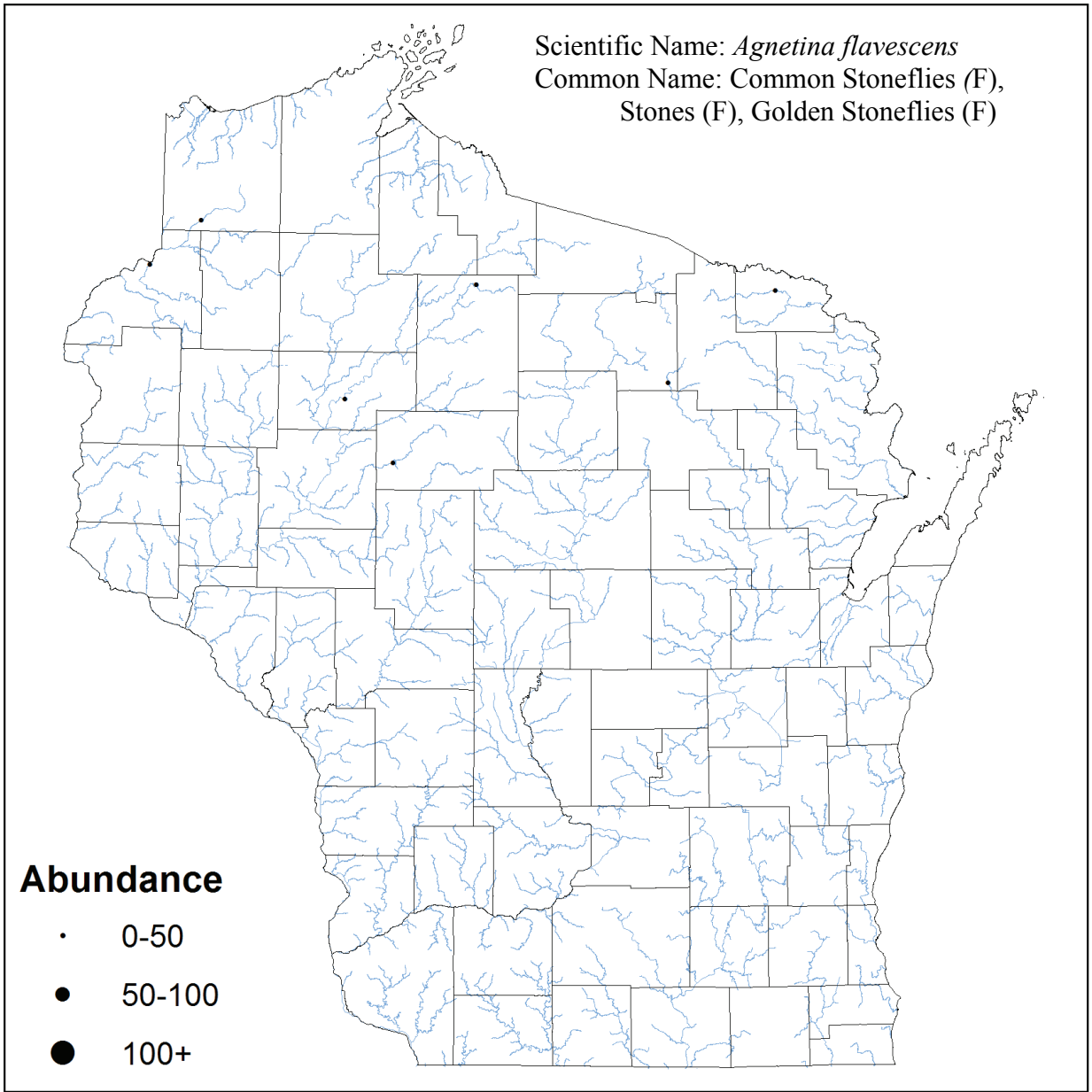
# Plecoptera Perlidae



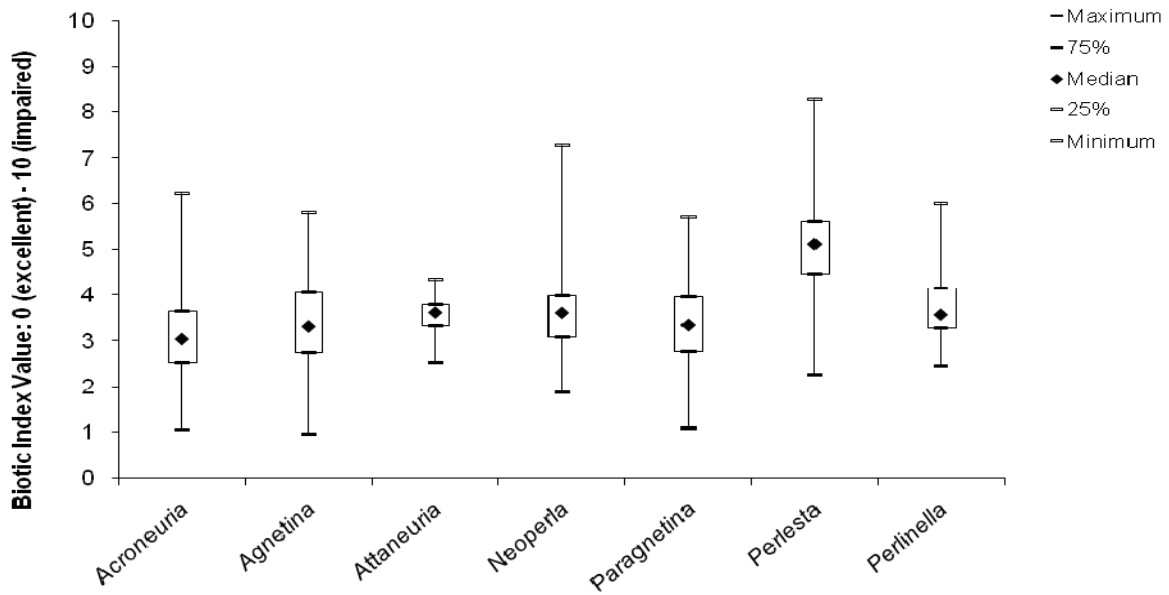
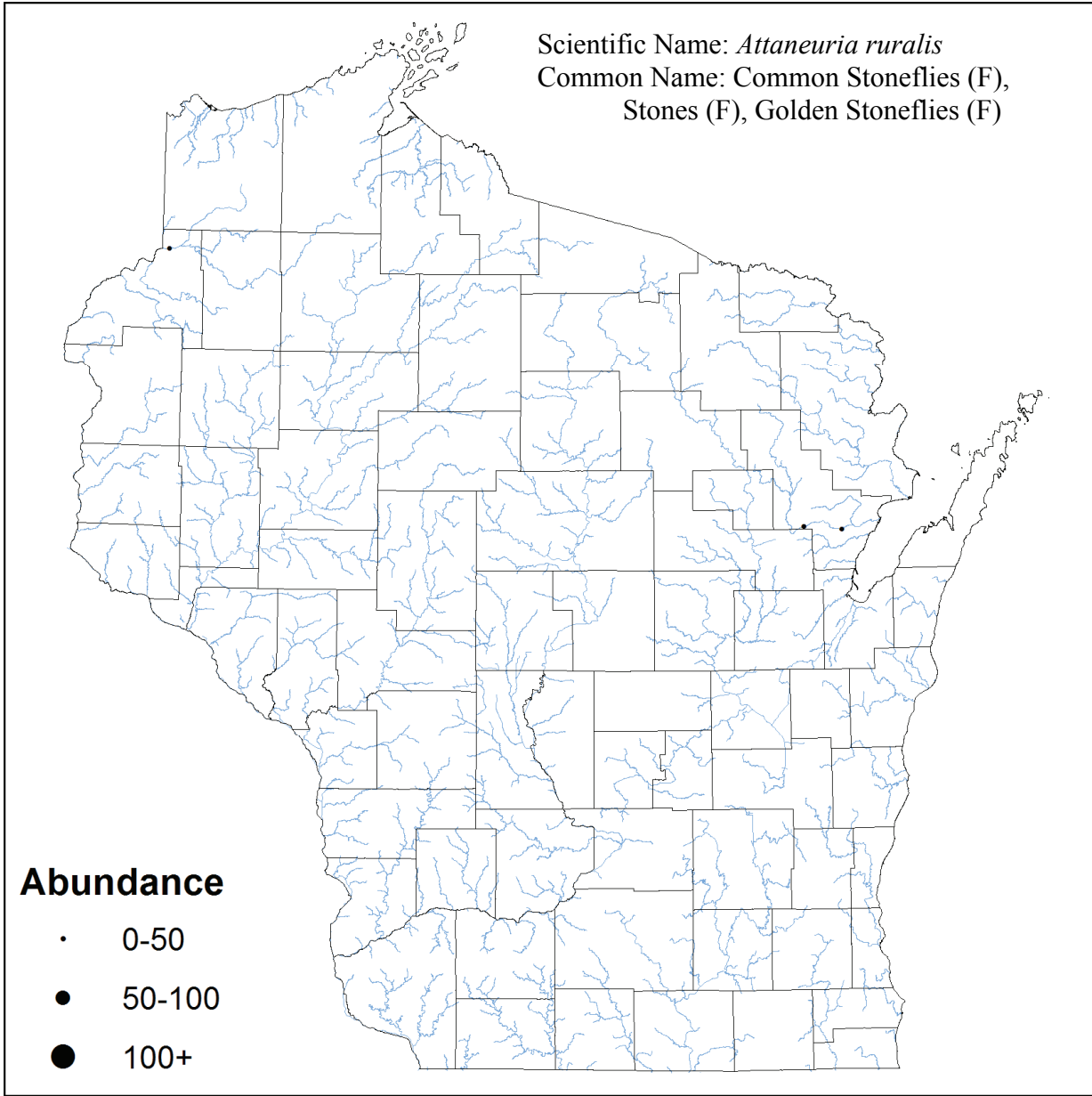
# Plecoptera Perlidae



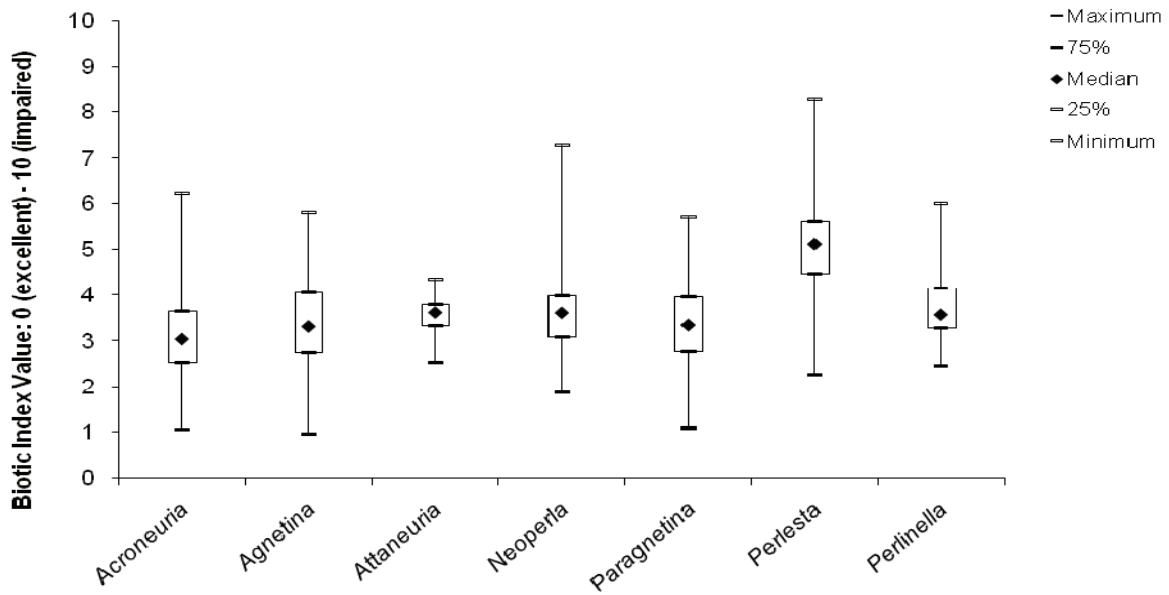
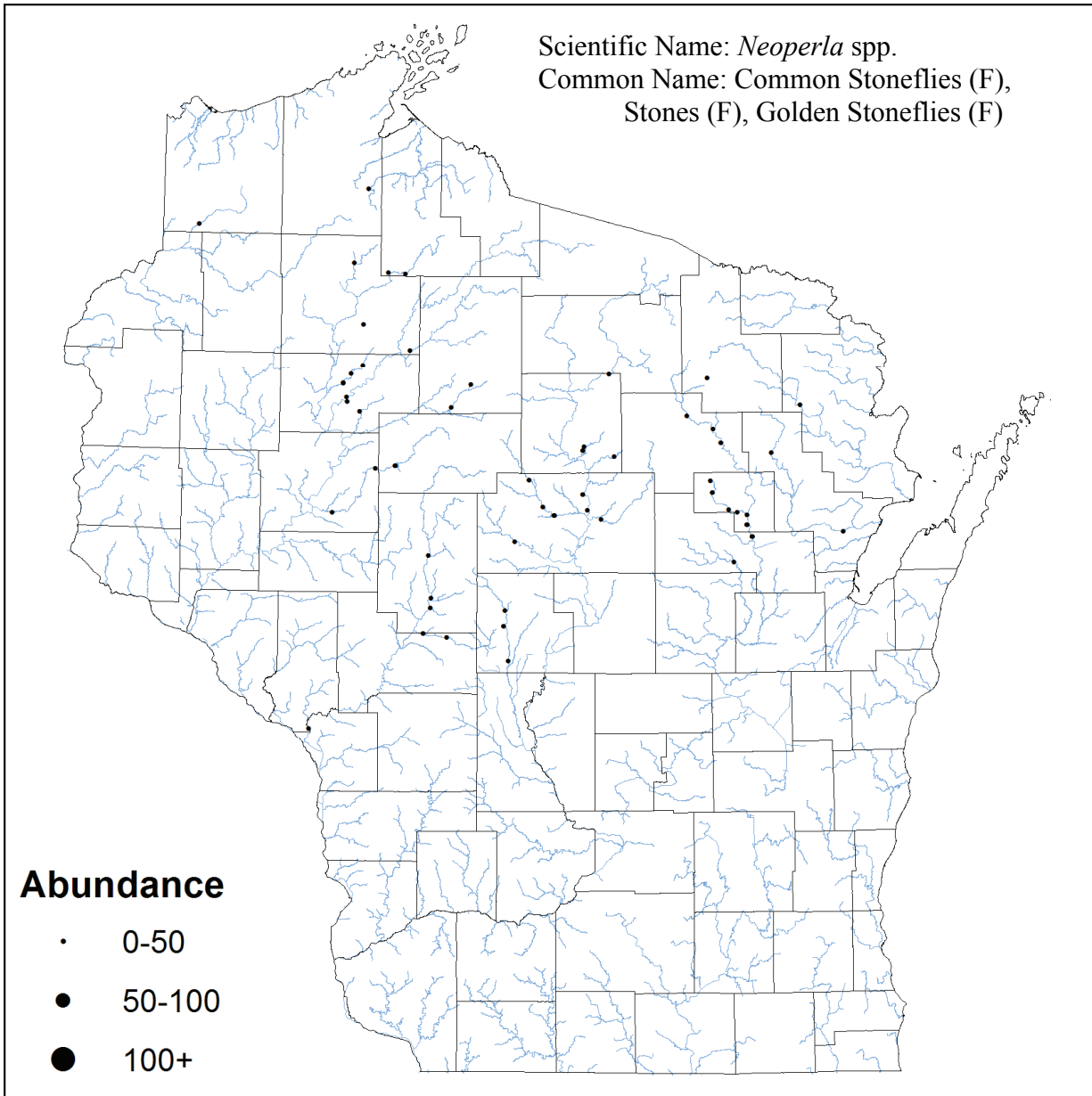
# Plecoptera Perlidae



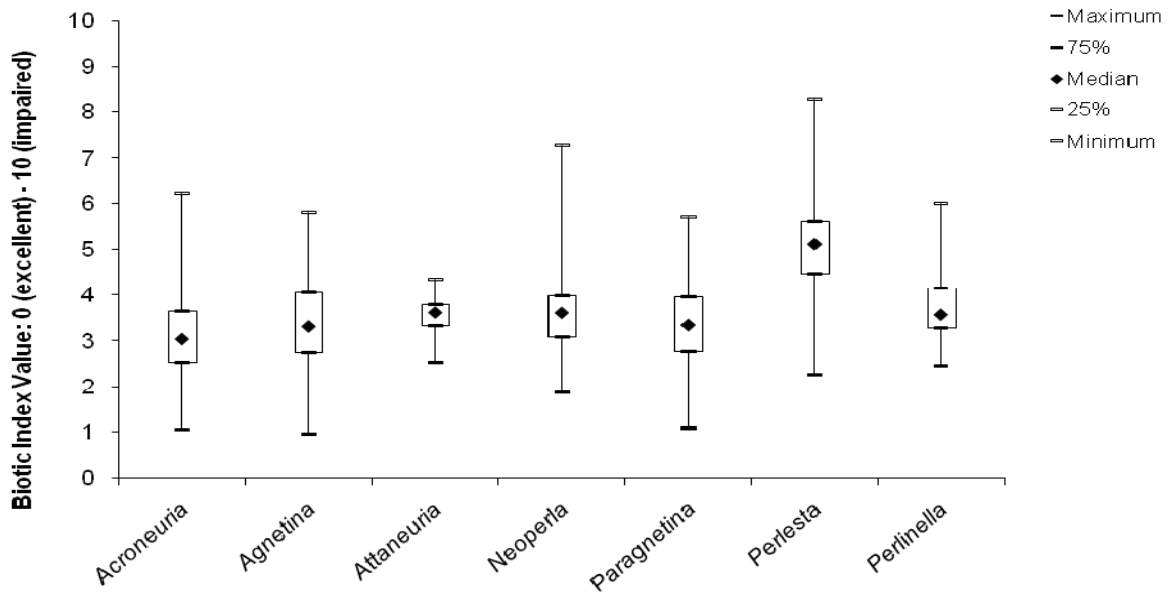
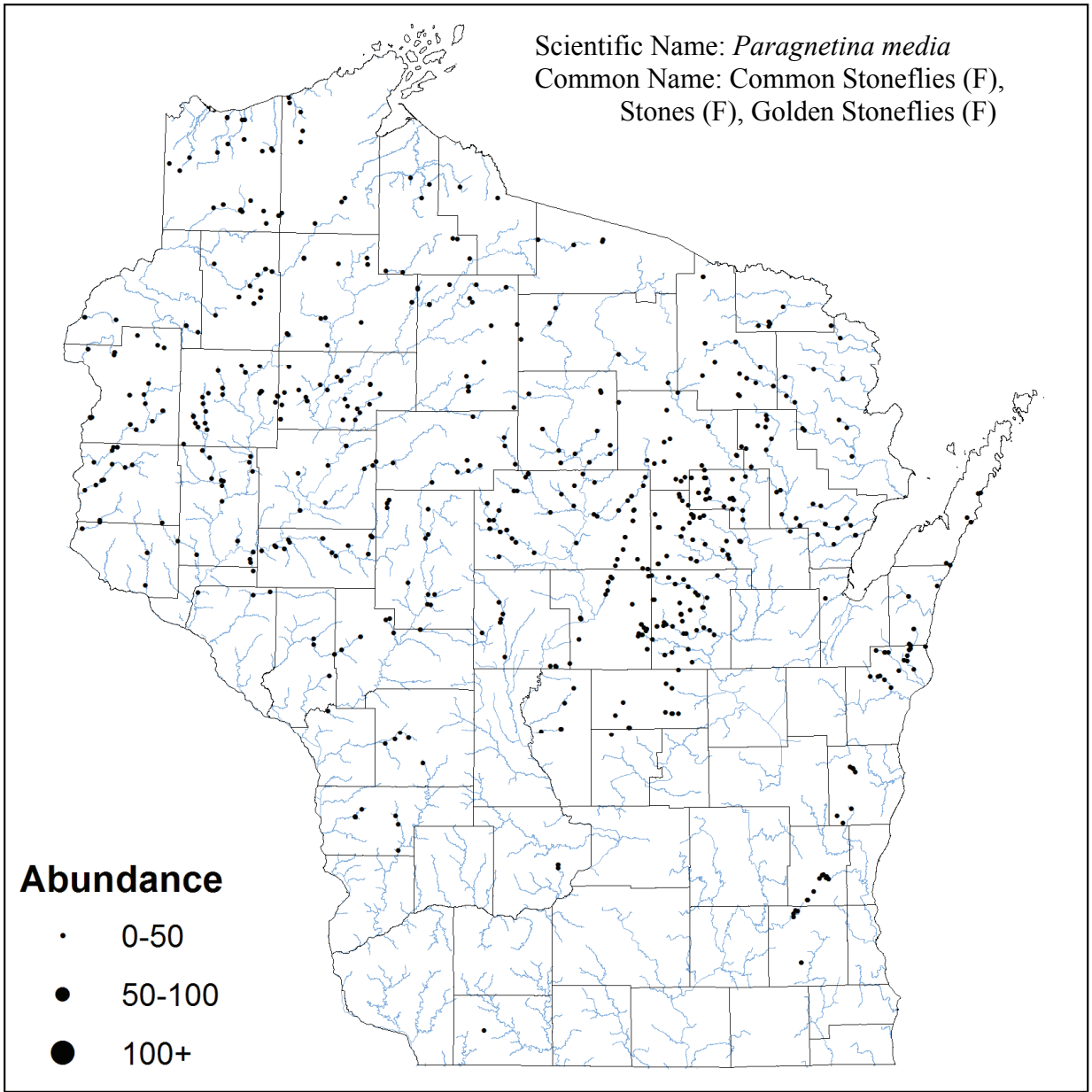
# Plecoptera Perlidae



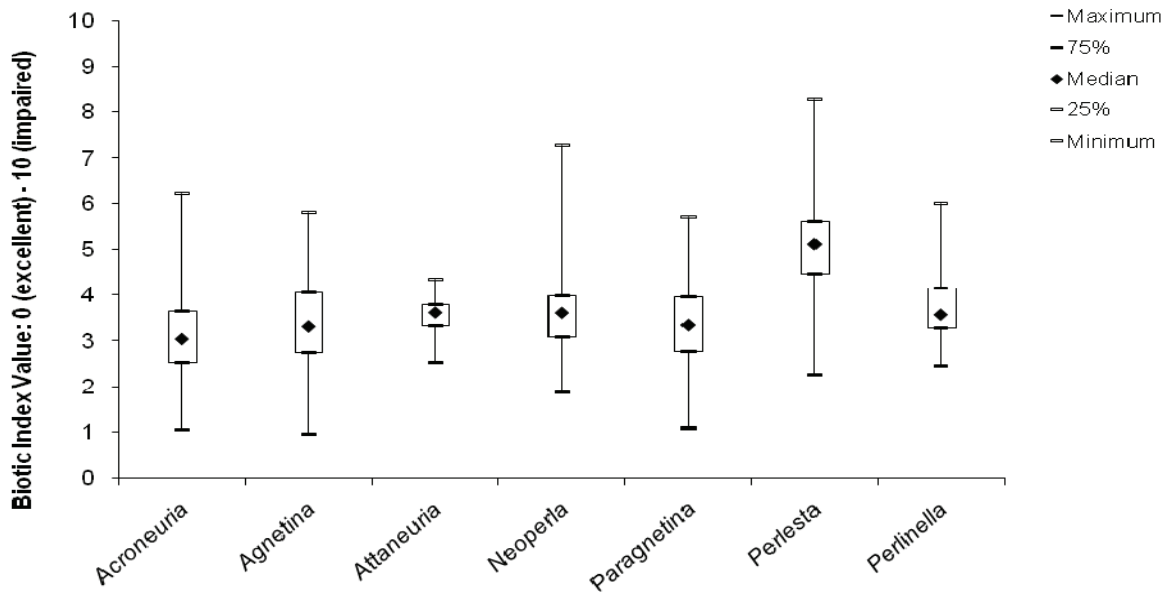
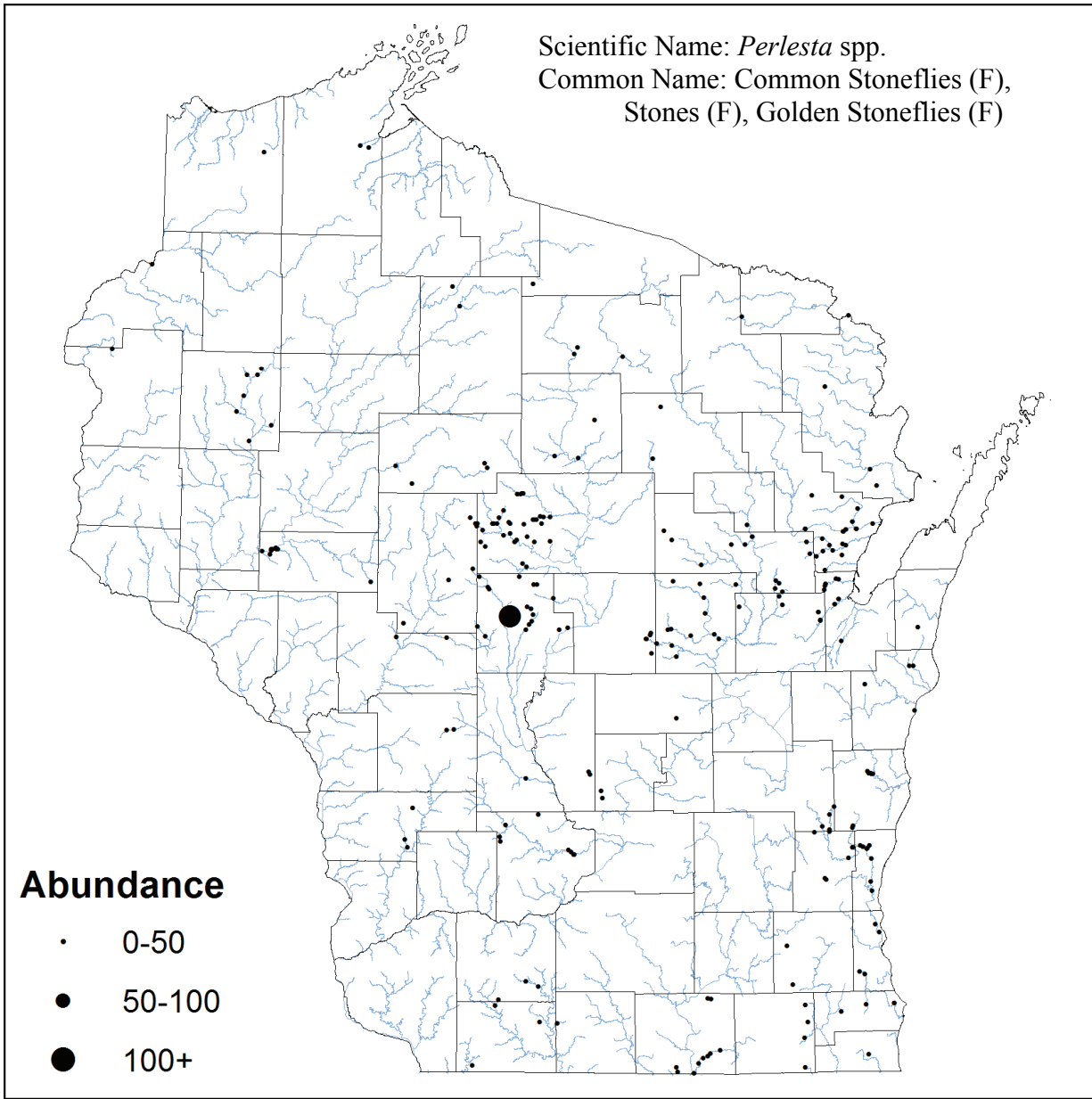
# Plecoptera Perlidae



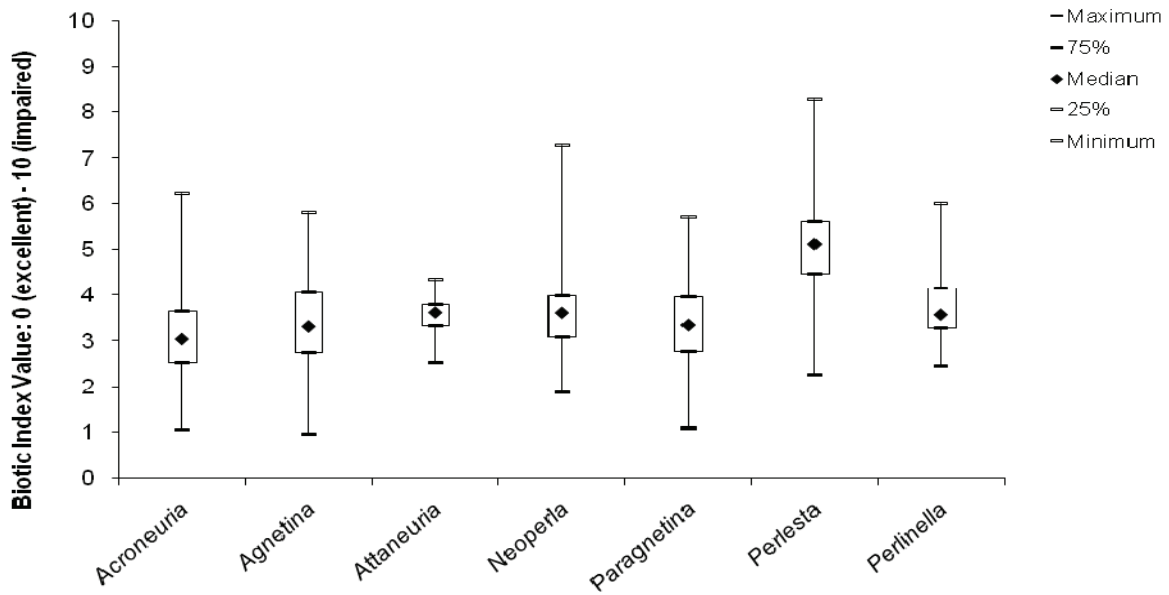
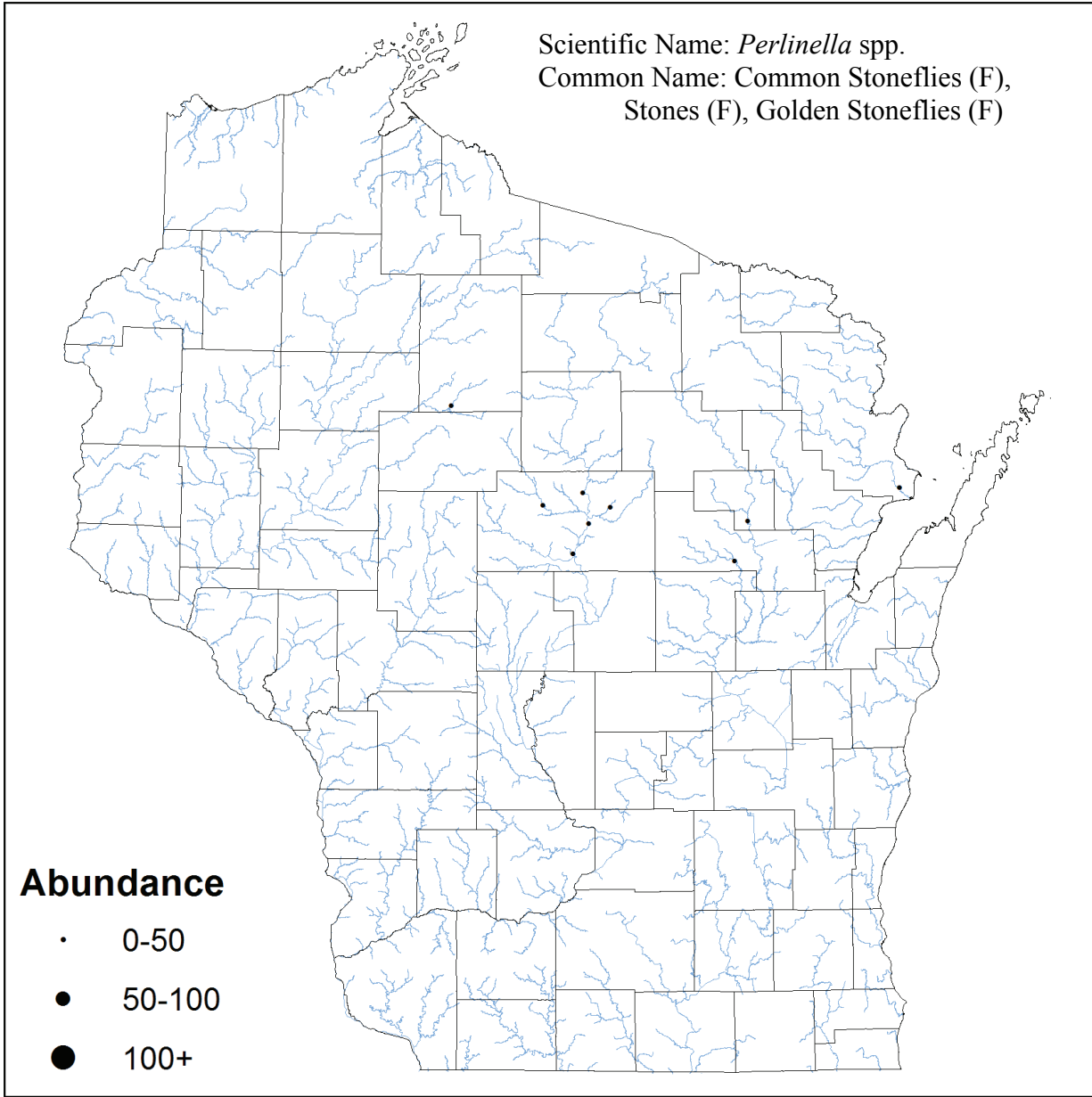
# Plecoptera Perlidae



# Plecoptera Perlidae

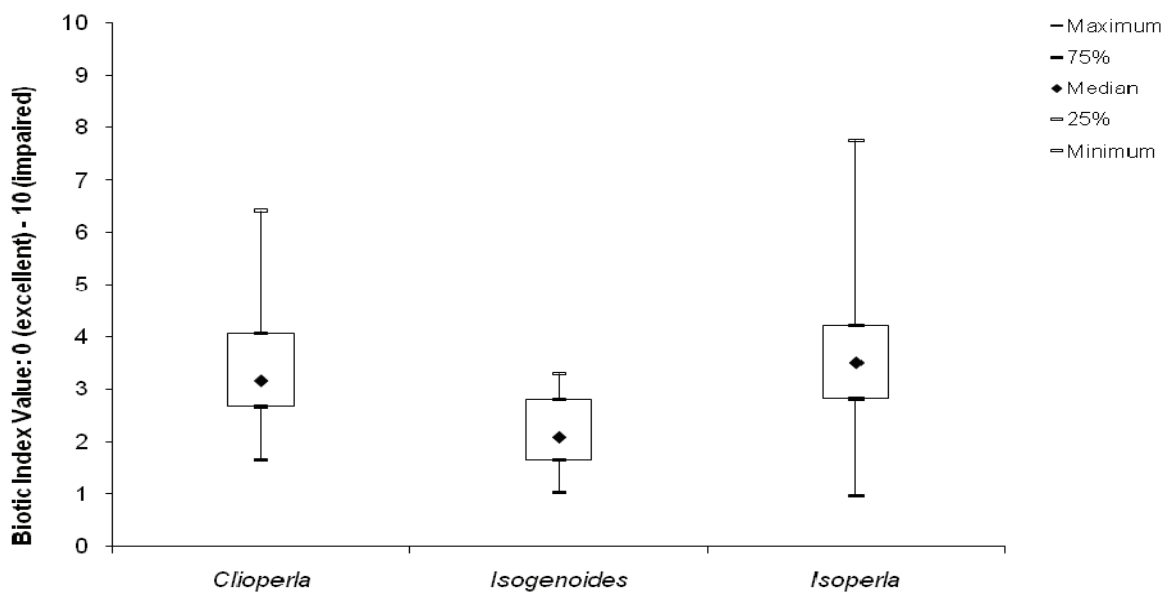
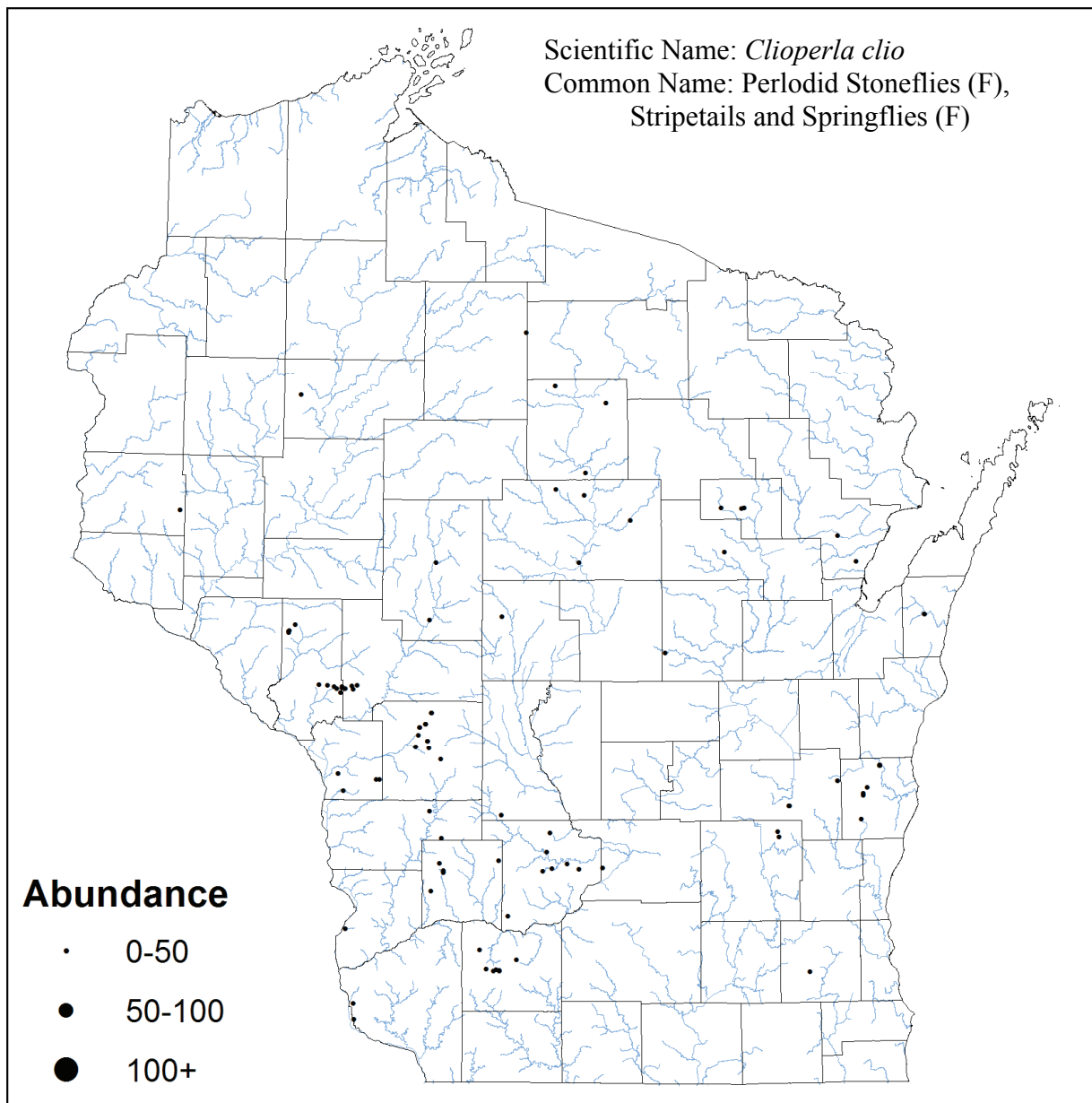


# Plecoptera Perlidae

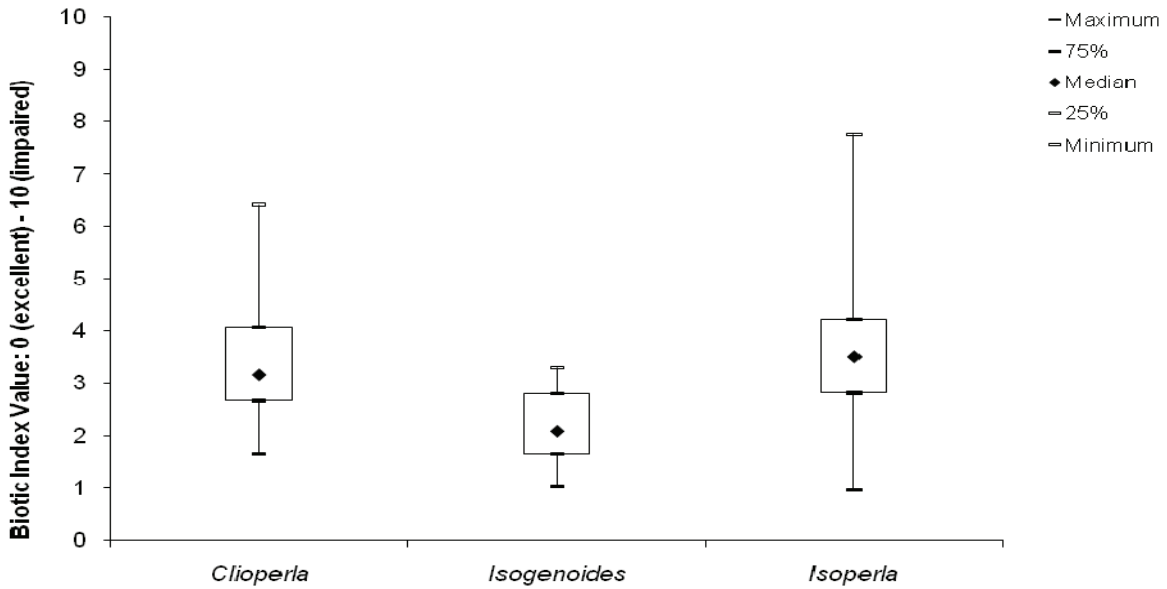
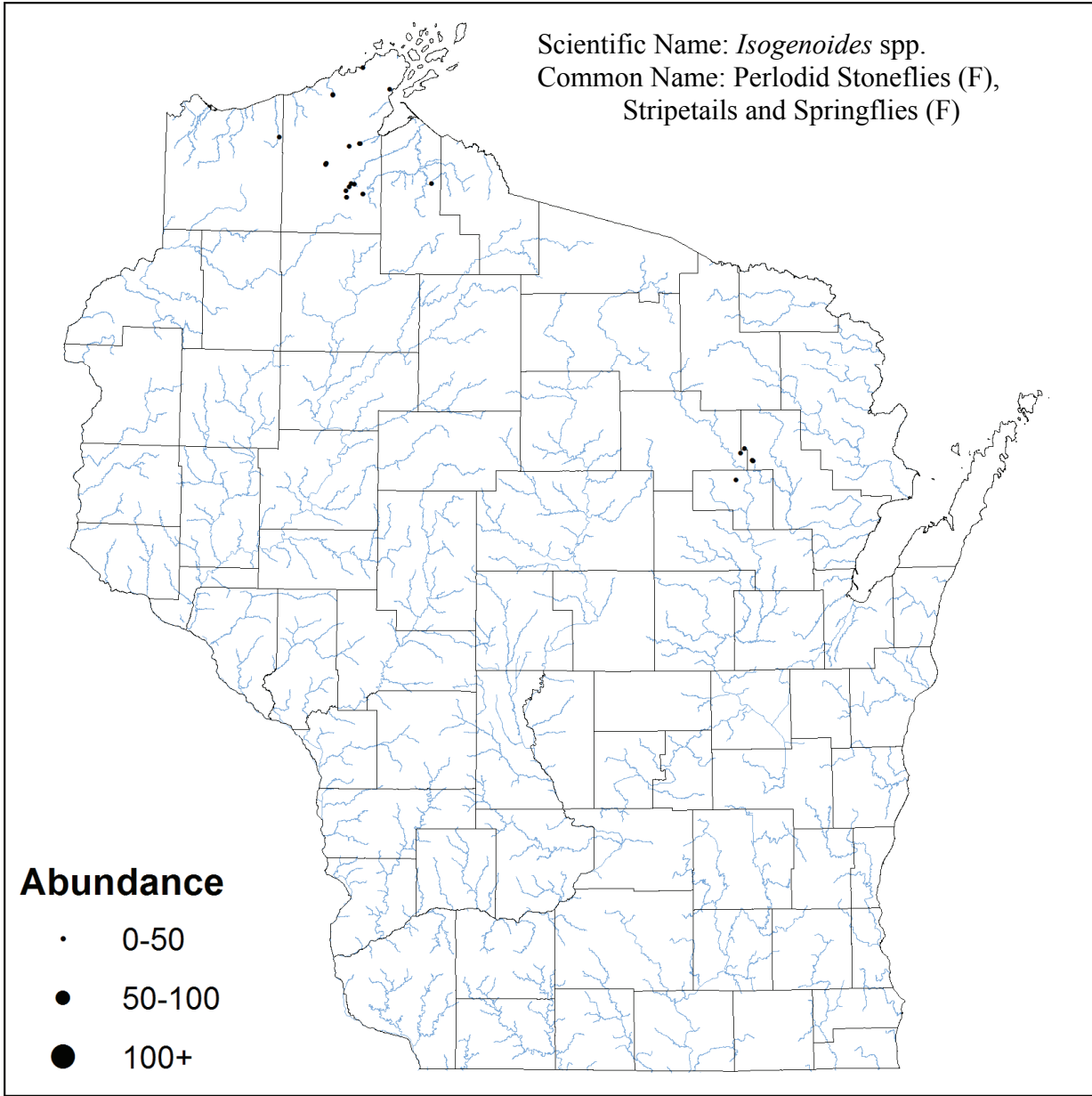




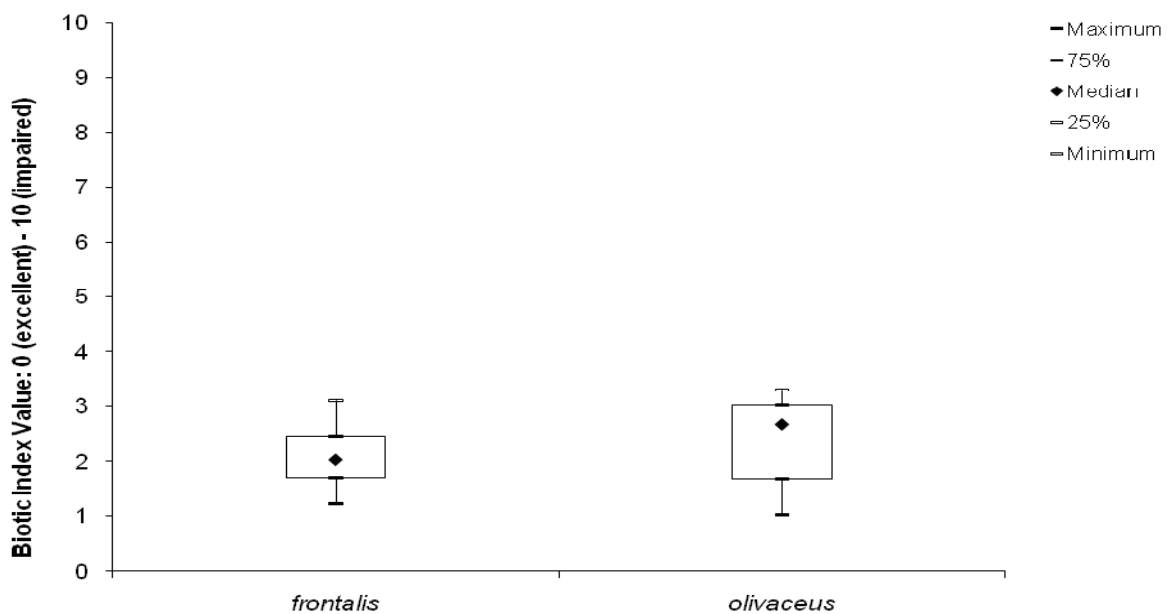
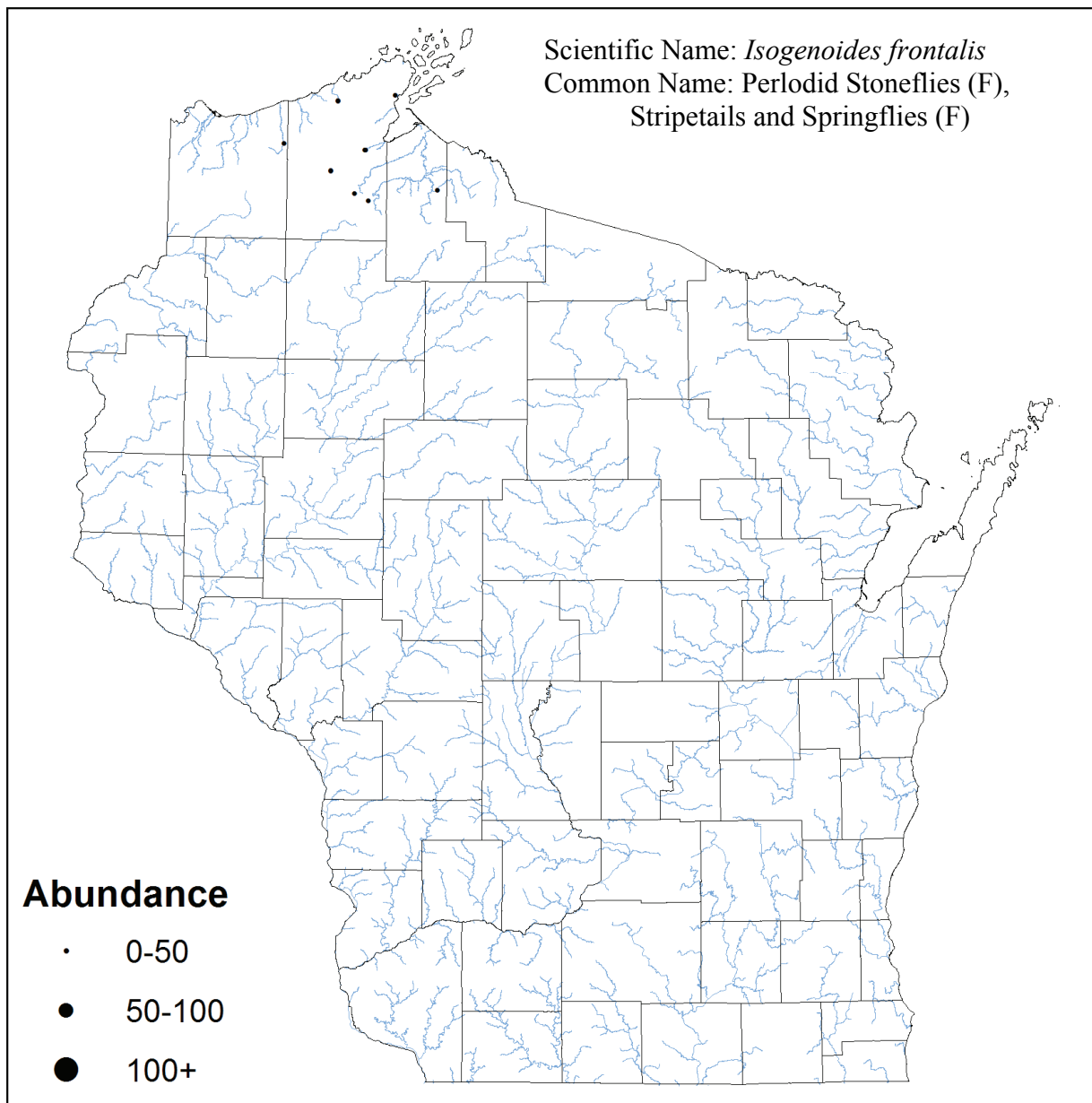
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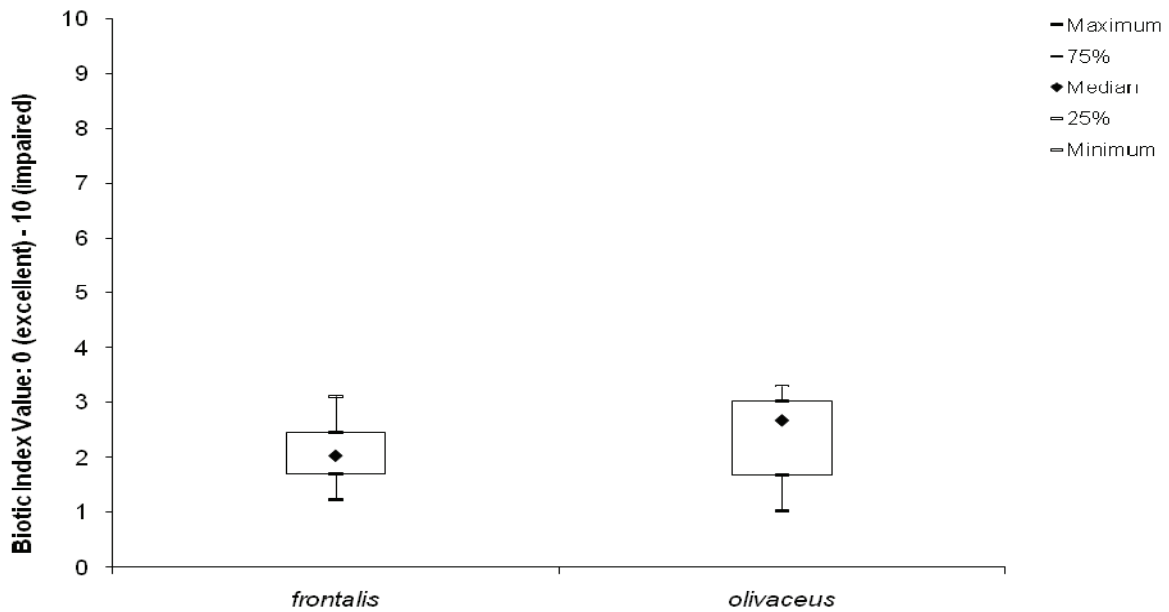
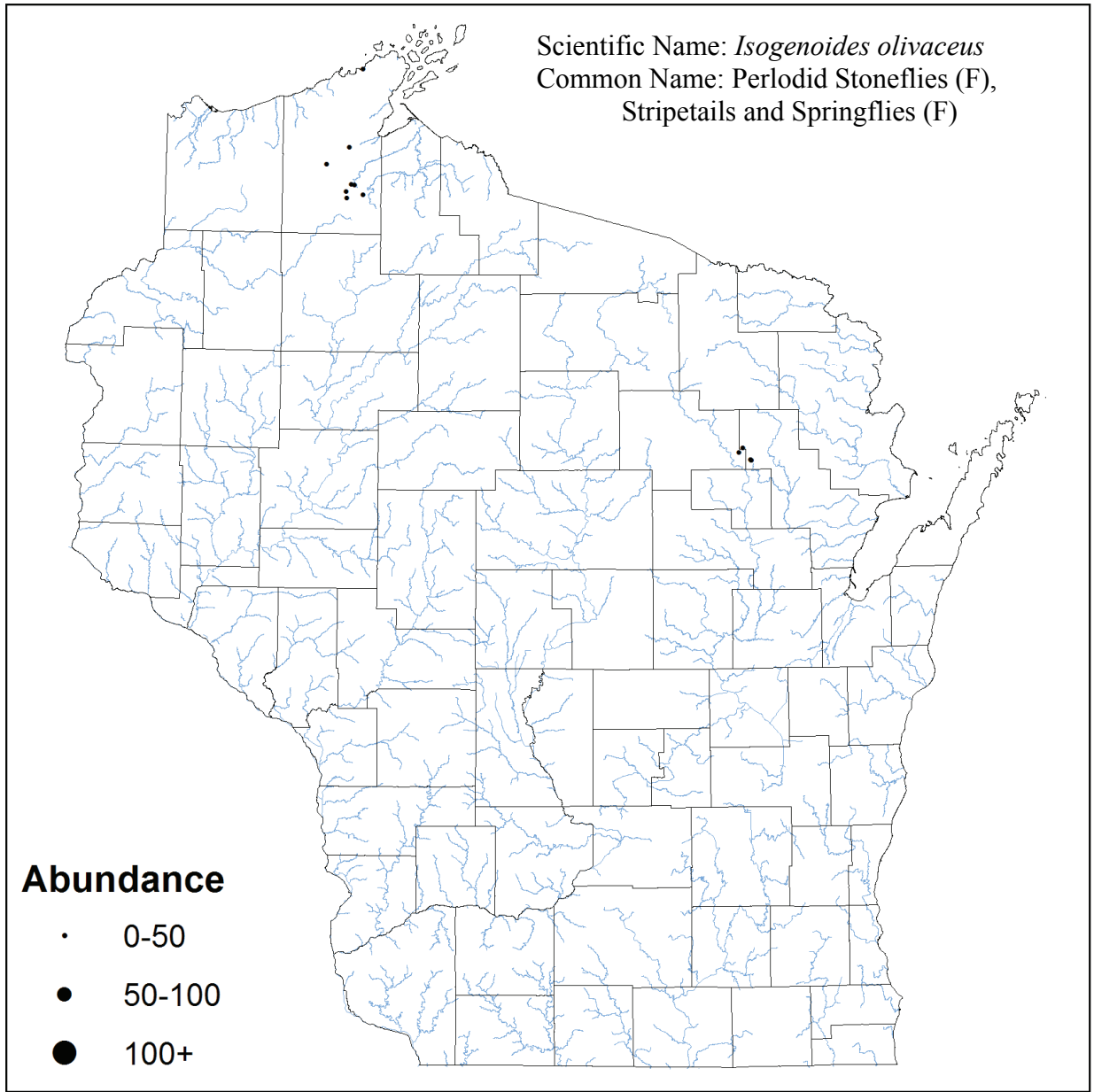
# Plecoptera Perlodidae



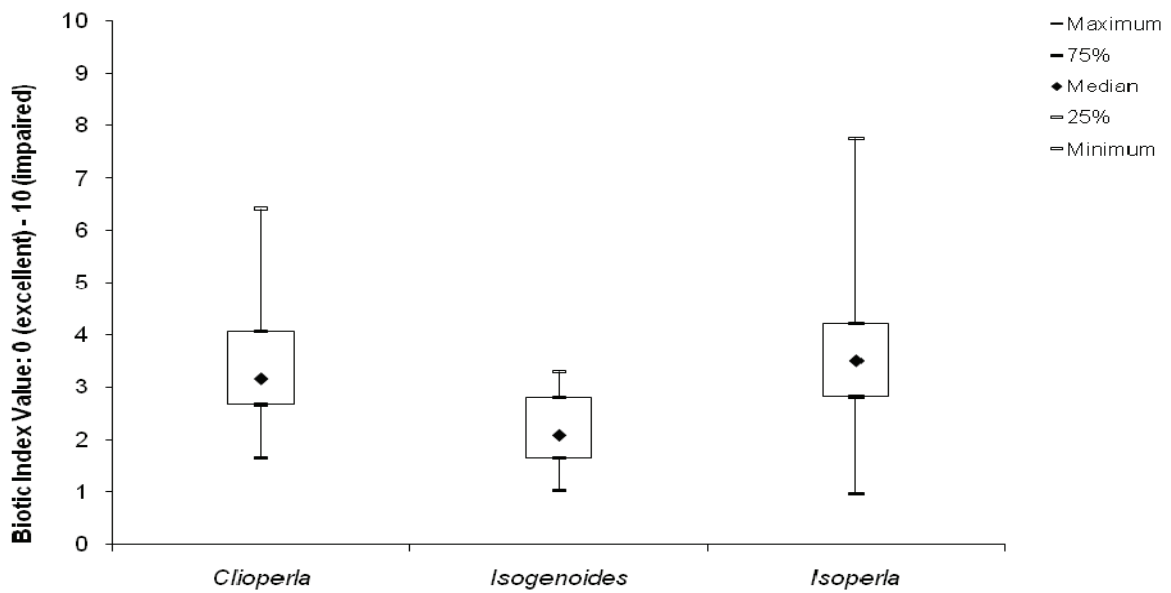
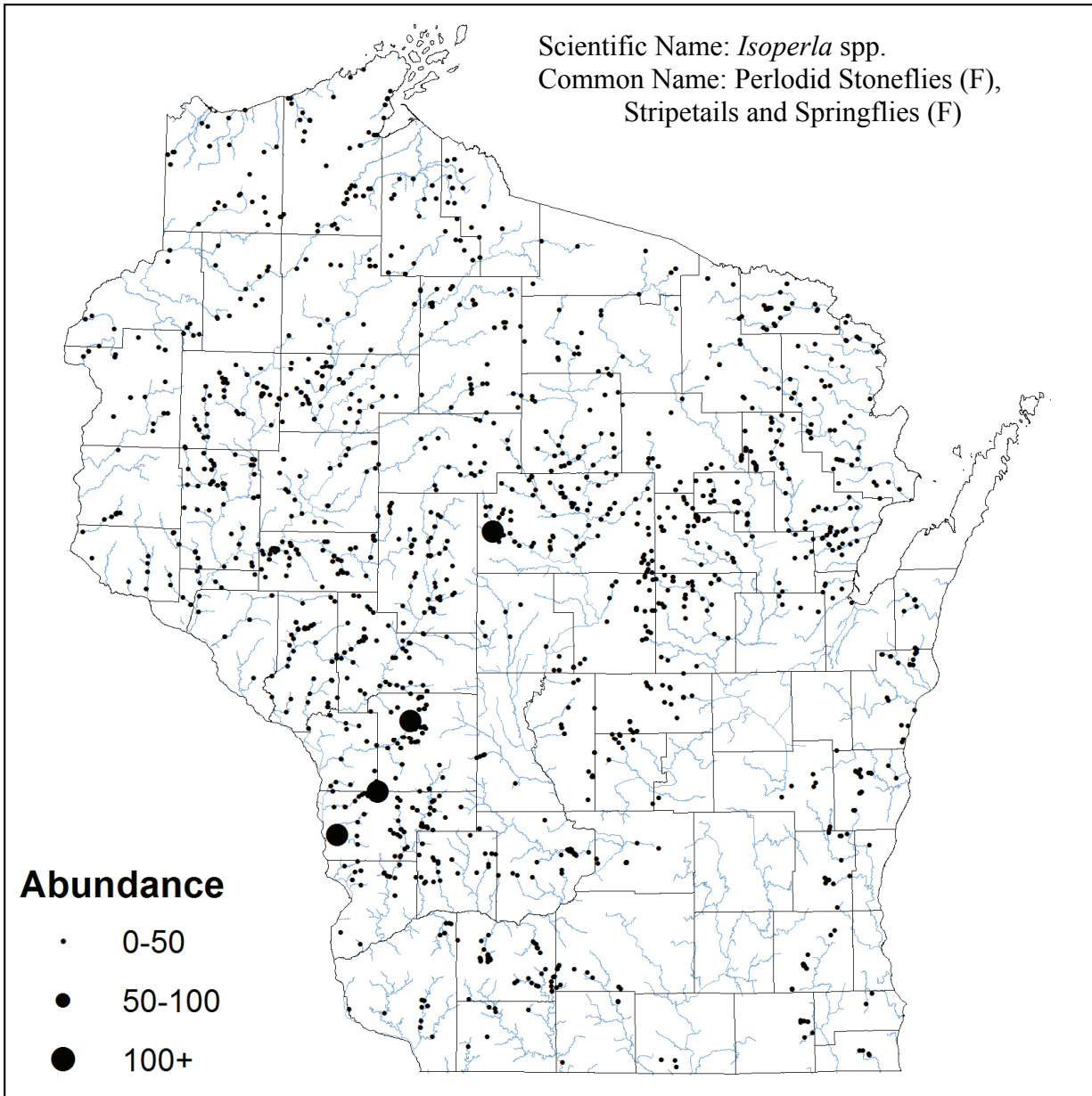
# Plecoptera Perlodidae



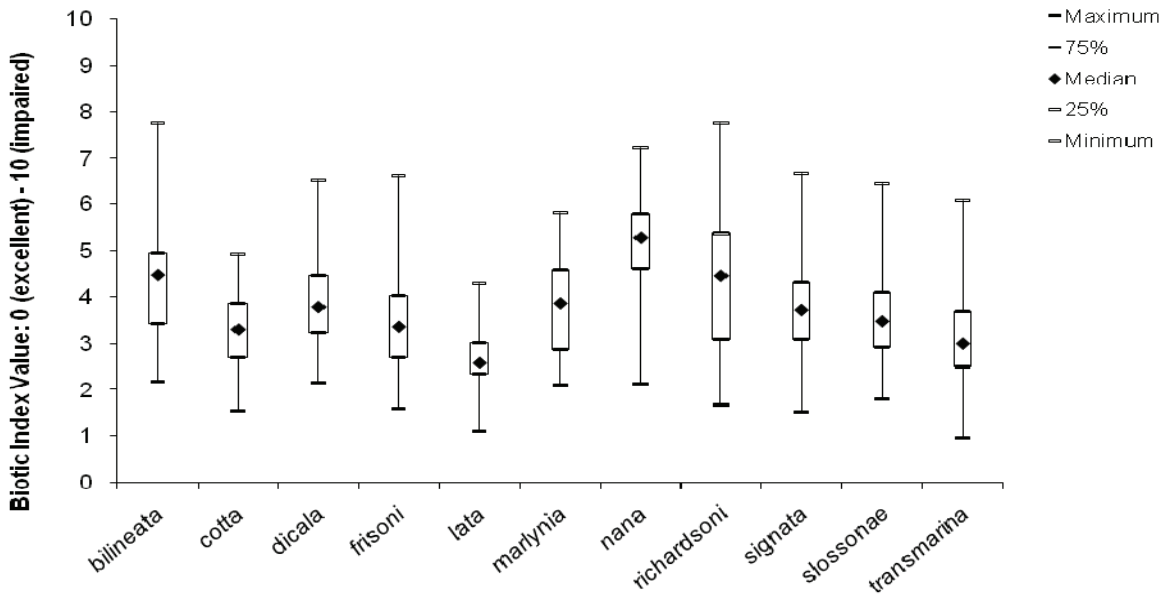
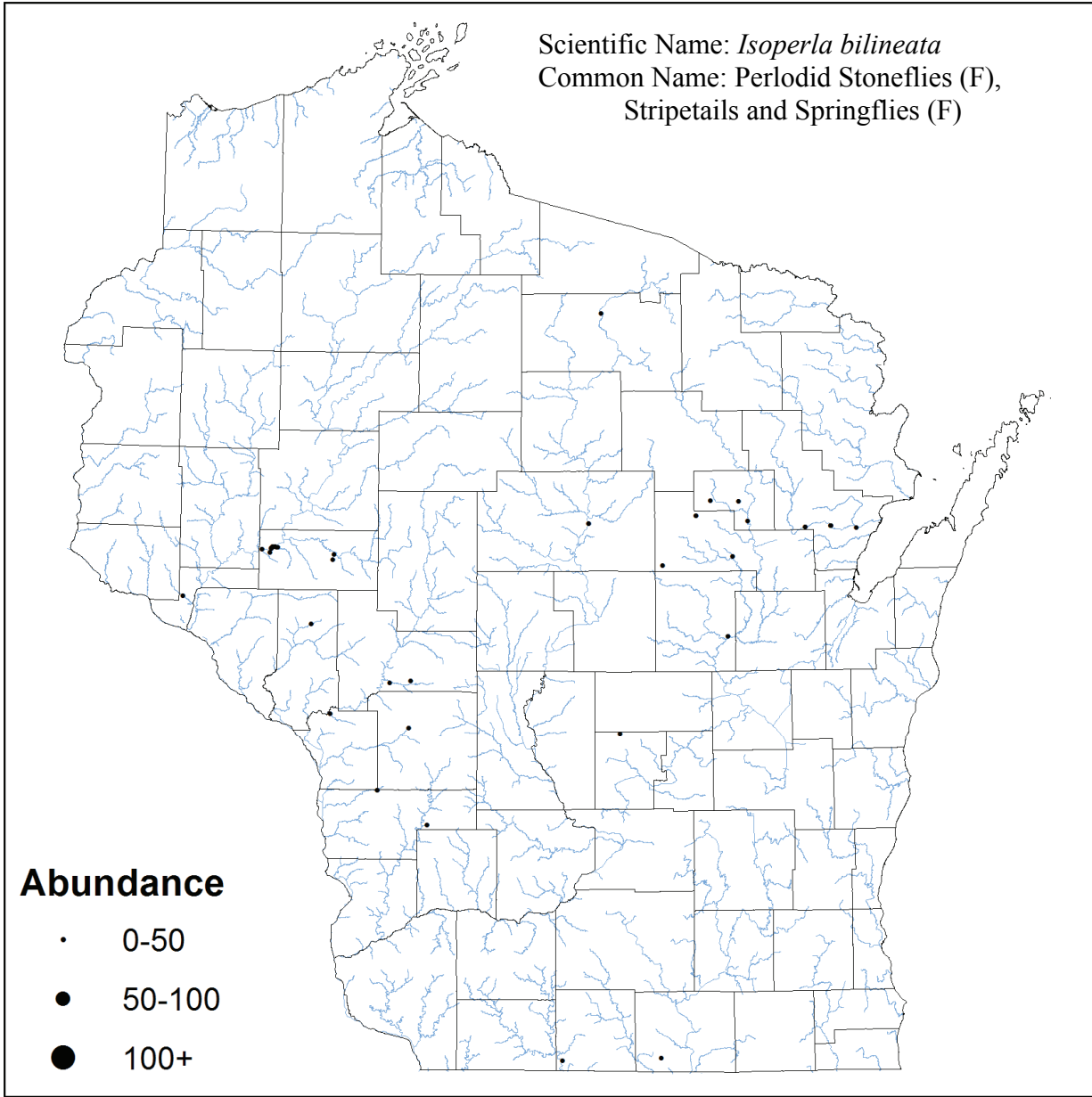
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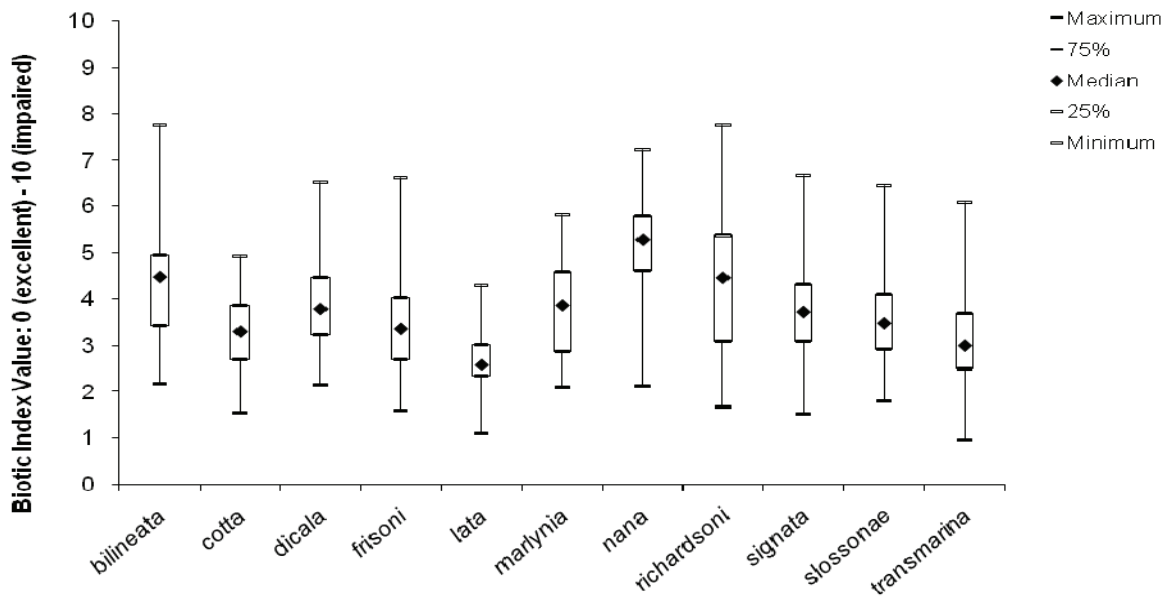
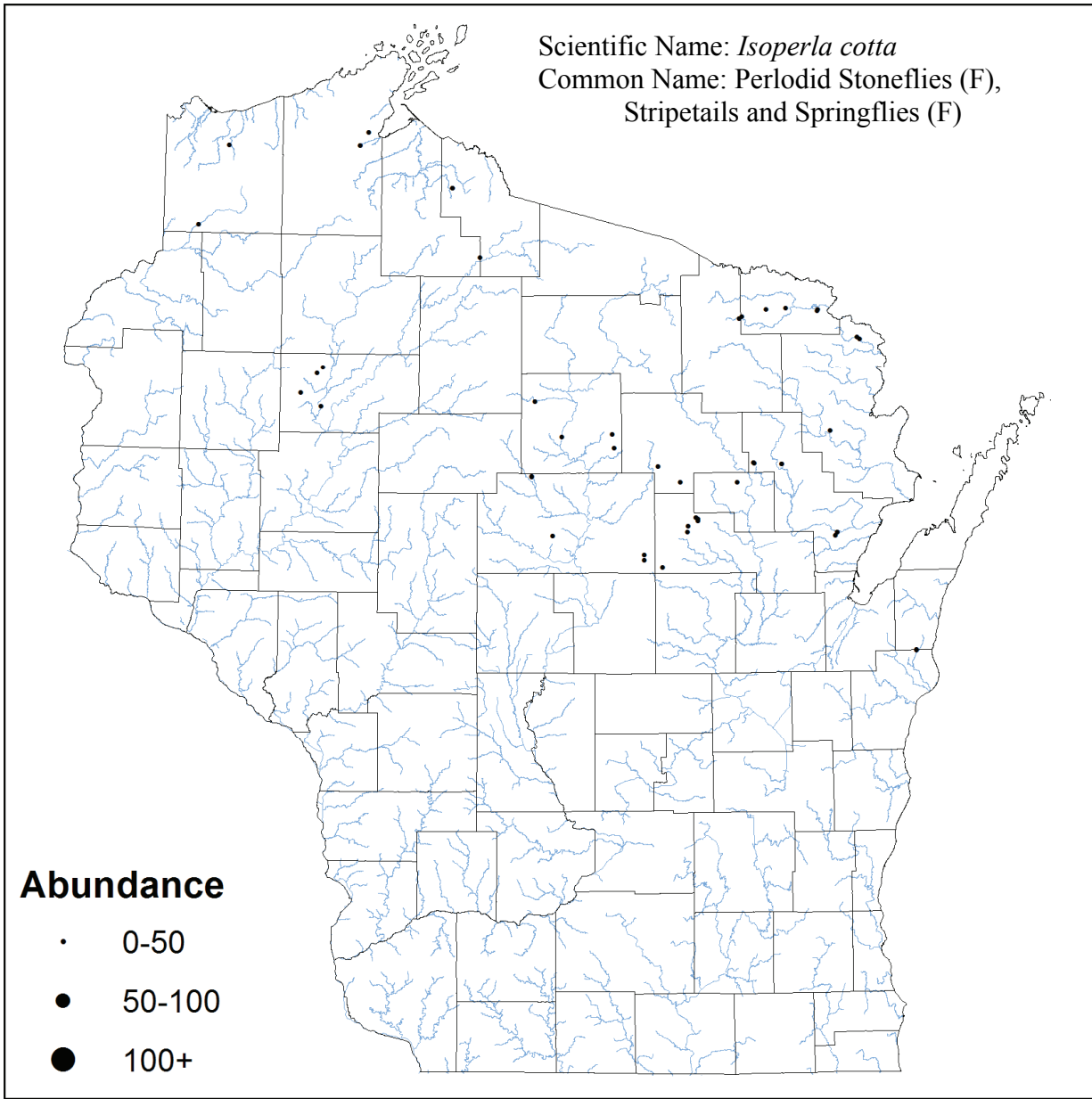
# Plecoptera Perlodidae



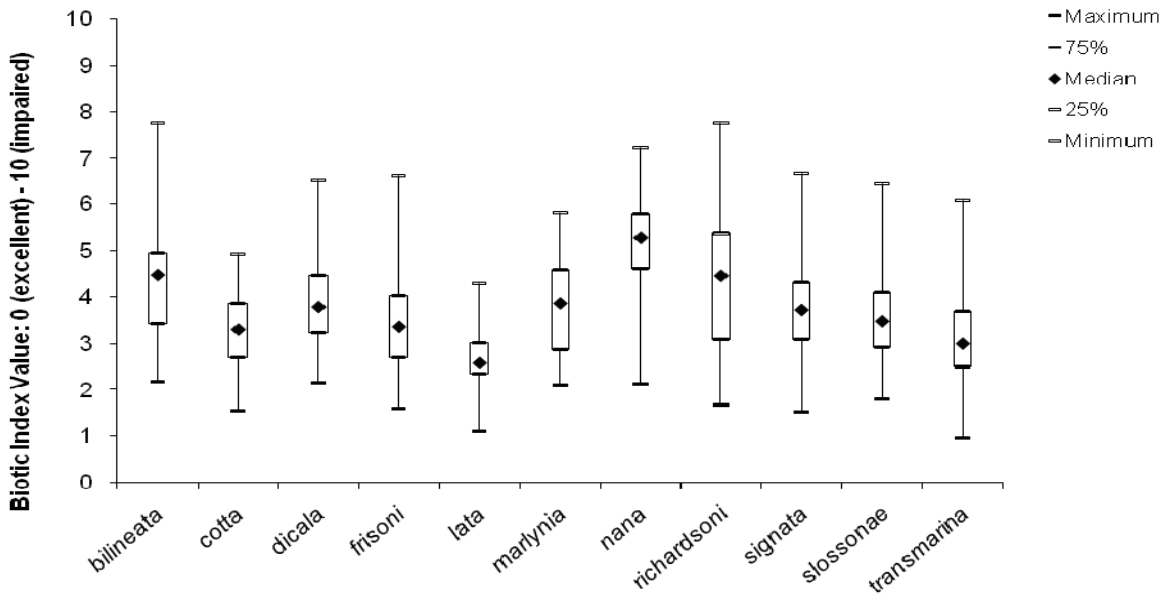
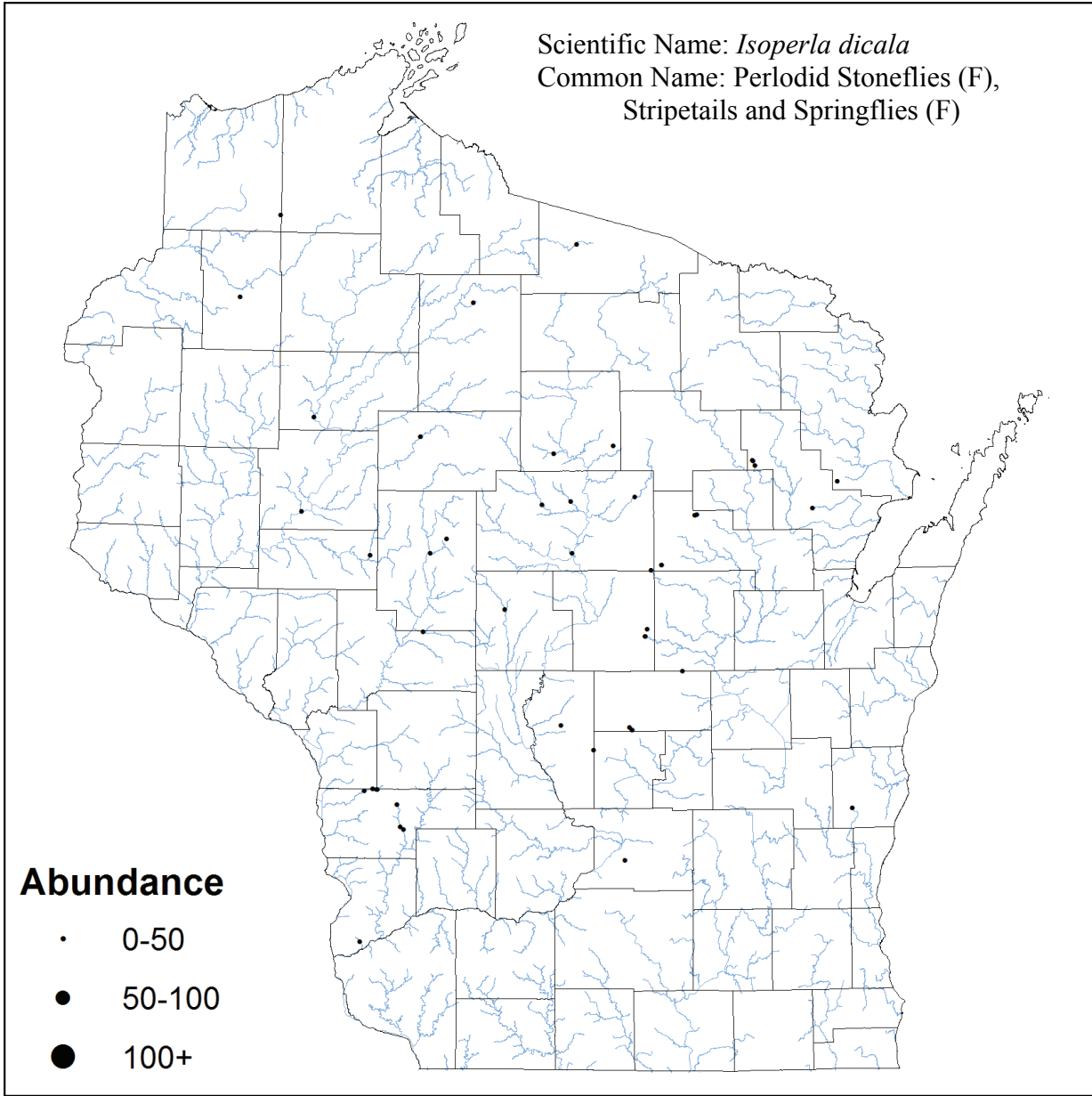
# Plecoptera Perlodidae



# Plecoptera Perlodidae

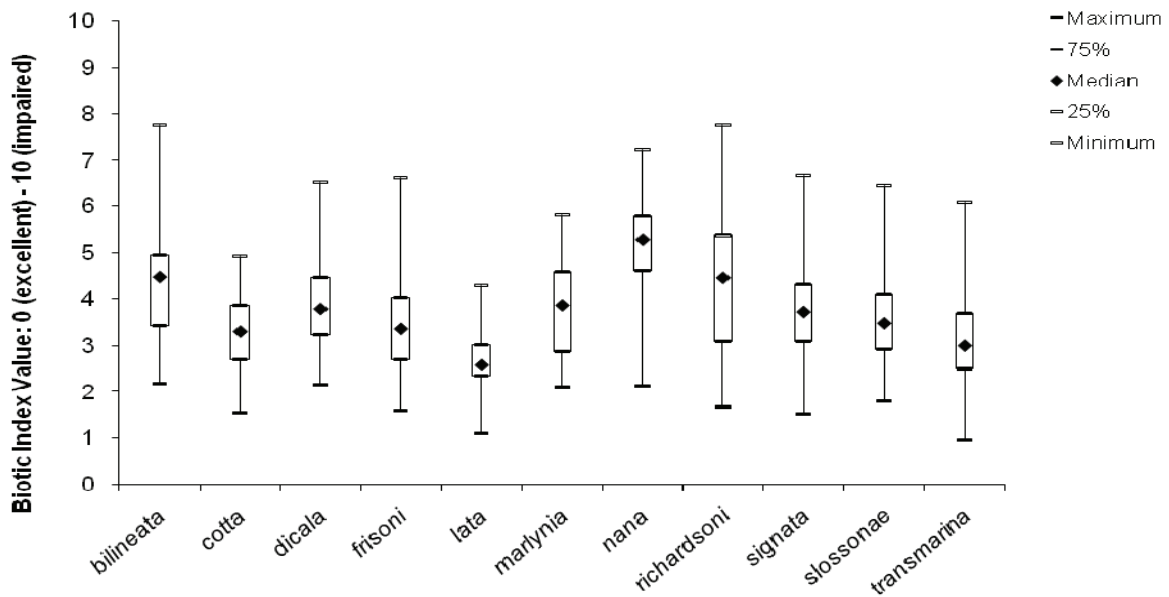
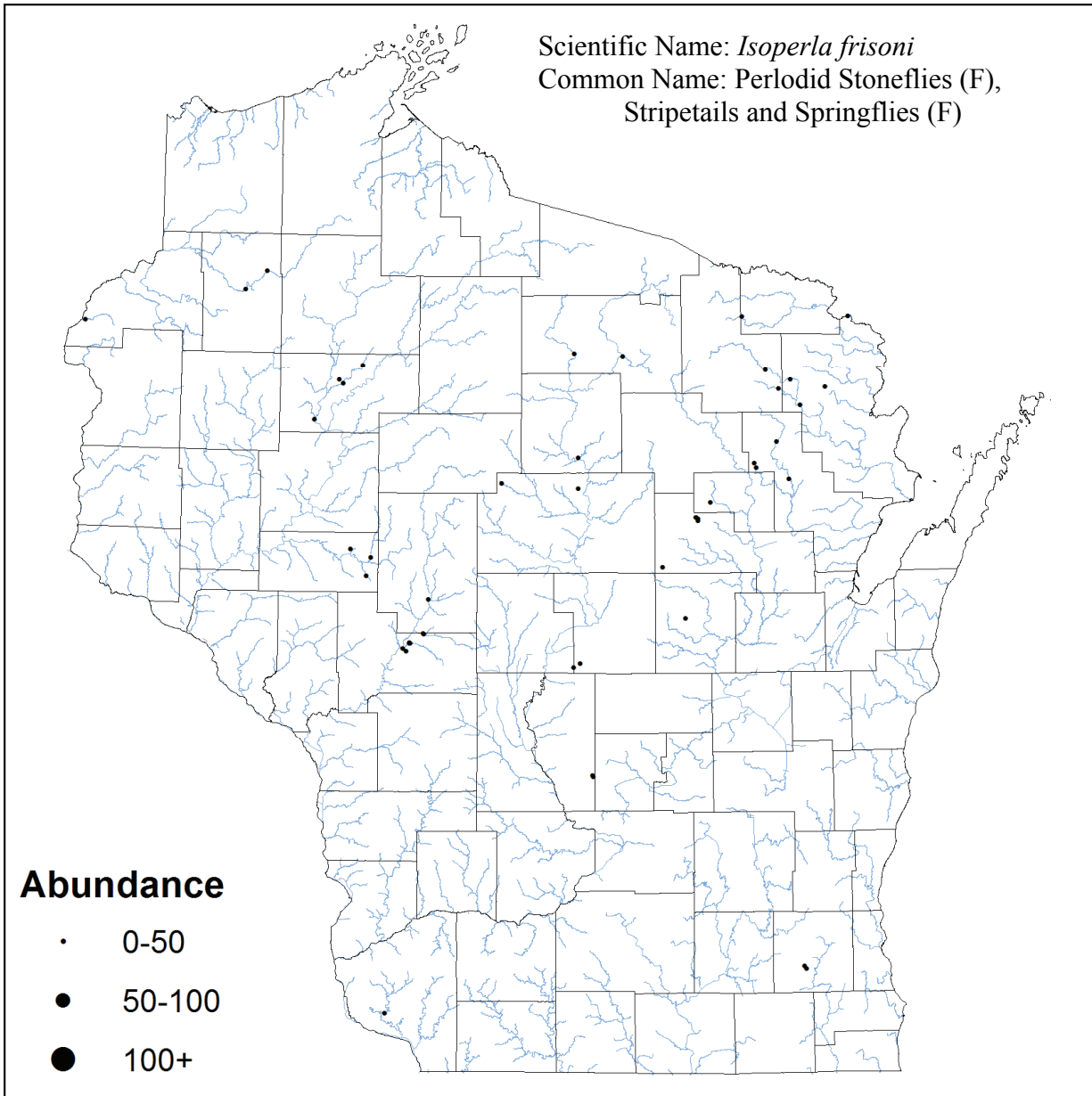


# Plecoptera Perlodidae

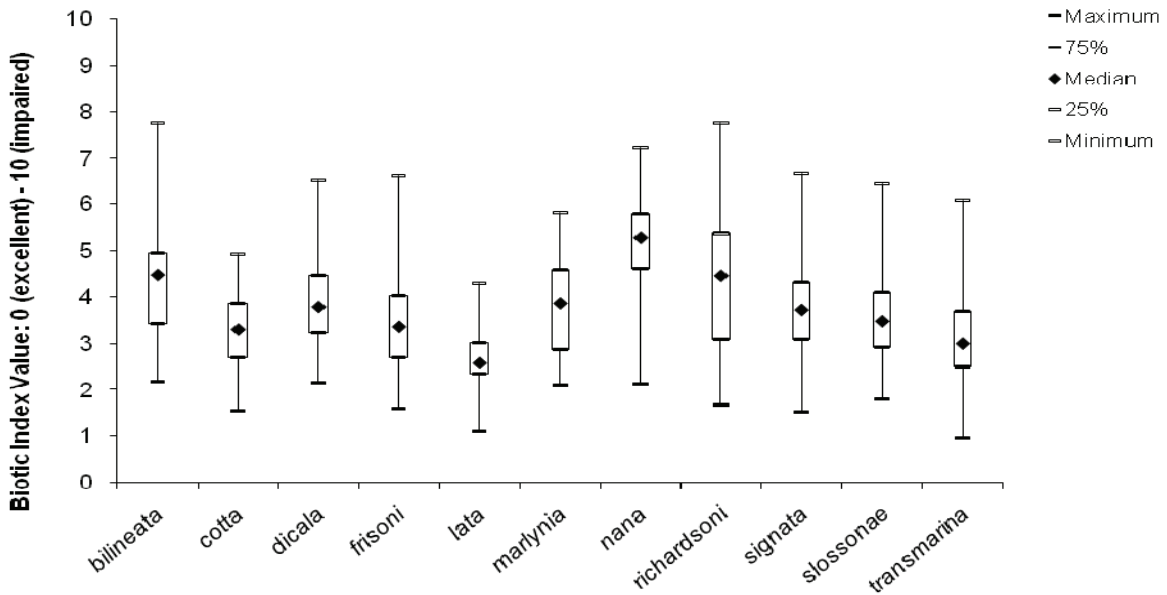
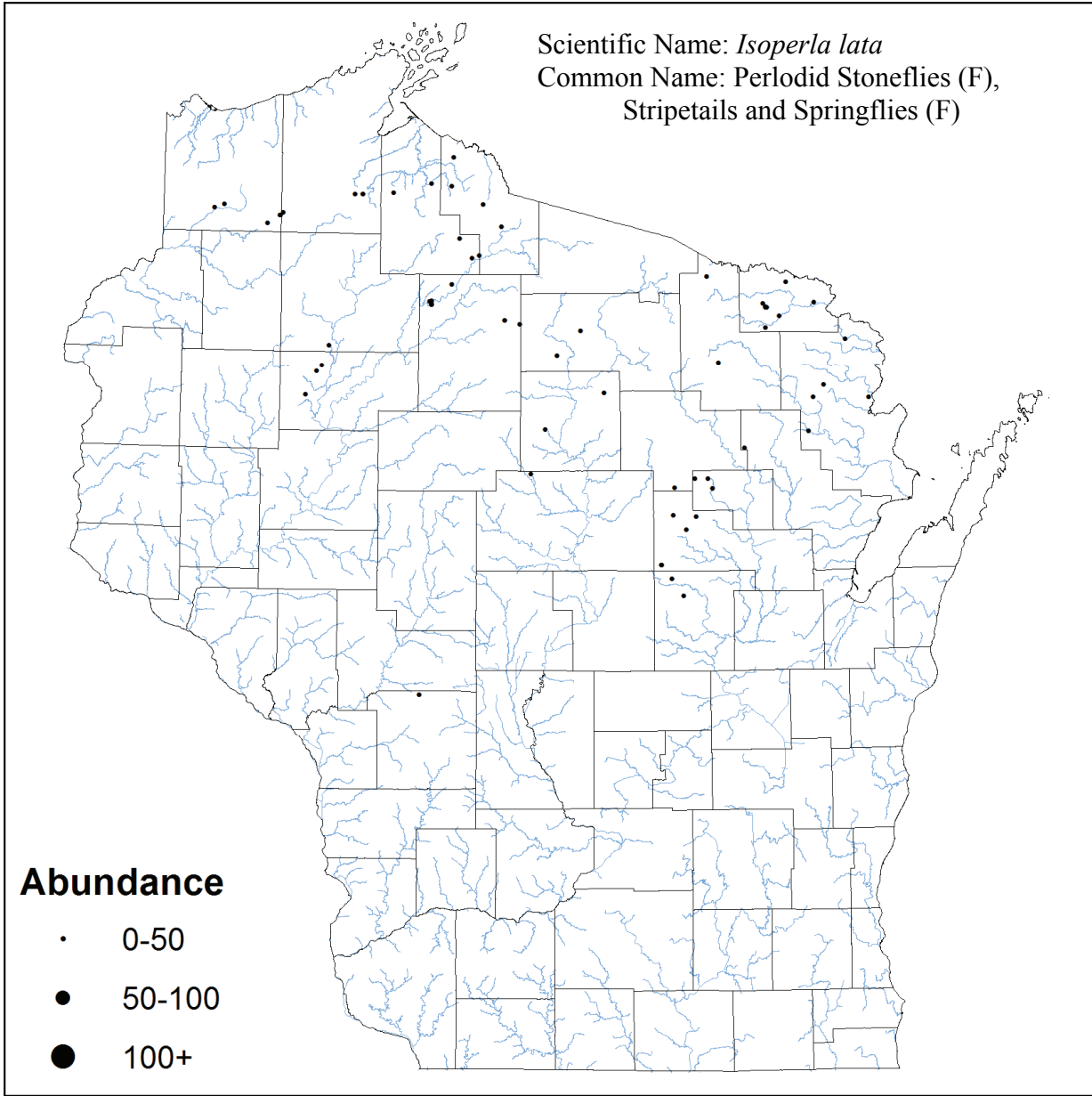




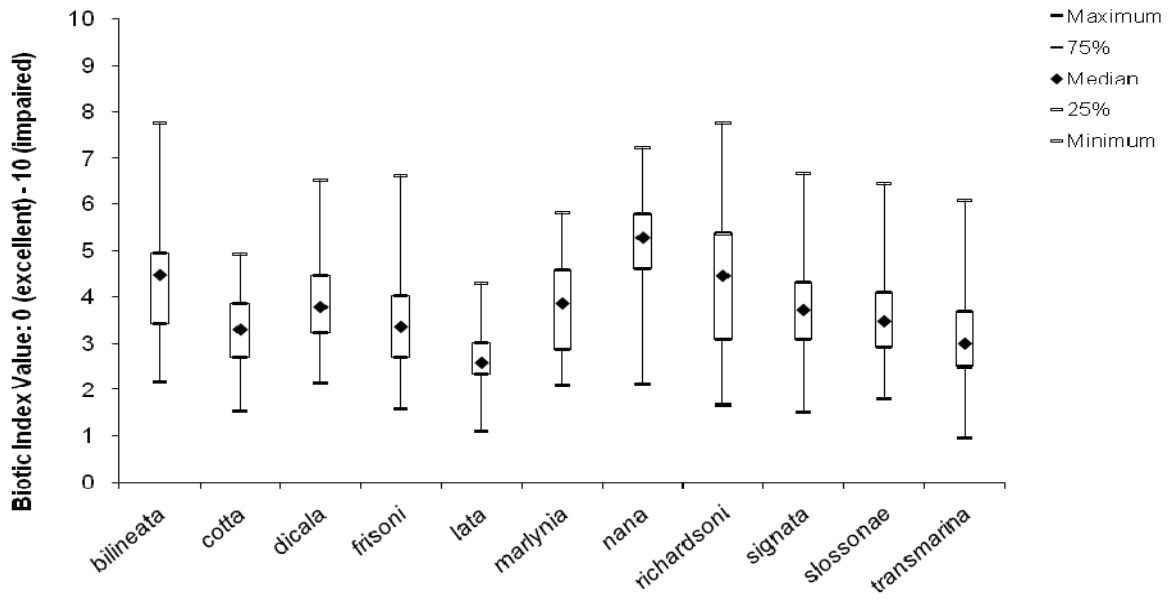
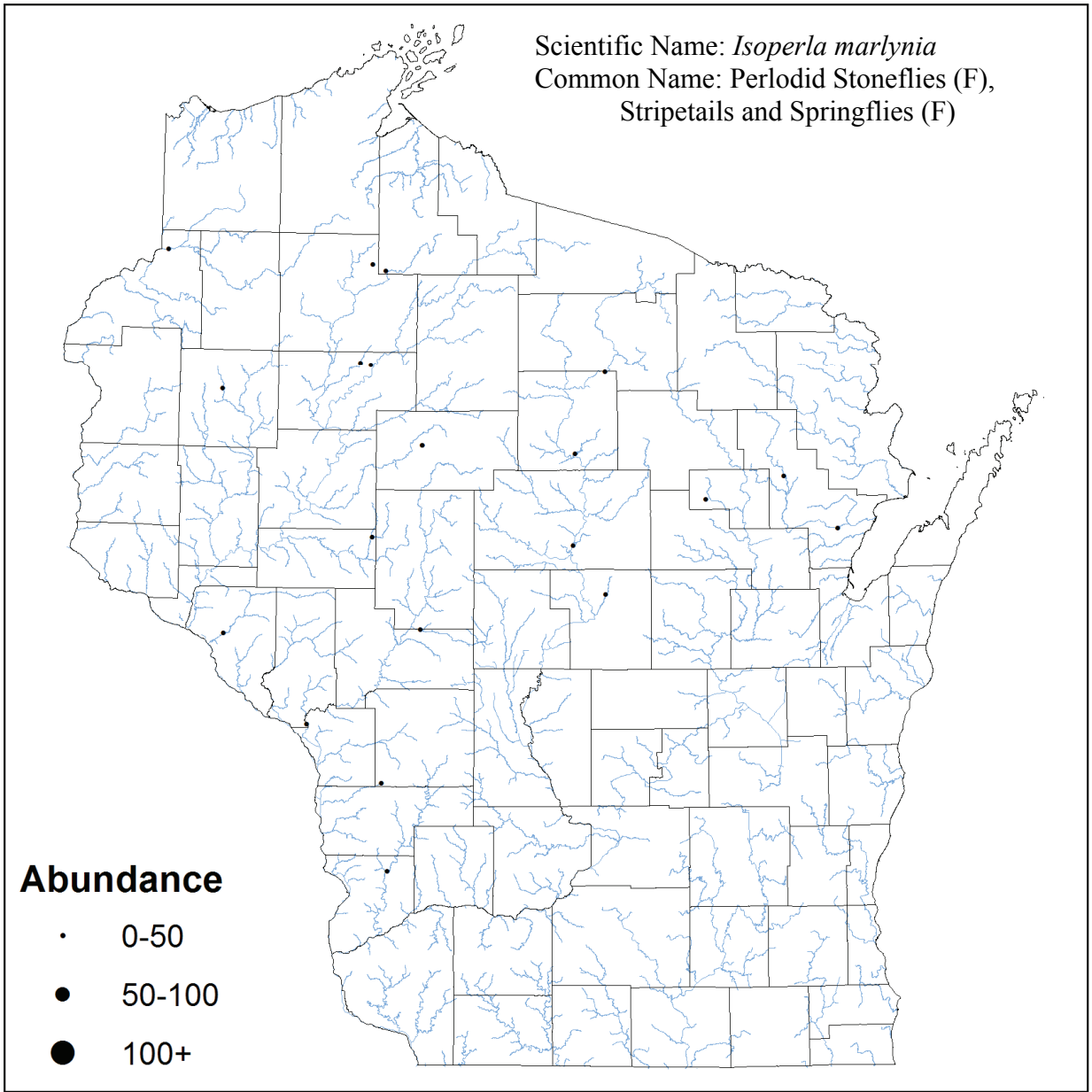
# Plecoptera Perlodidae



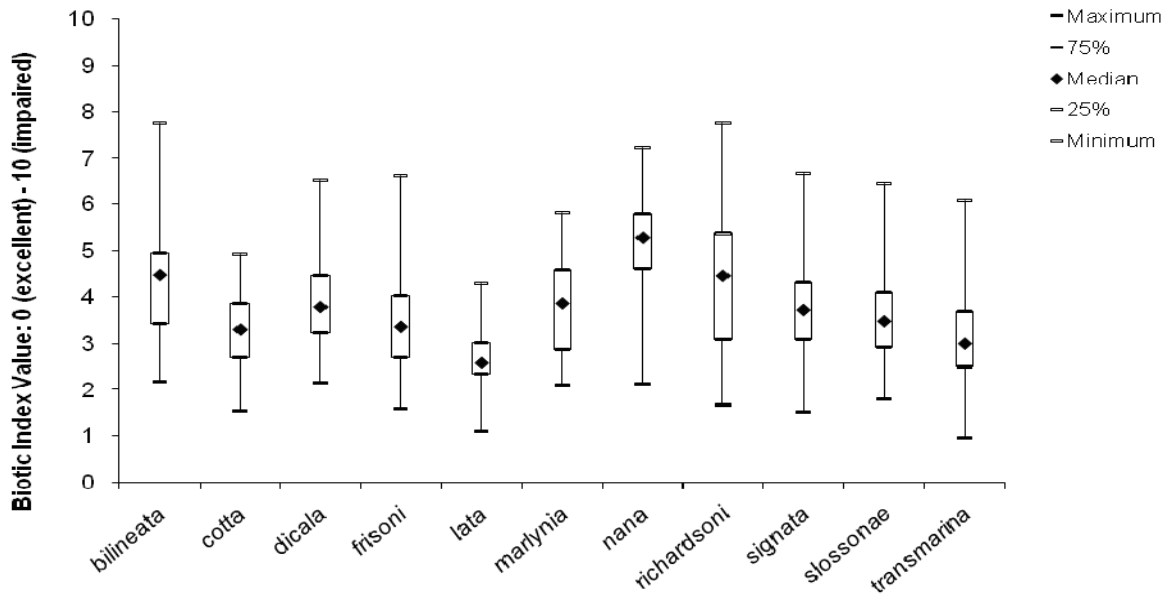
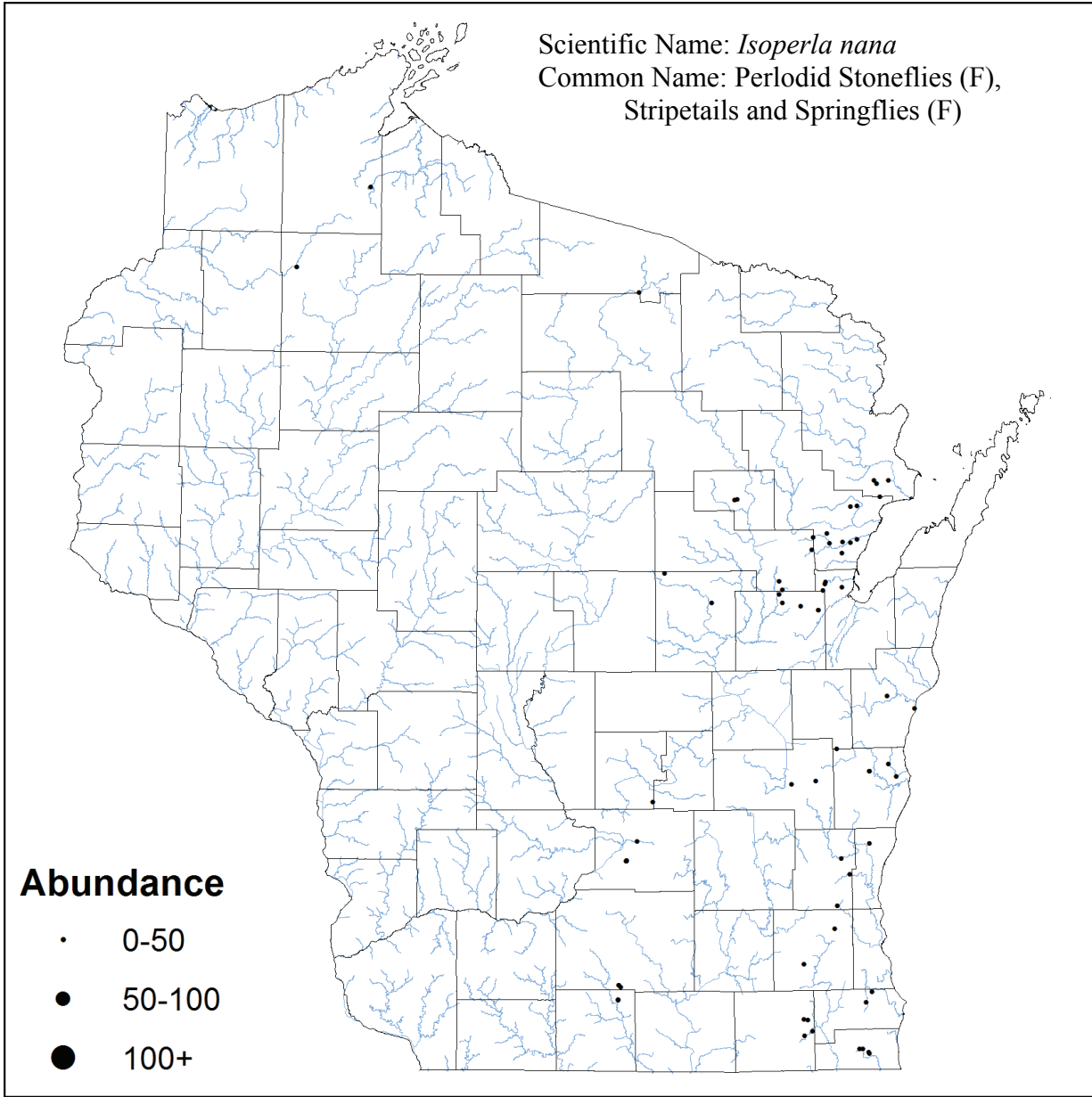
# Plecoptera Perlodidae



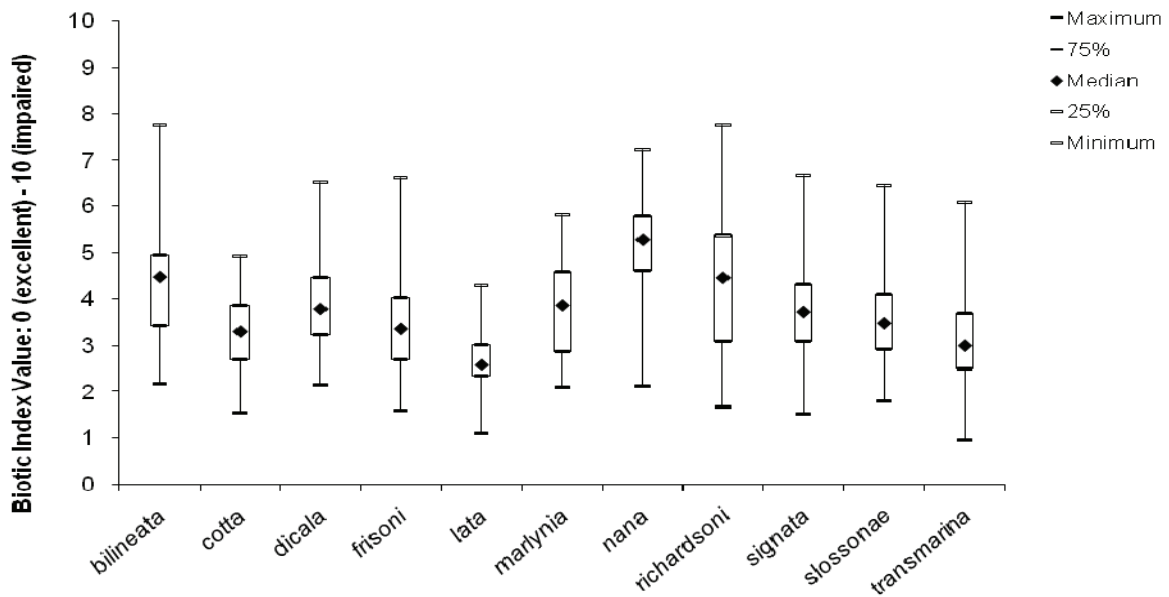
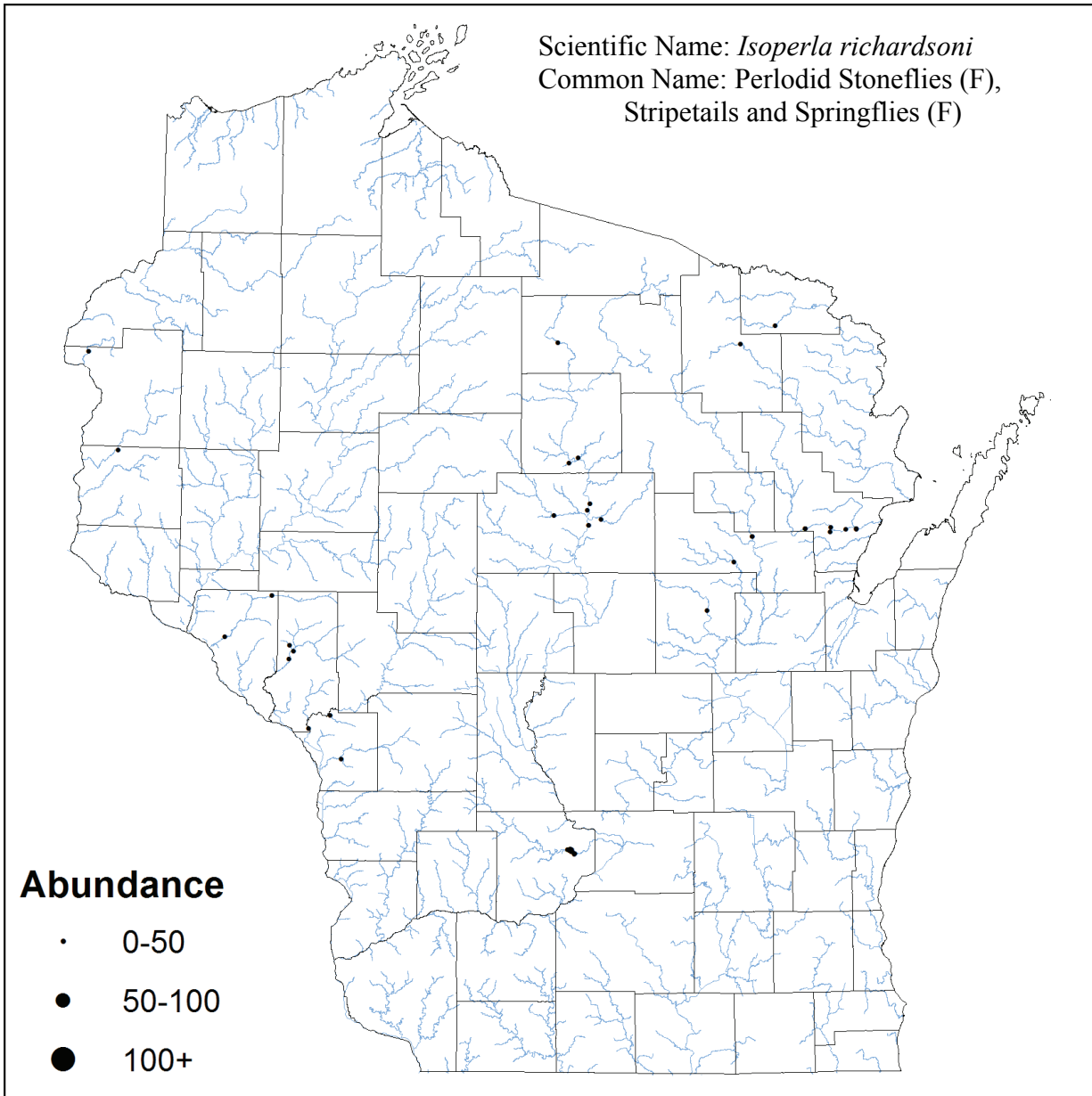
# Plecoptera Perlodidae



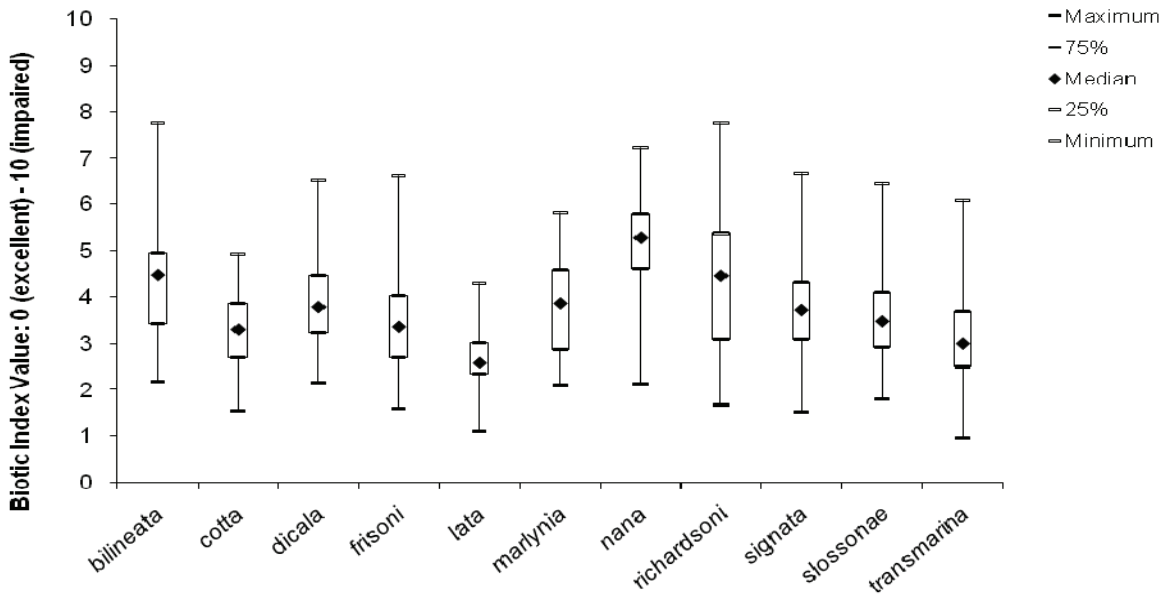
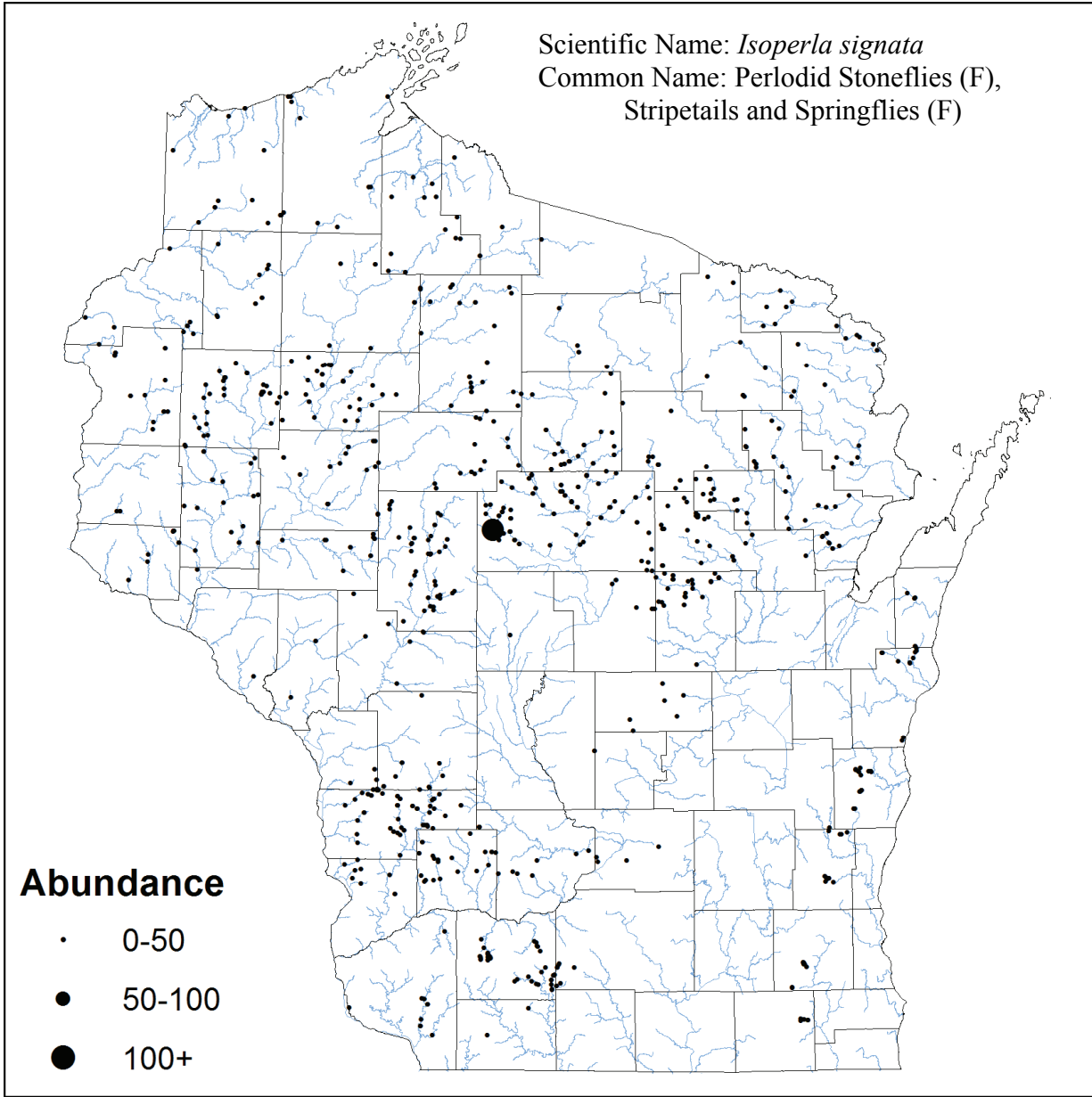
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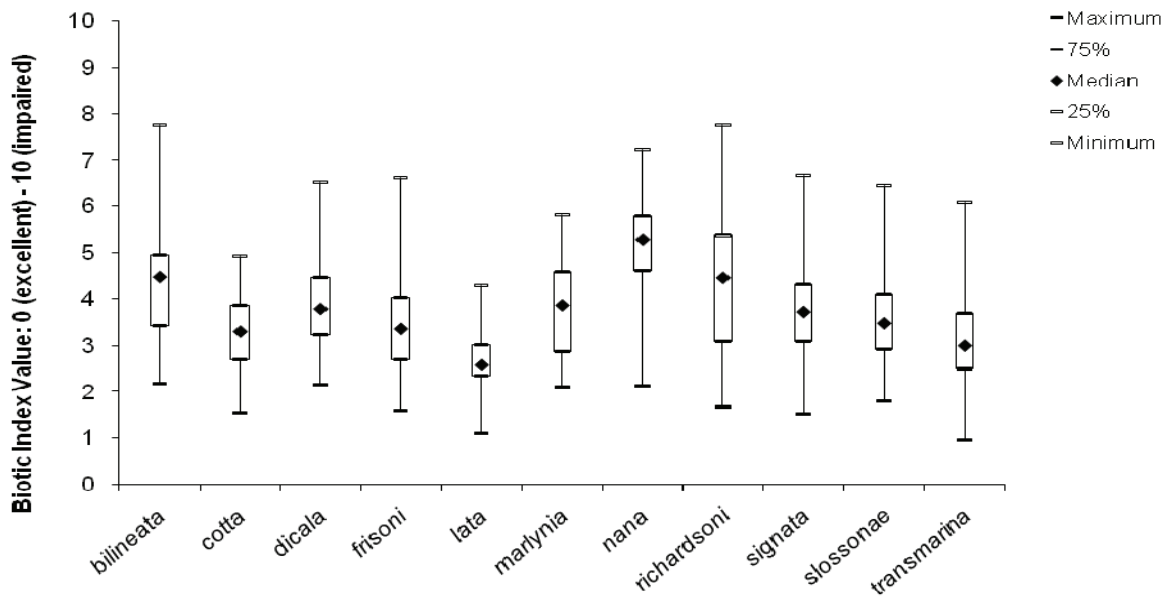
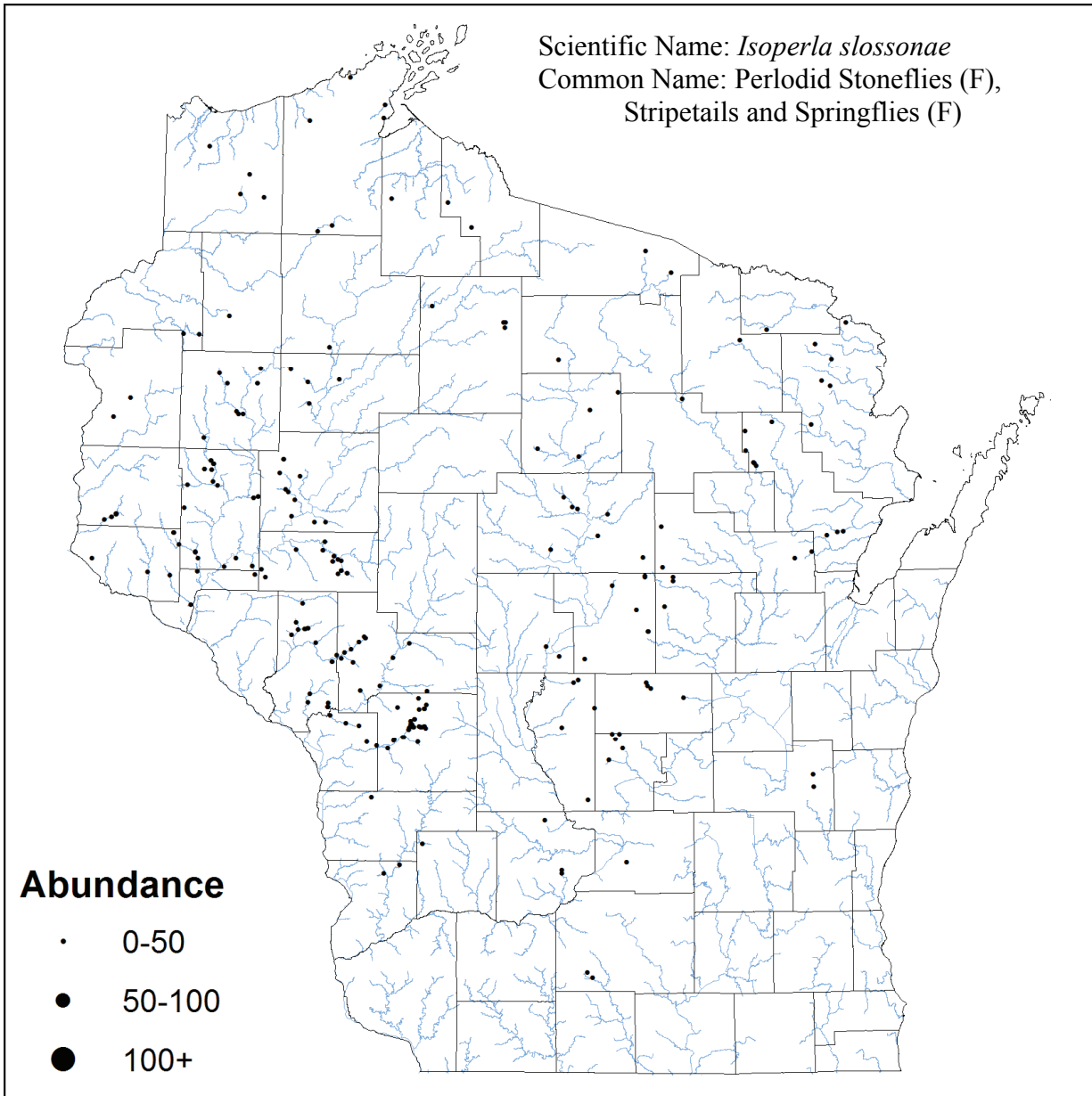
# Plecoptera Perlodidae



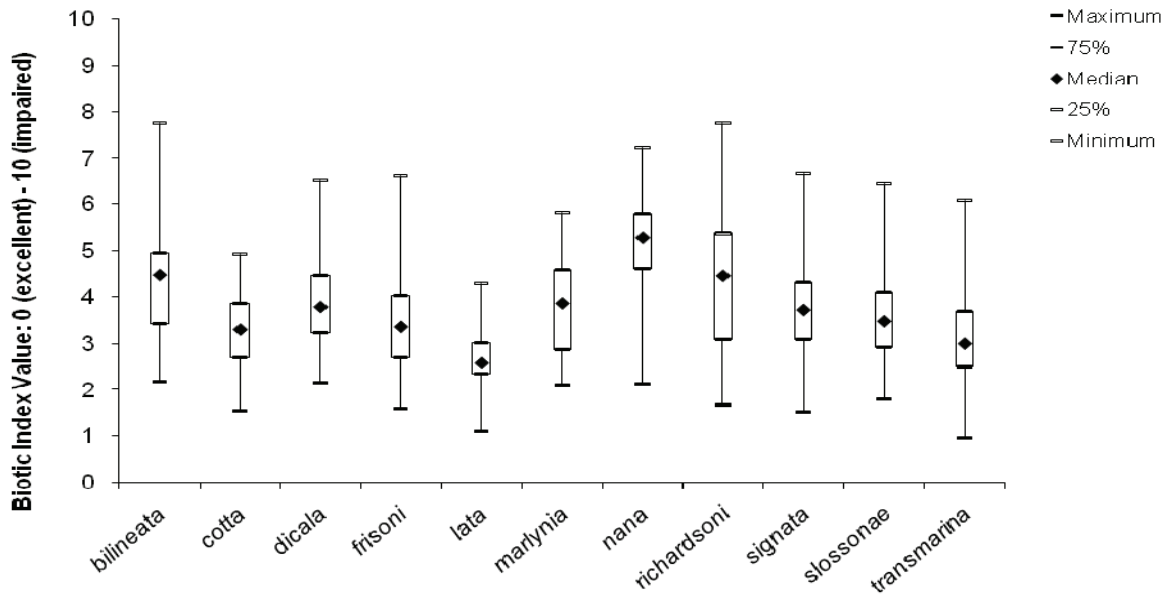
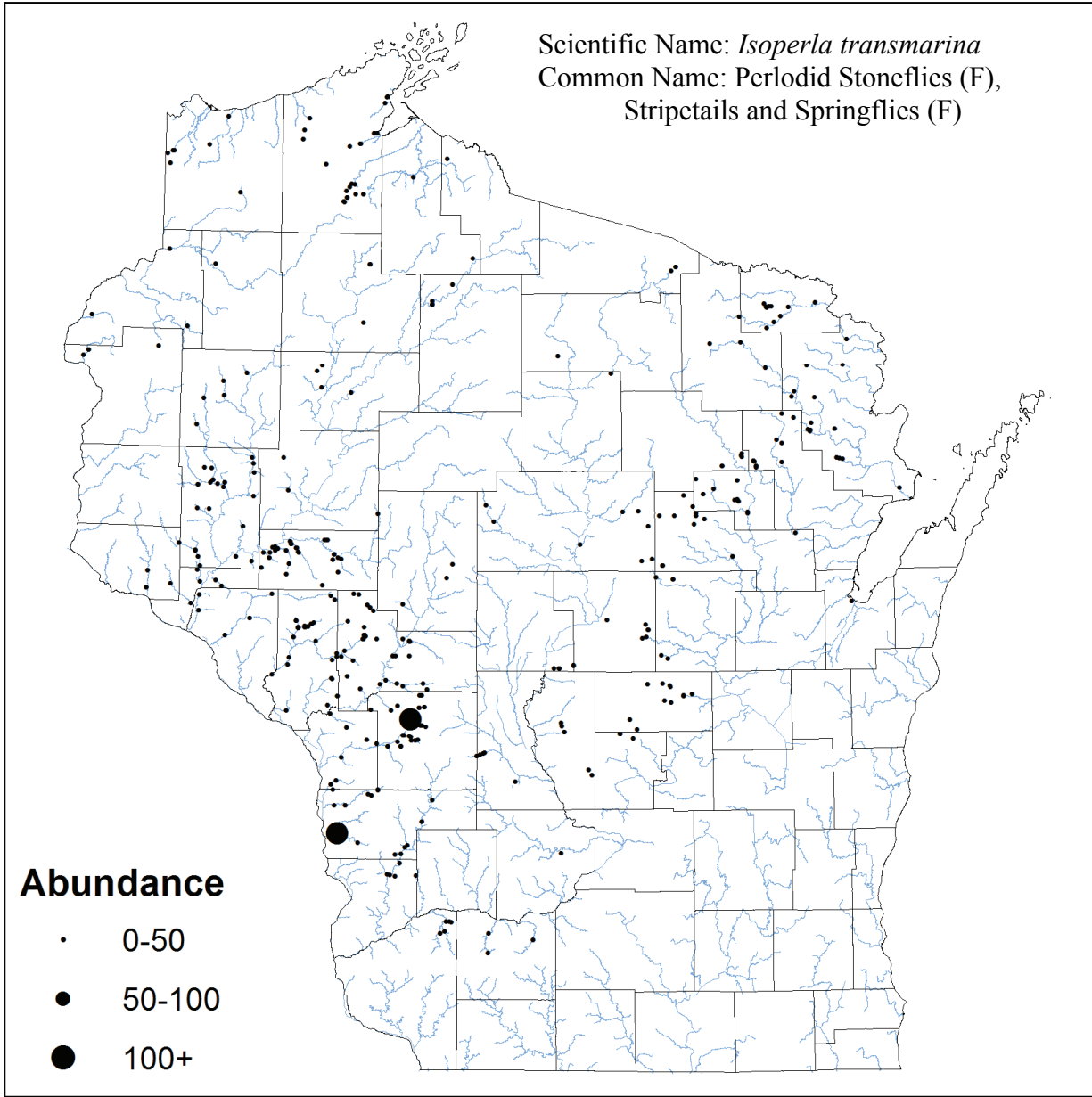
# Plecoptera Perlodidae



# Plecoptera Perlodidae

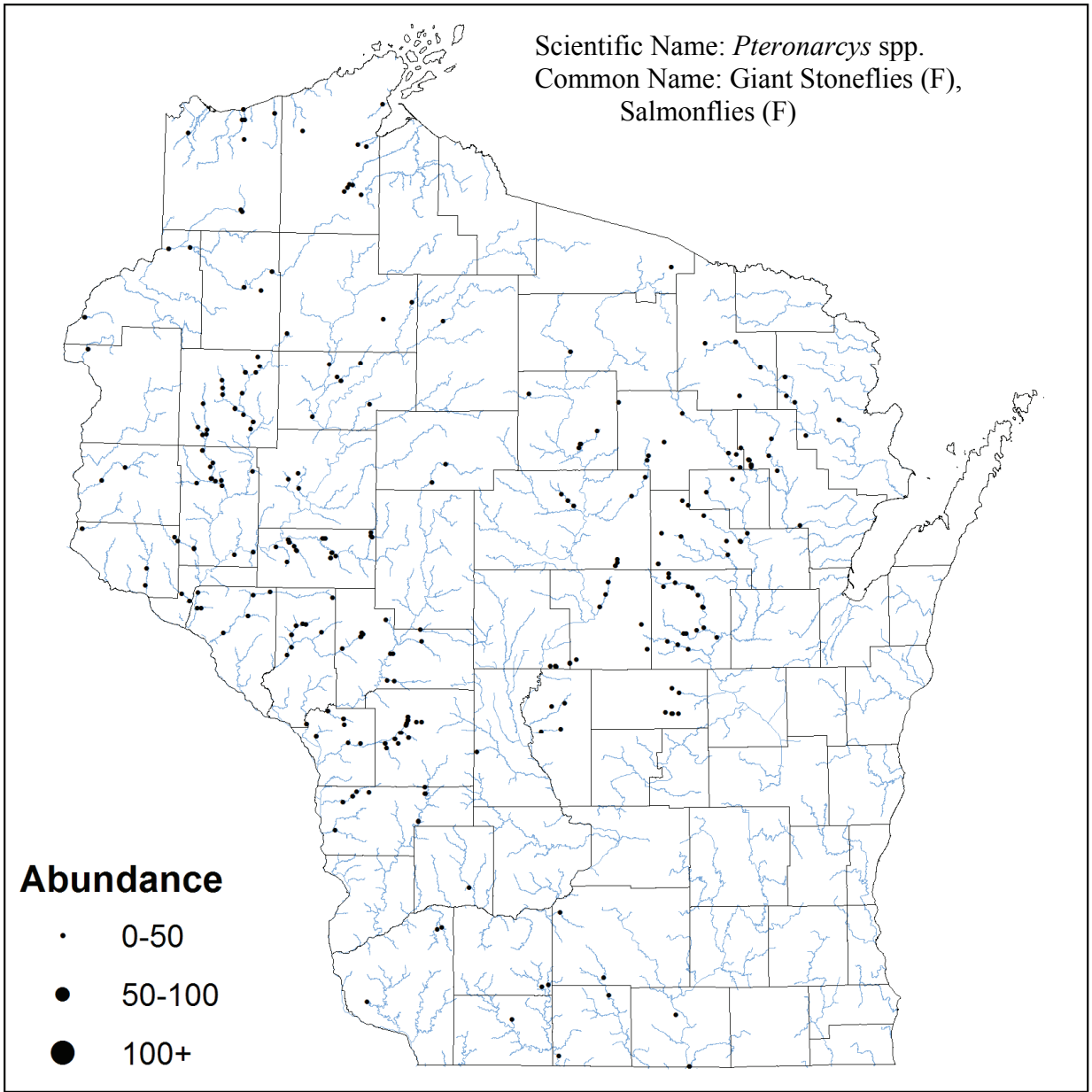


# Plecoptera Perlodidae

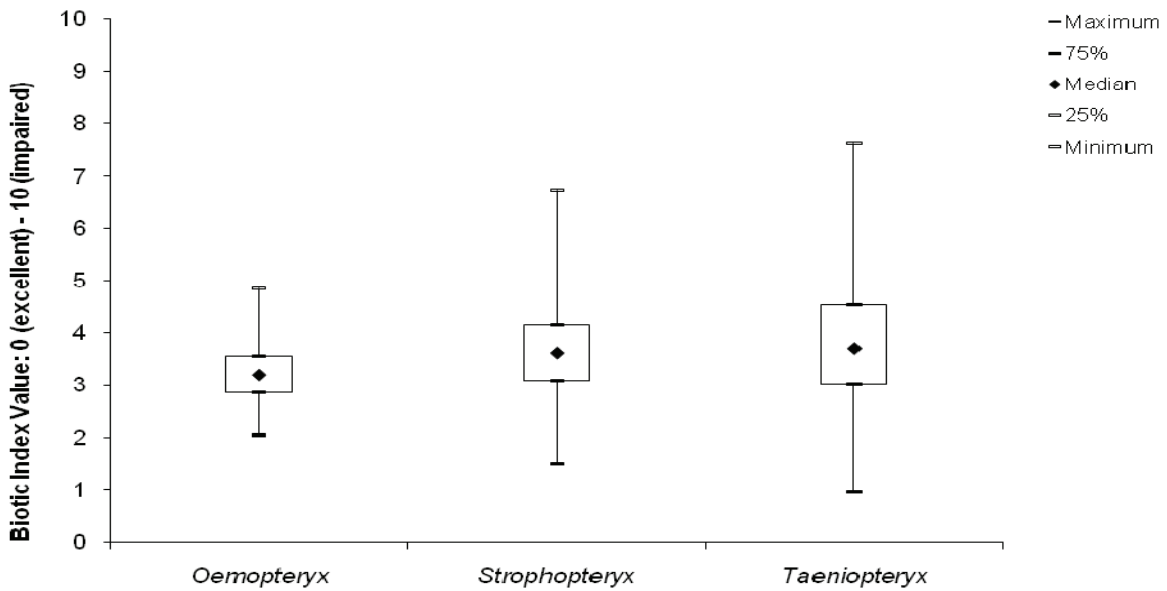
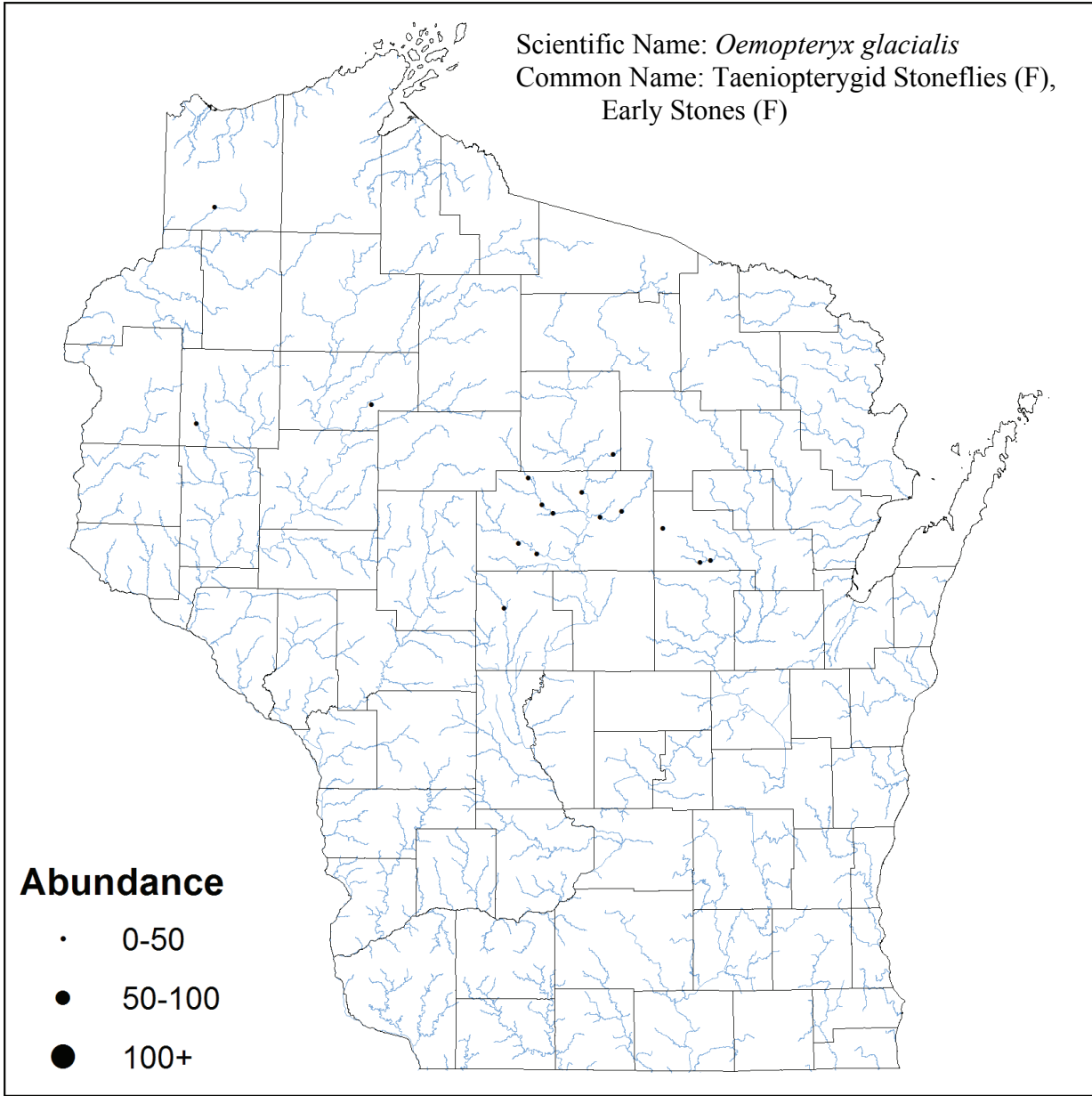




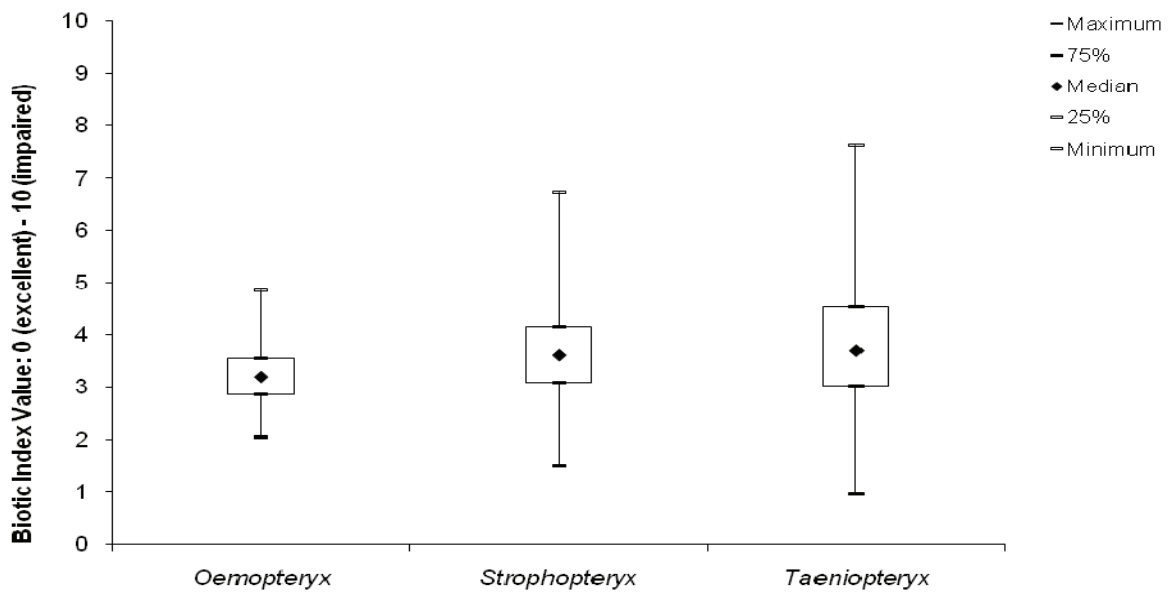
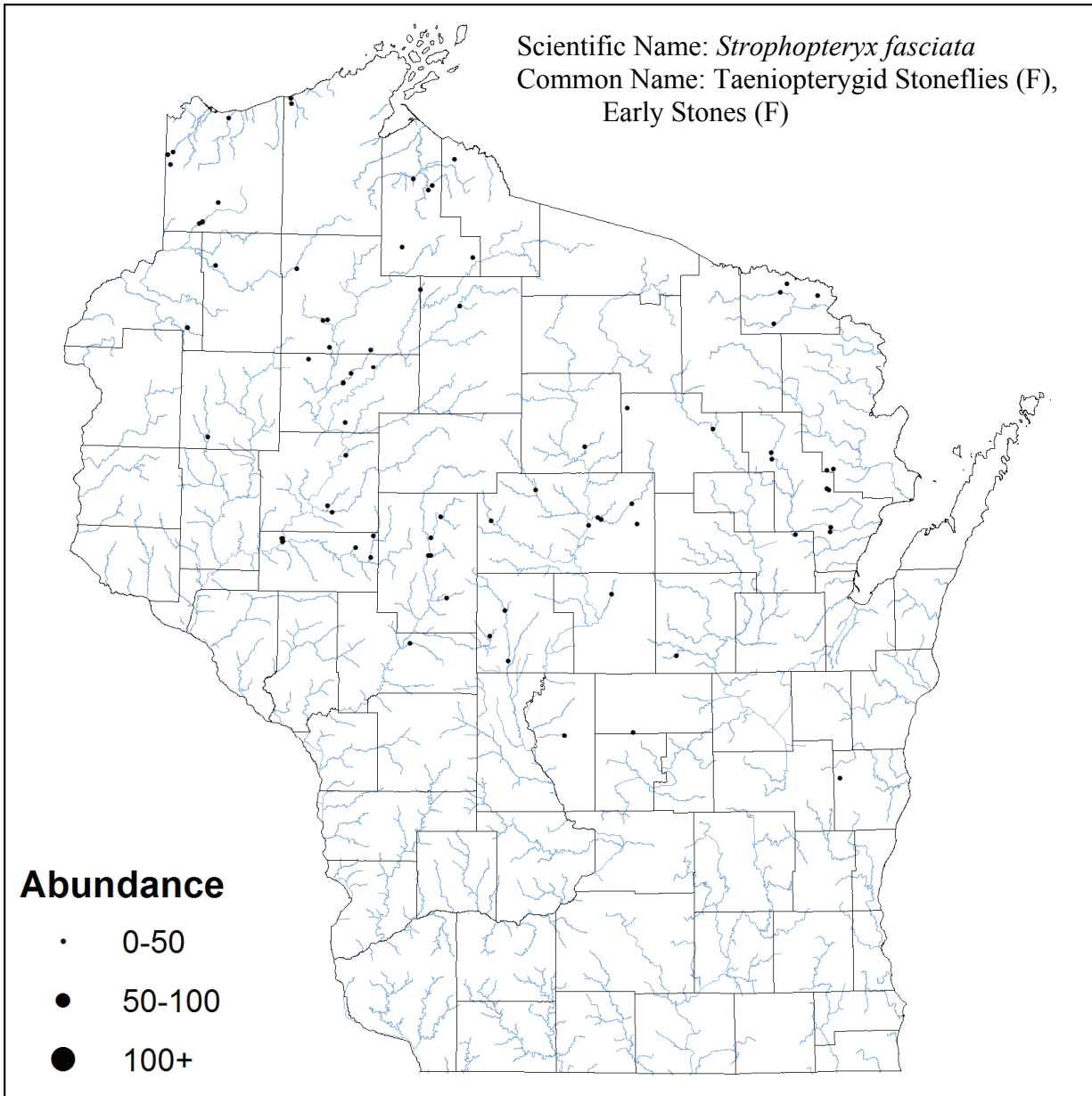
# Plecoptera Pteronarcyidae



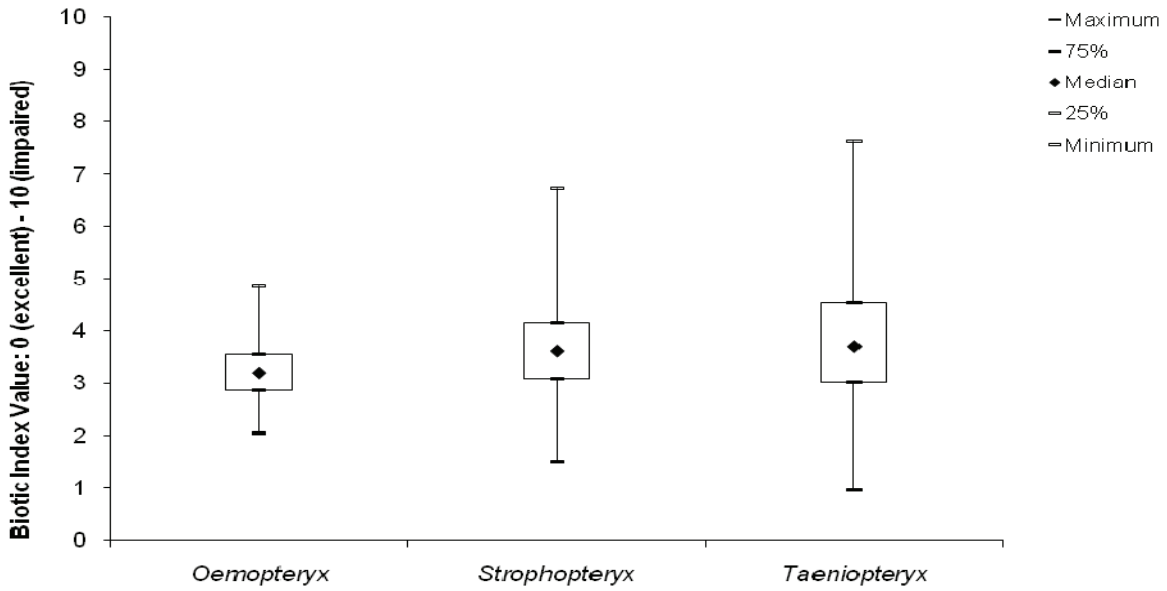
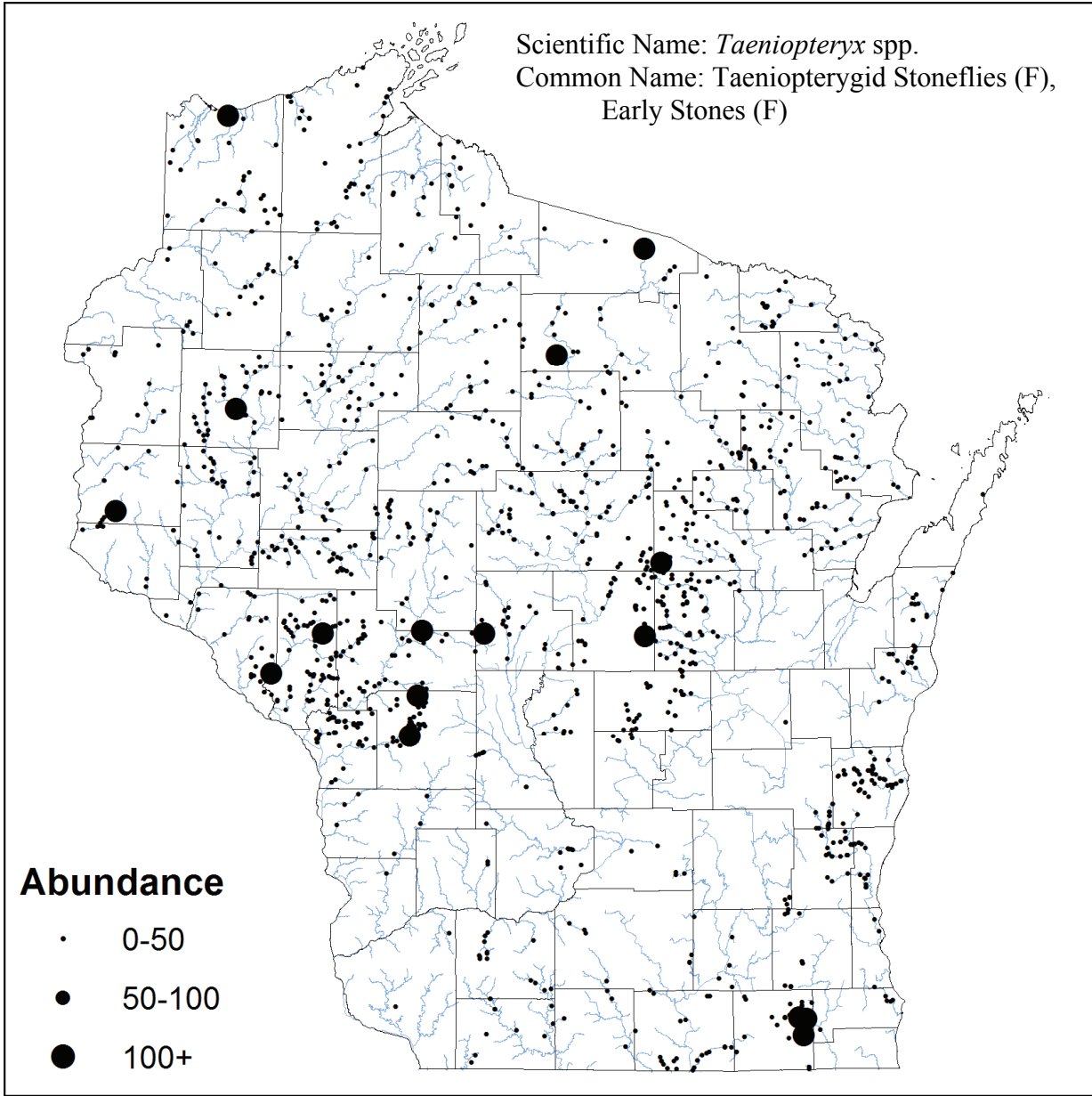
# Plecoptera Taeniopterygidae



# Plecoptera Taeniopterygidae



# Plecoptera Taeniopterygidae



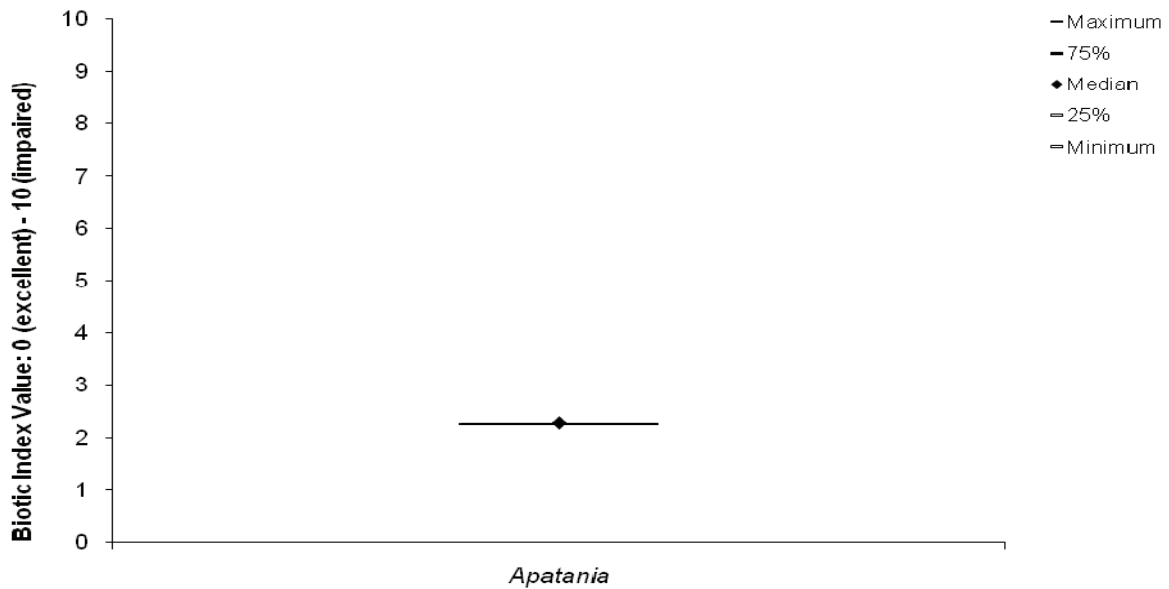
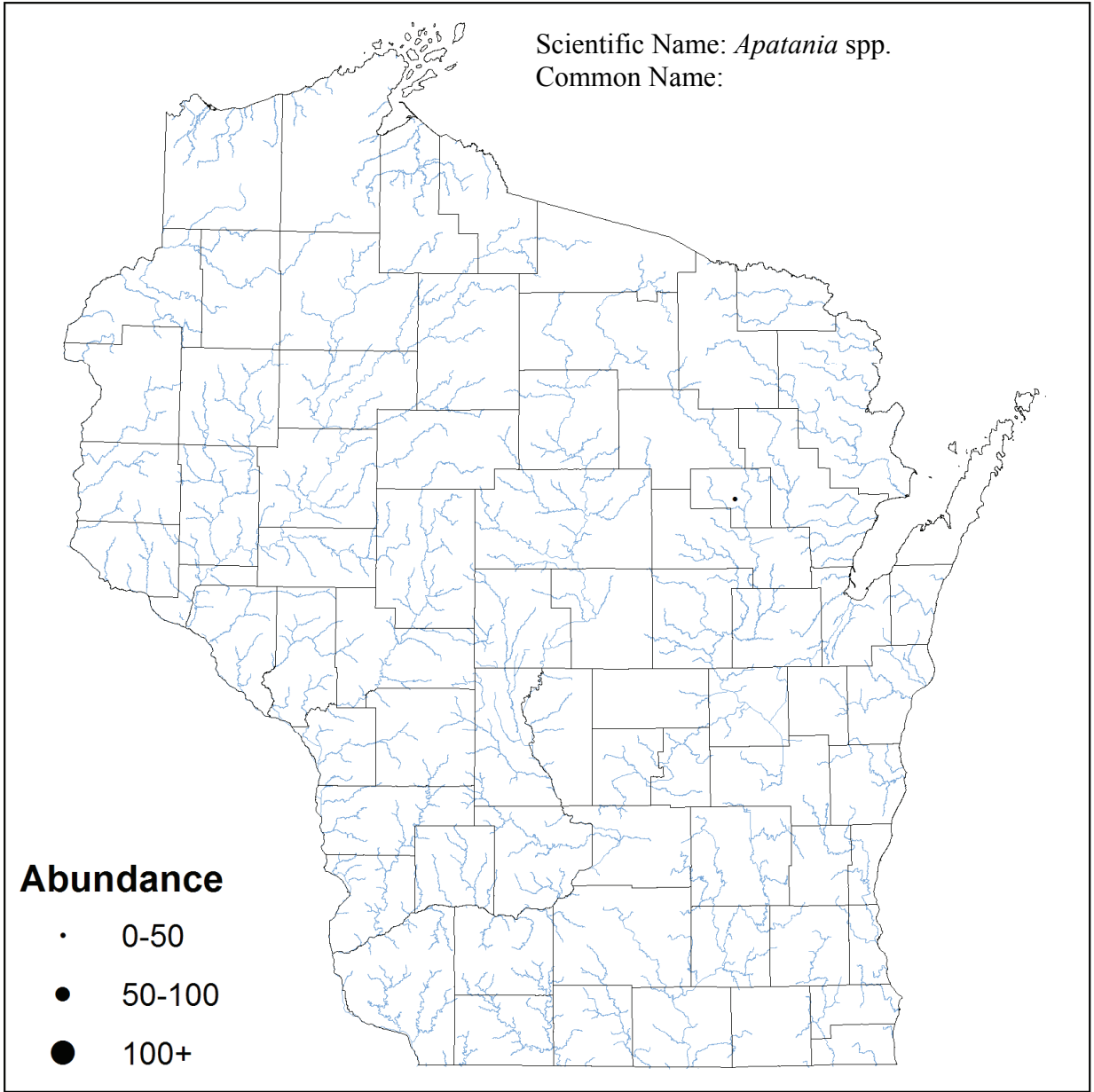
## Section III: Trichoptera (Caddisflies)

# Trichoptera Apataniidae

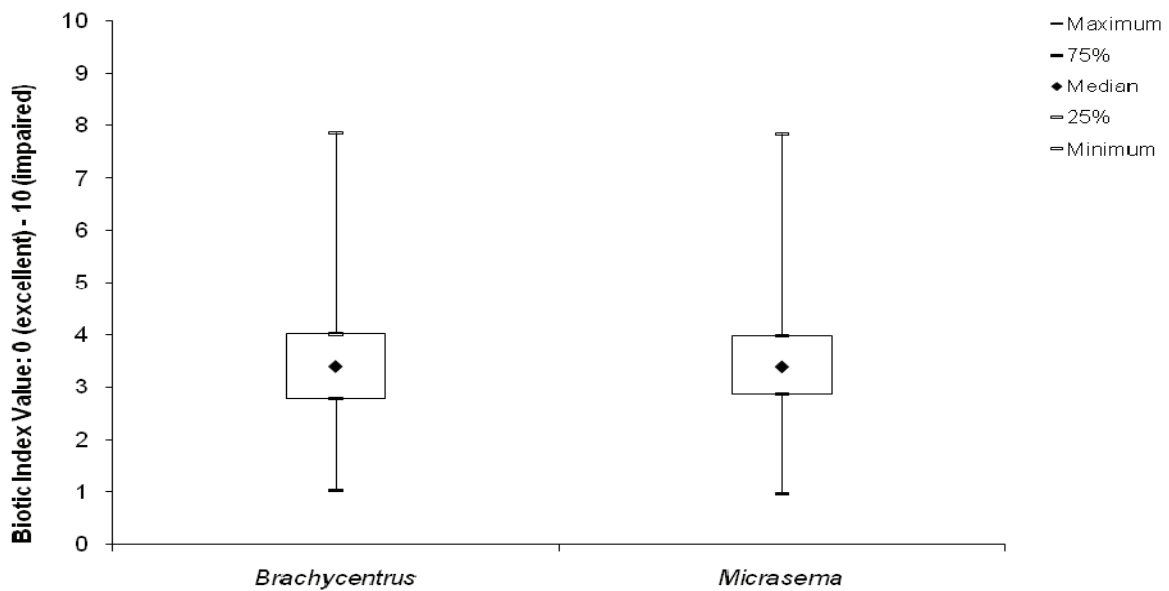
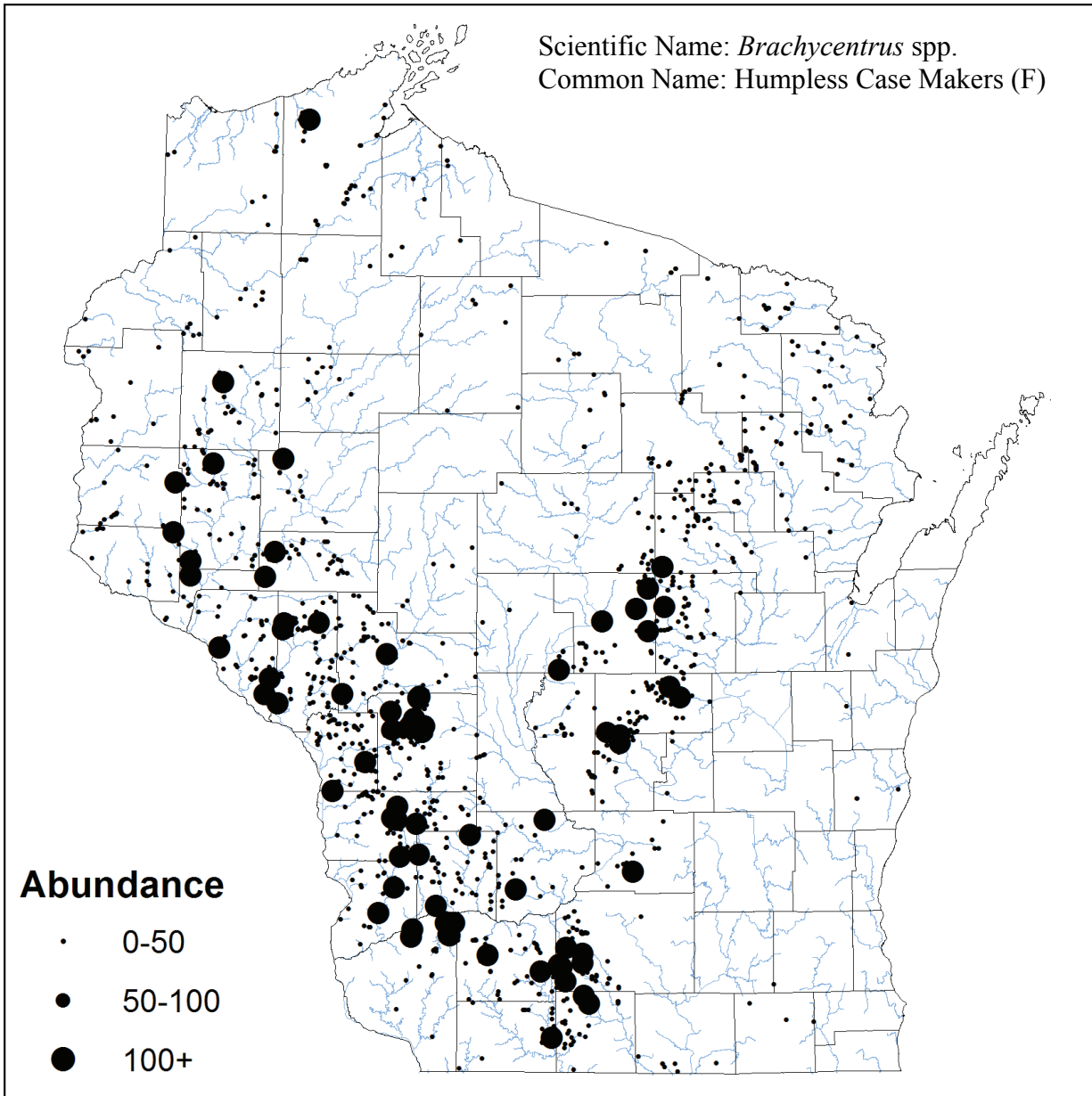
Scientific Name: *Apatania* spp.  
Common Name:

## Abundance

- 0-50
- 50-100
- 100+



# Trichoptera Brachycentridae

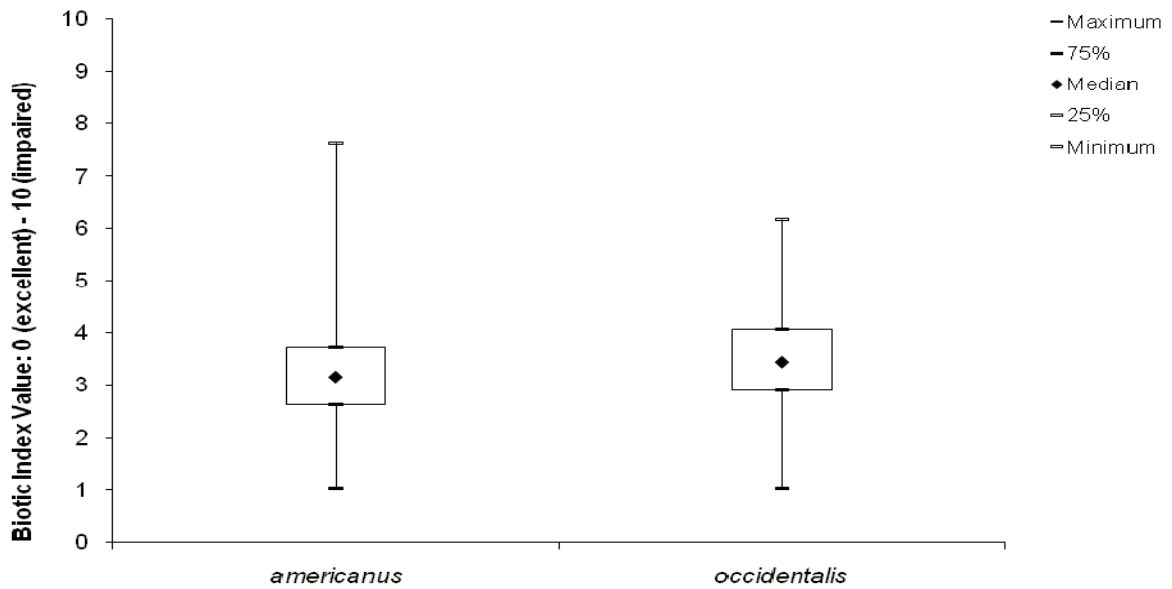
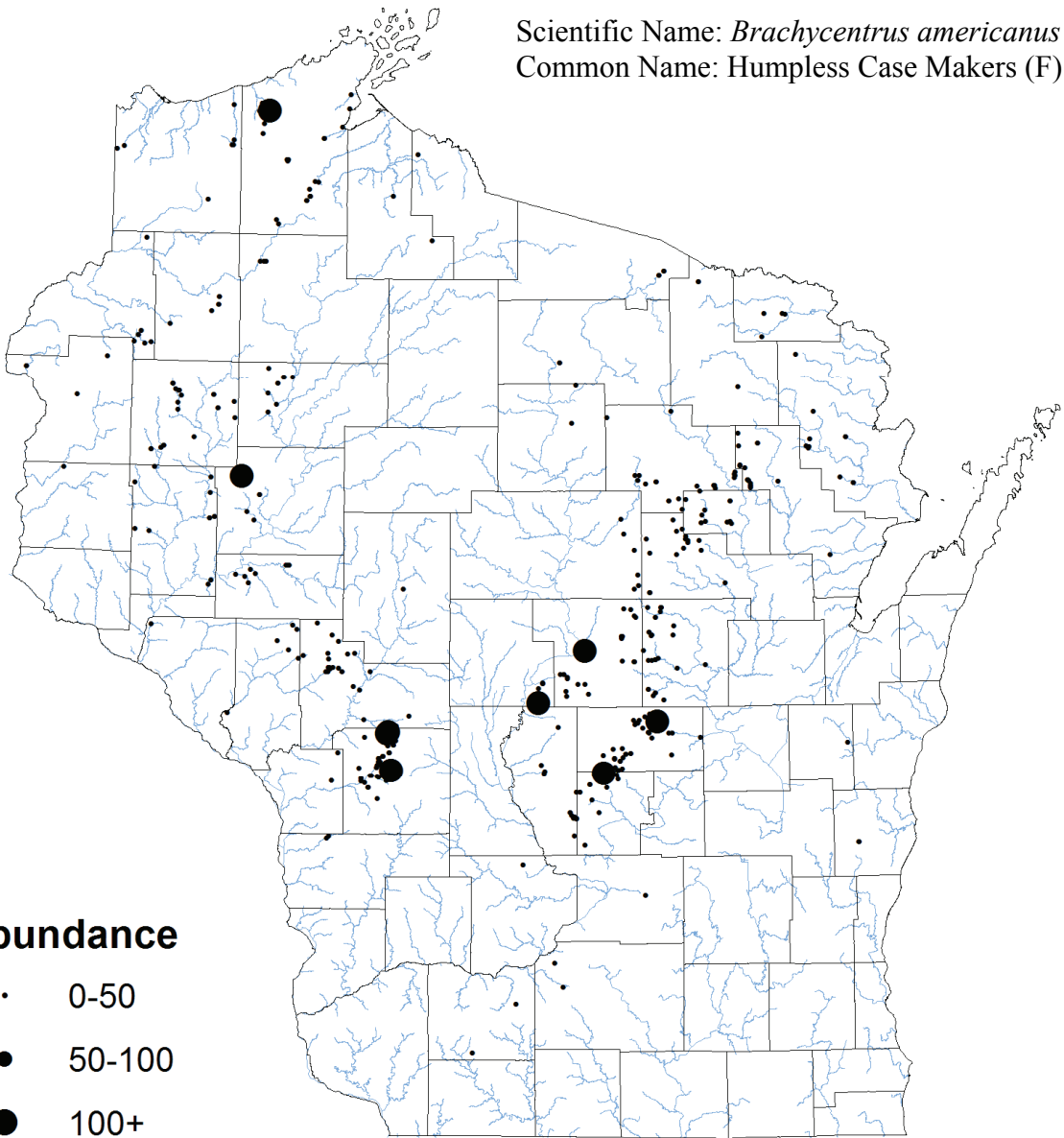


# Trichoptera Brachycentridae

Scientific Name: *Brachycentrus americanus*  
 Common Name: Humplless Case Makers (F)

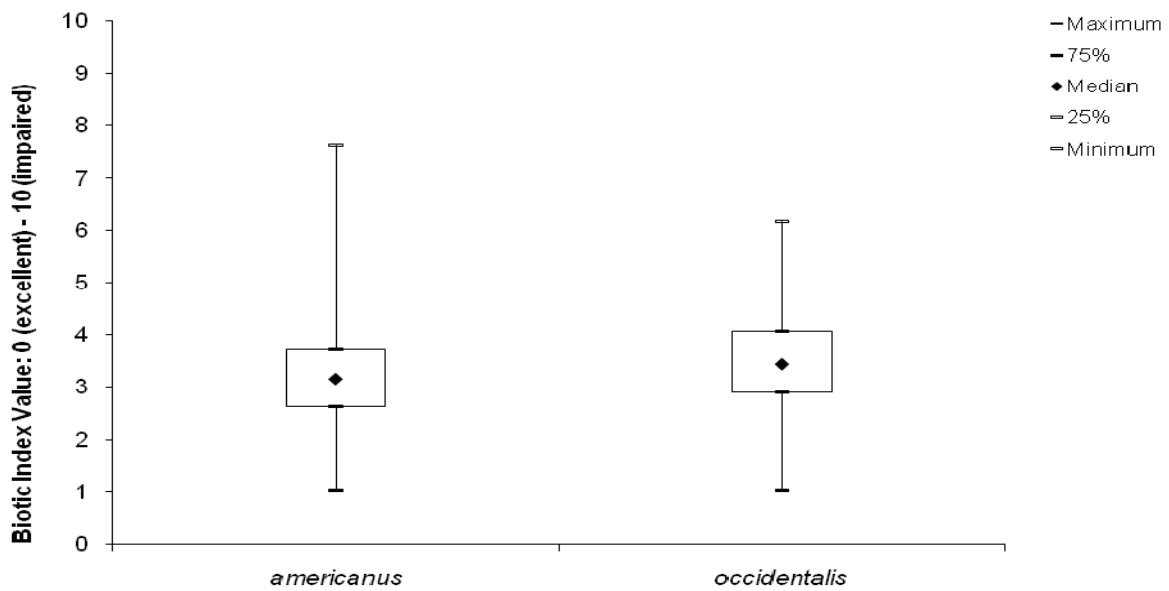
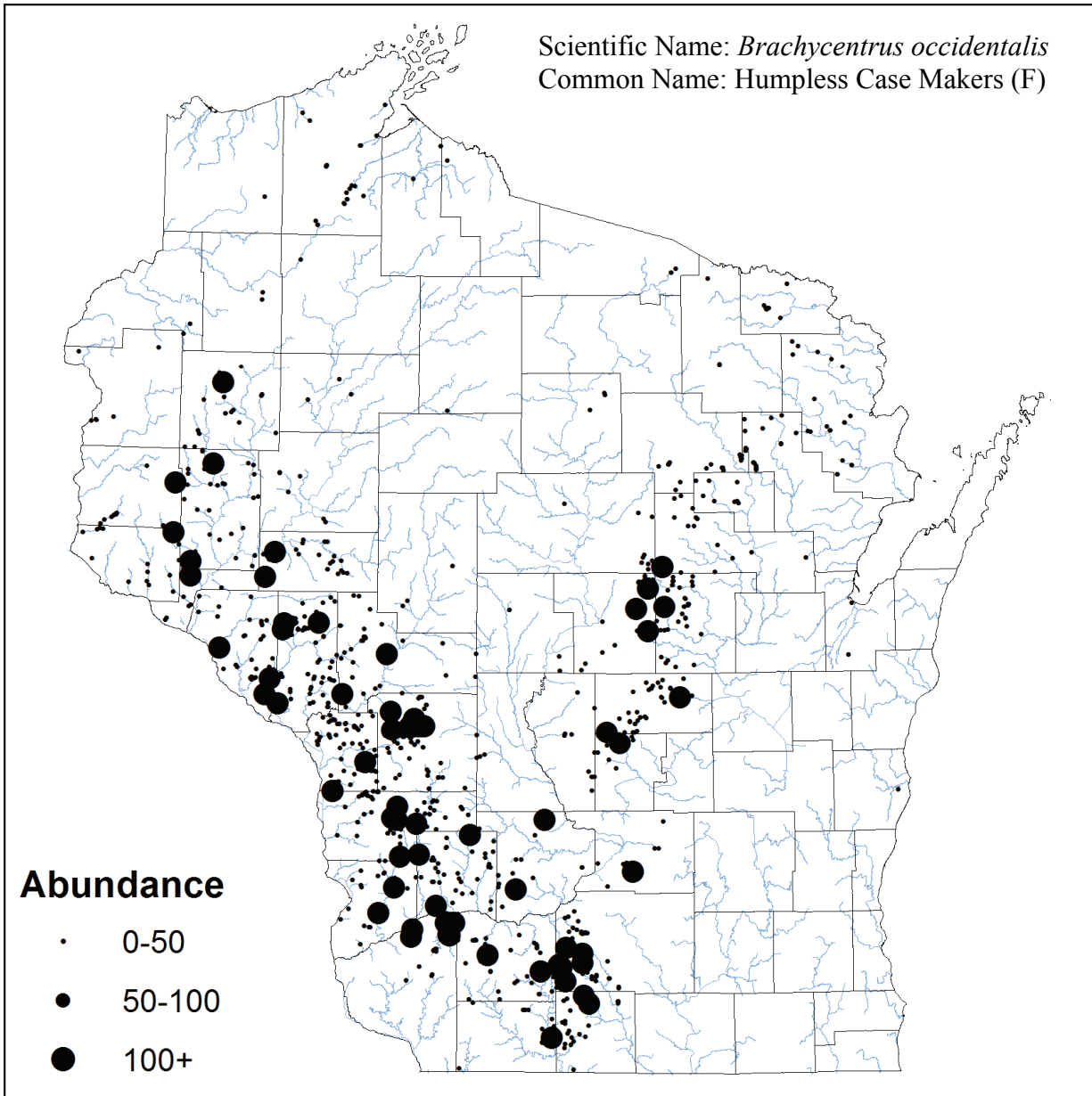
## Abundance

- 0-50
- 50-100
- 100+

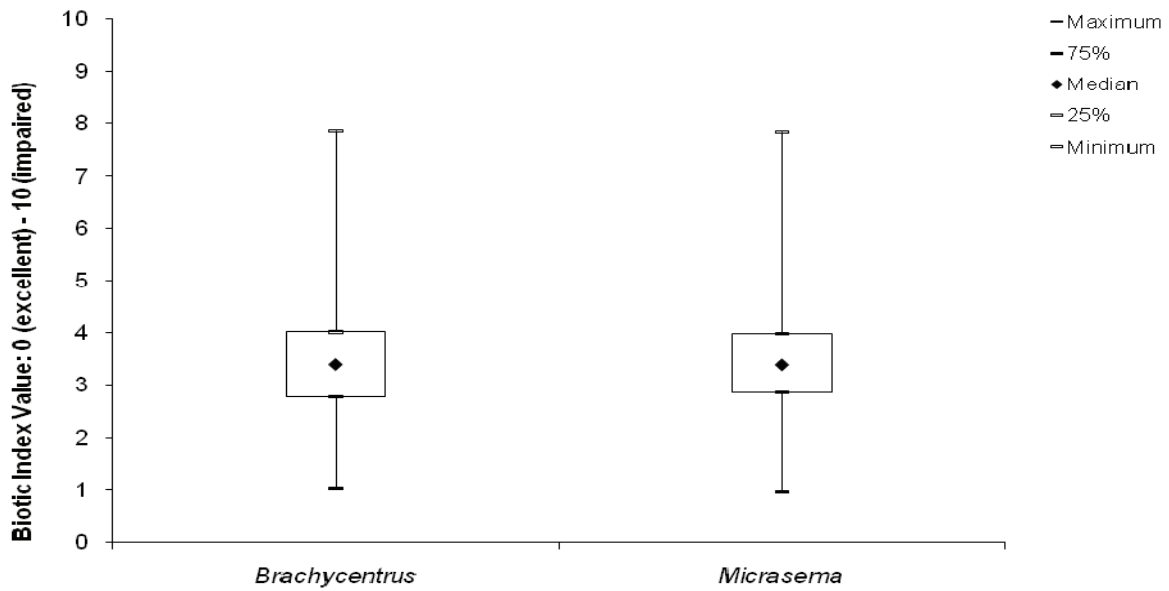
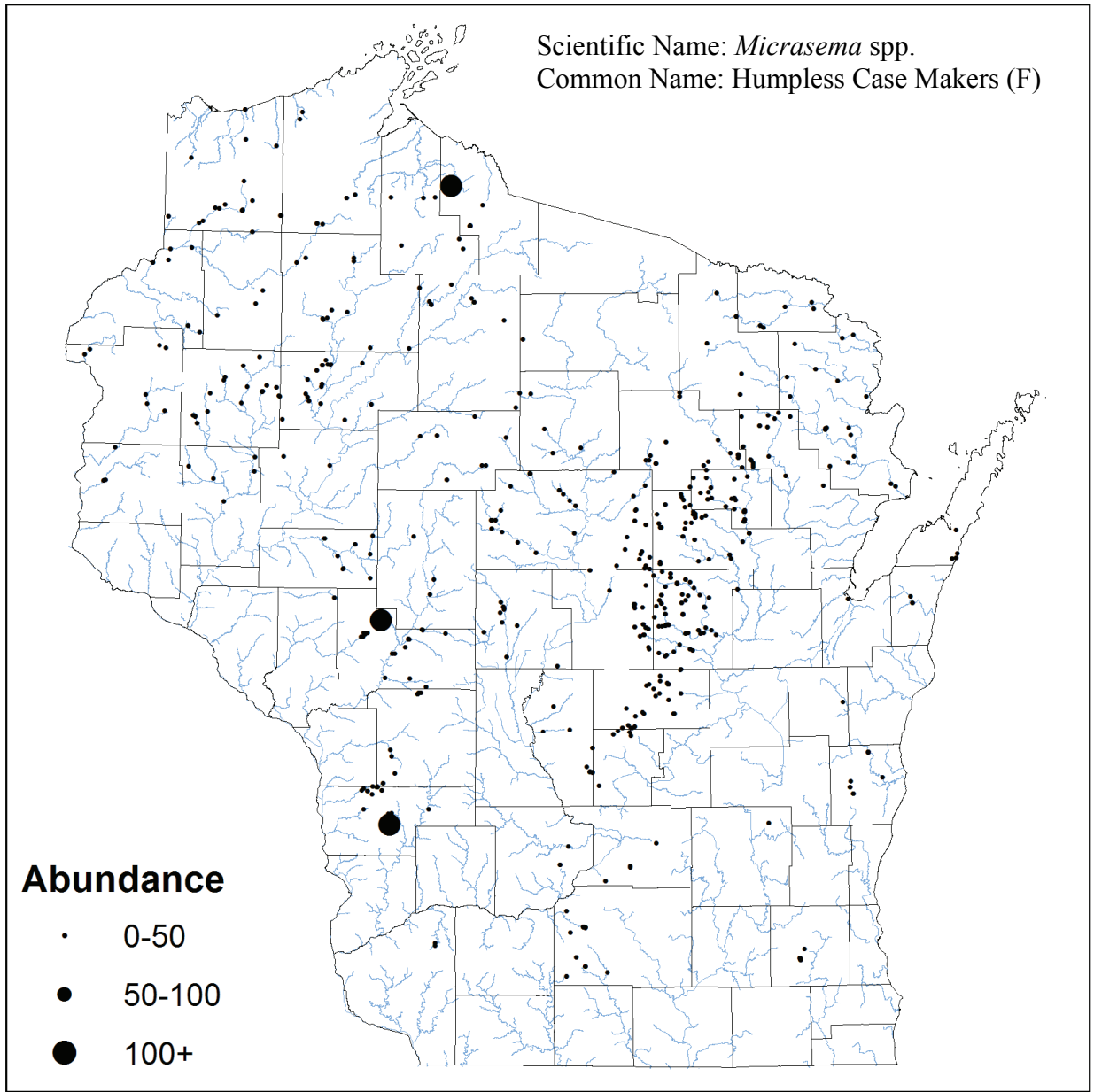




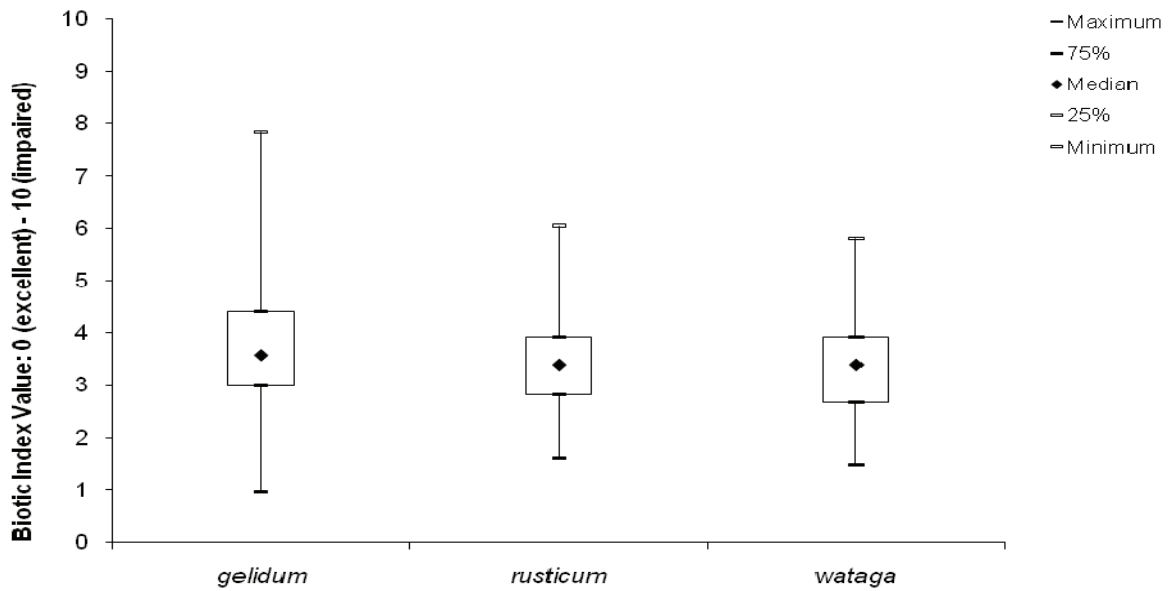
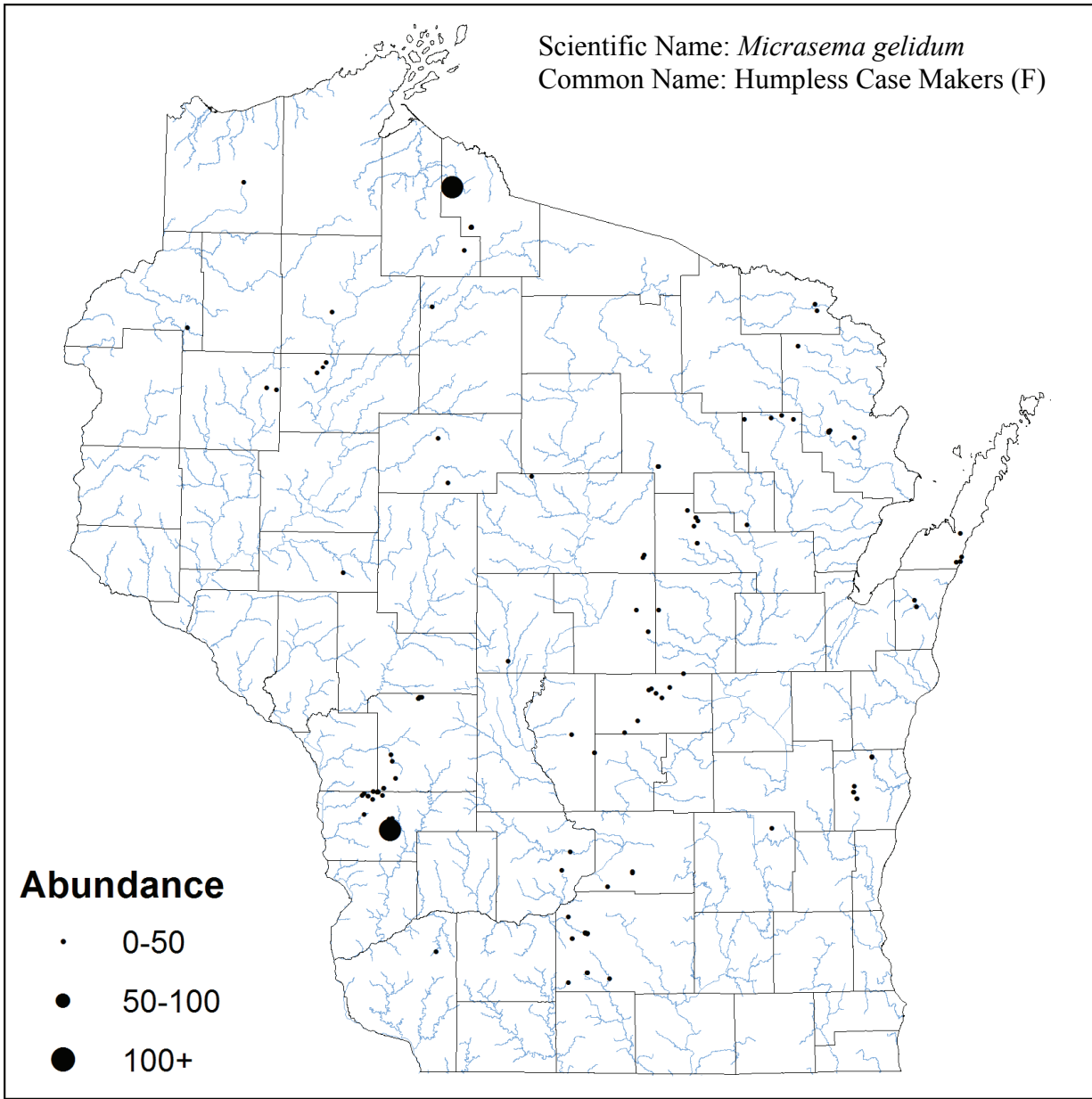
# Trichoptera Brachycentridae



# Trichoptera Brachycentridae



# Trichoptera Brachycentridae

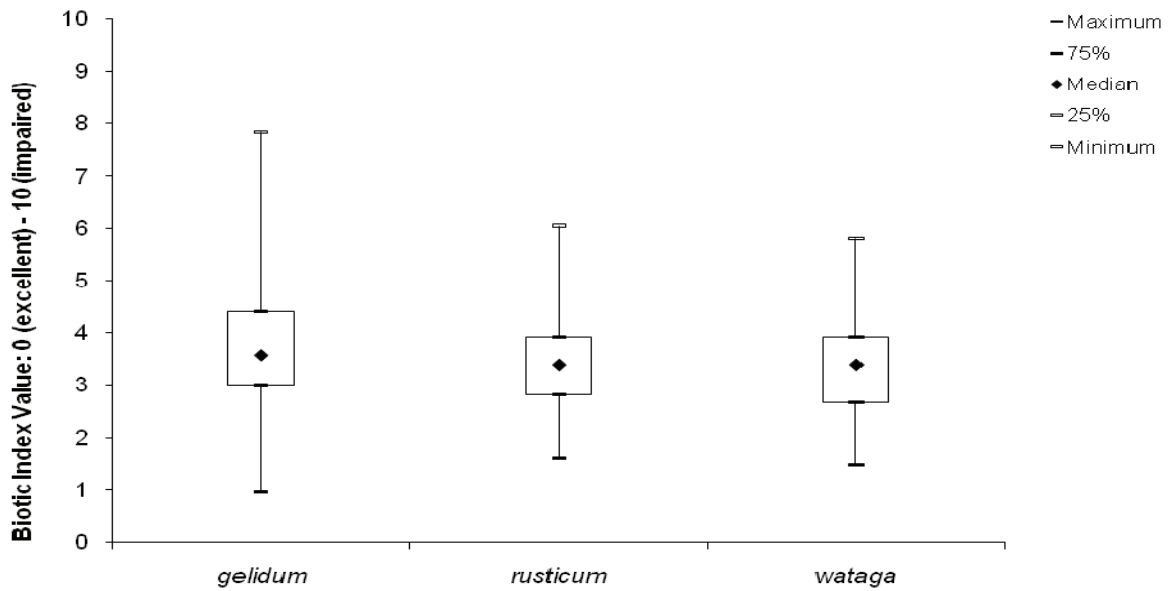
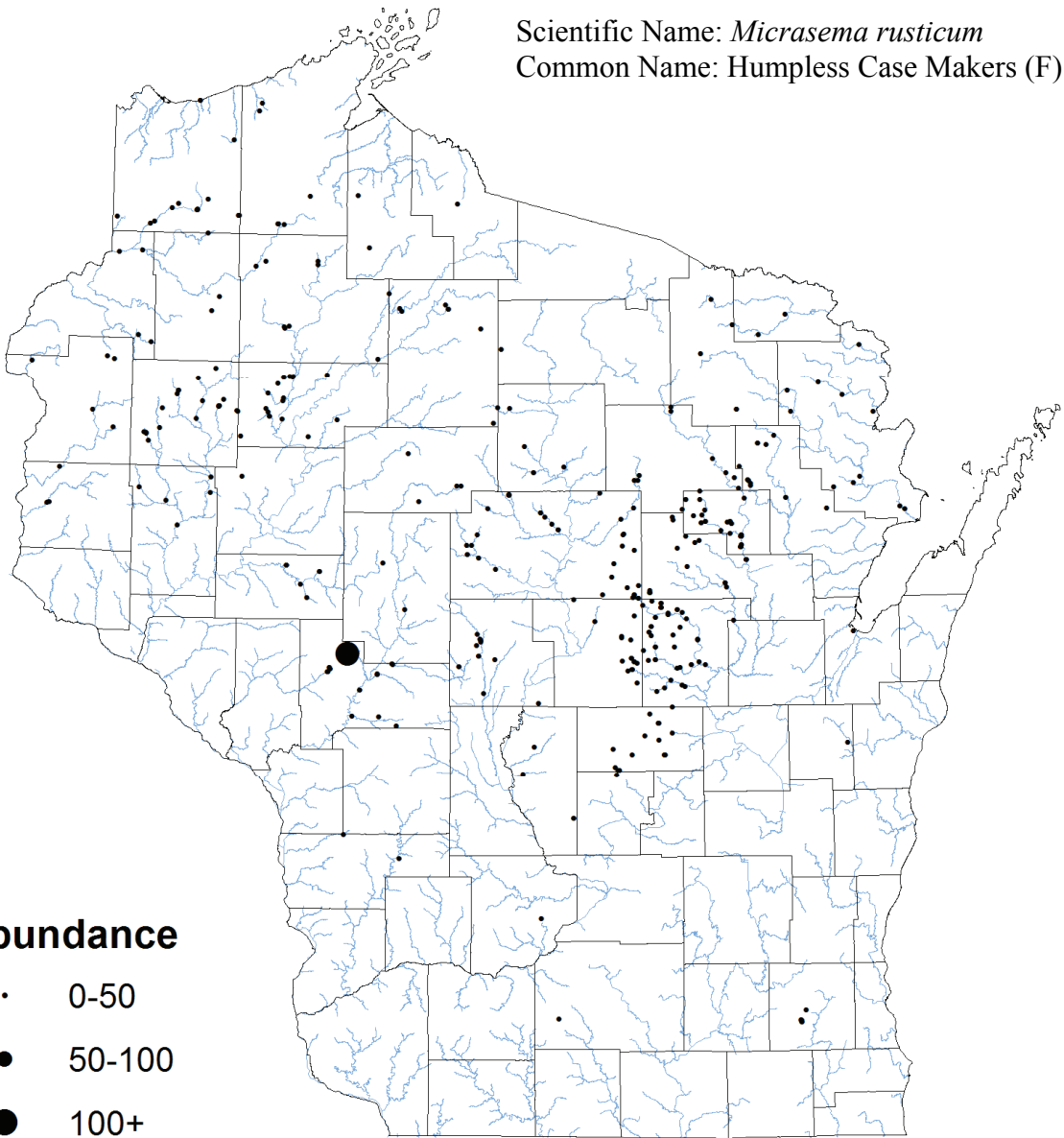


# Trichoptera Brachycentridae

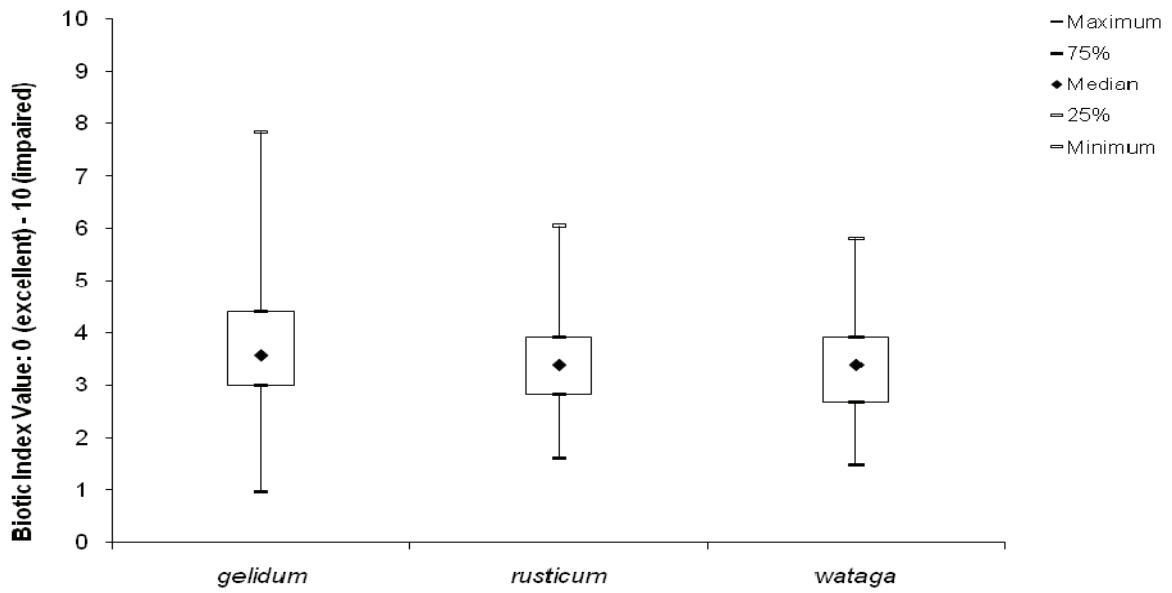
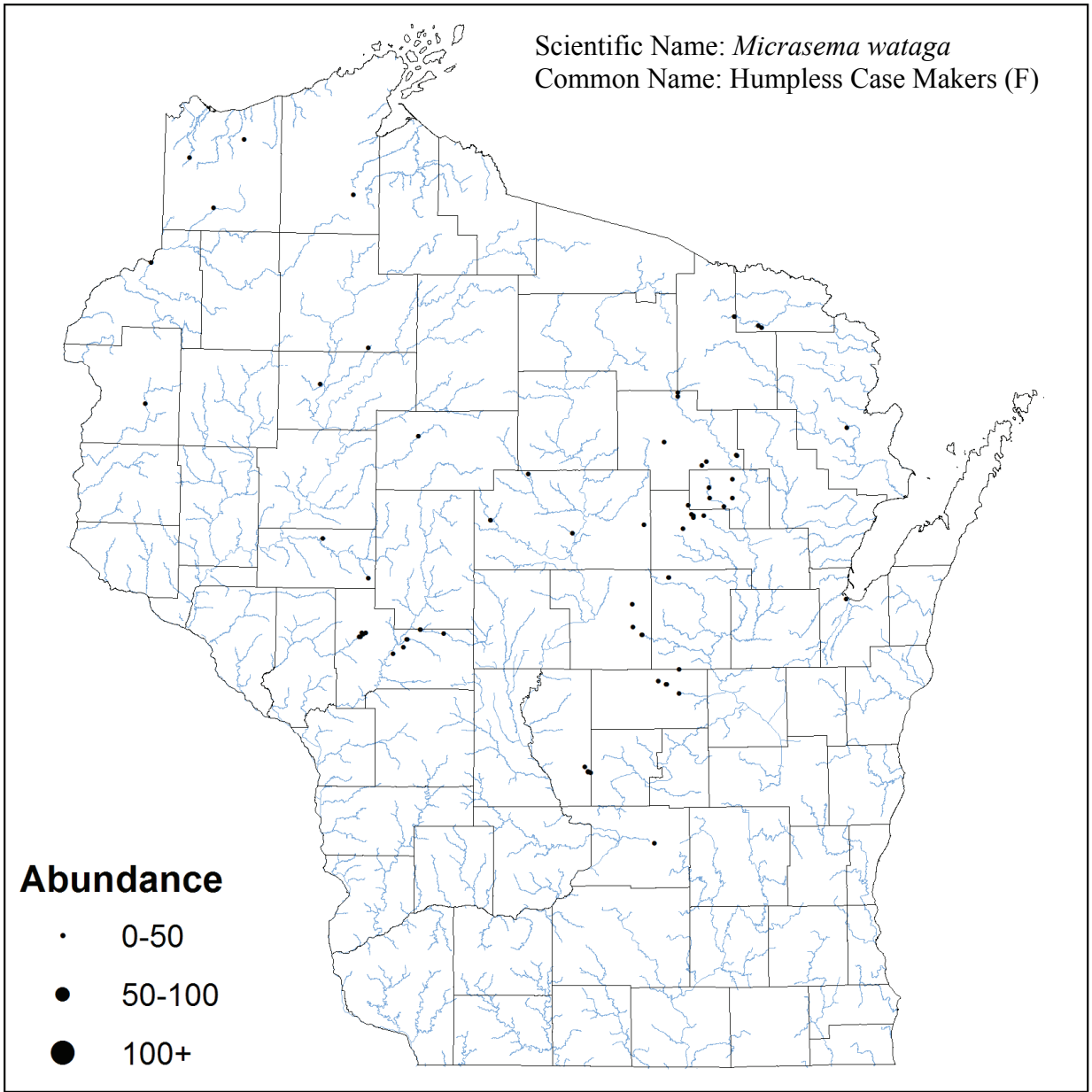
Scientific Name: *Micrasema rusticum*  
 Common Name: Humplless Case Makers (F)

## Abundance

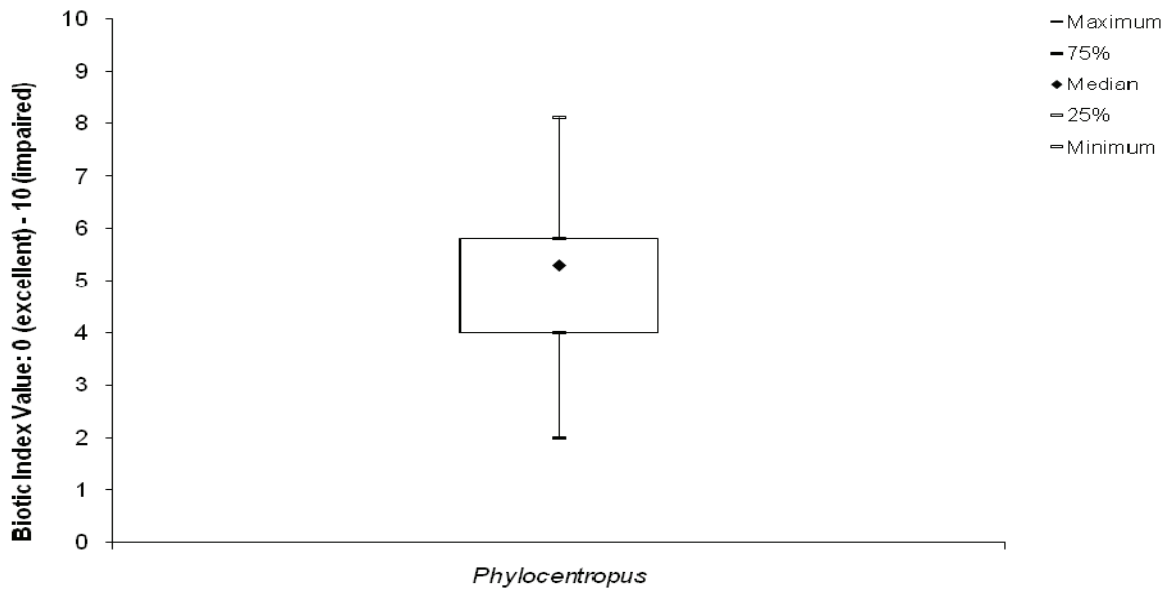
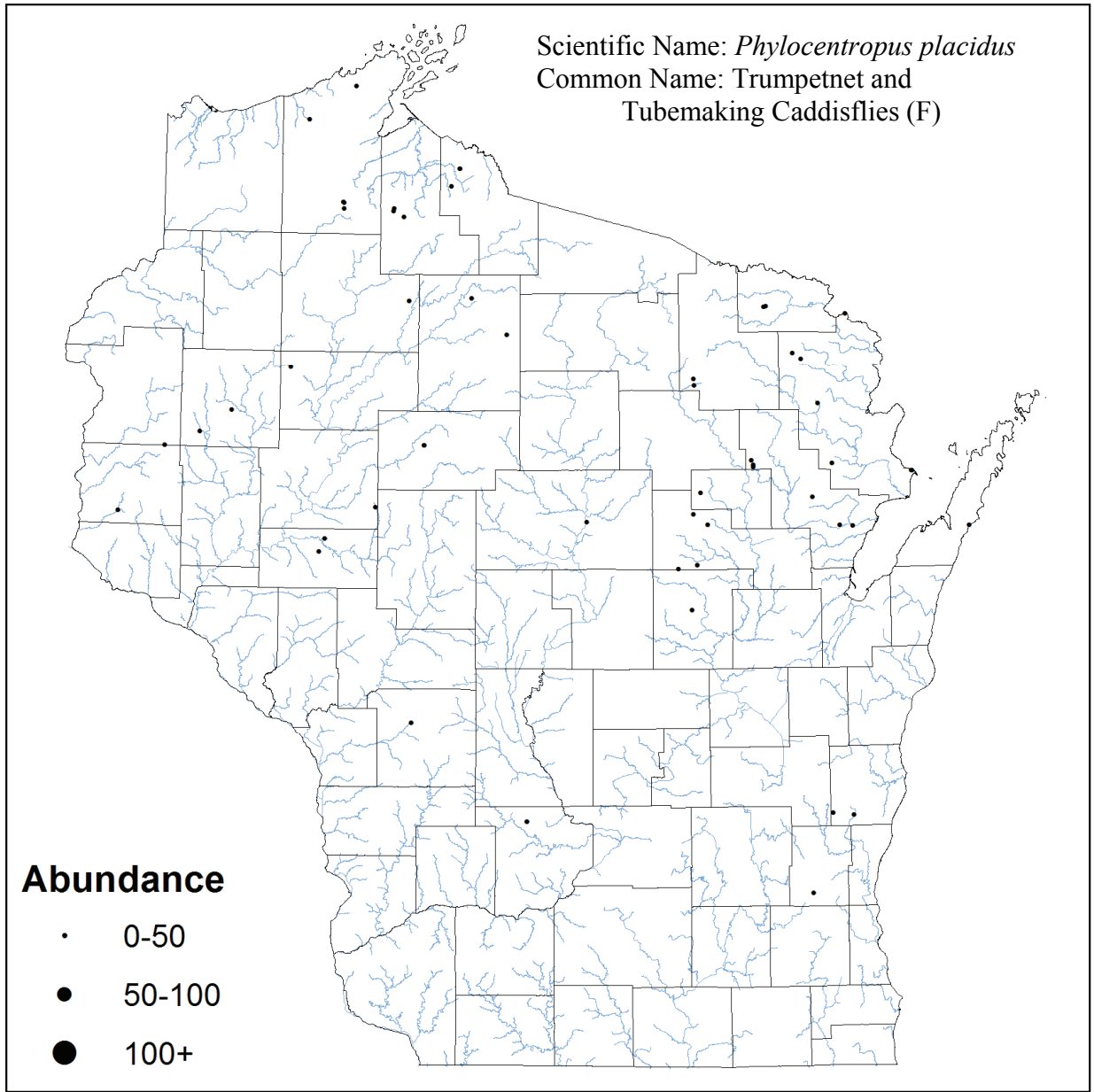
- 0-50
- 50-100
- 100+



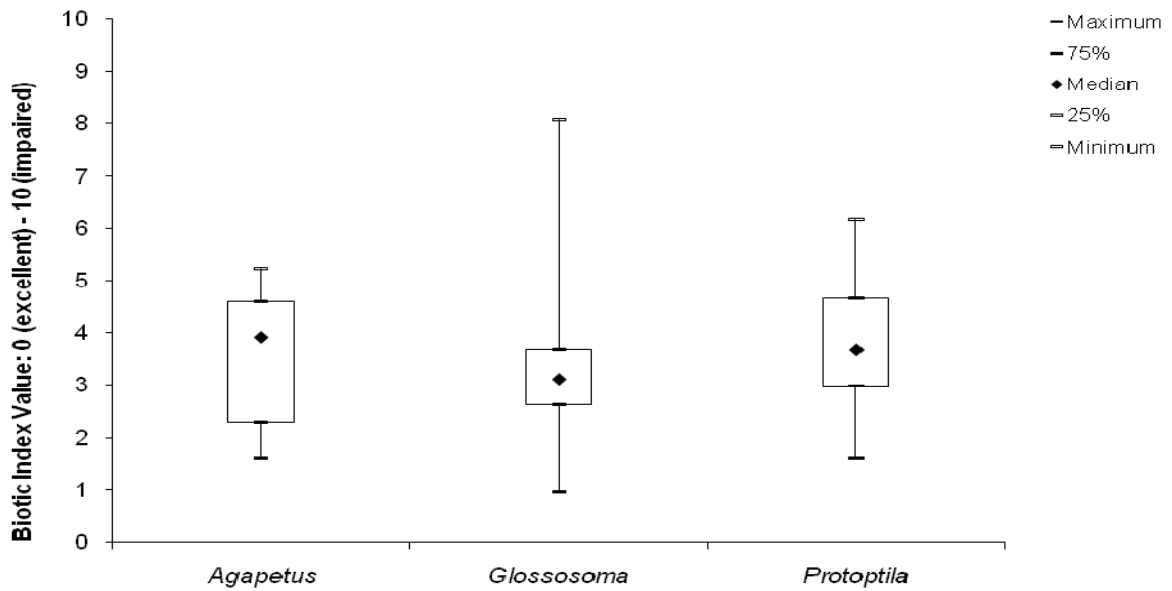
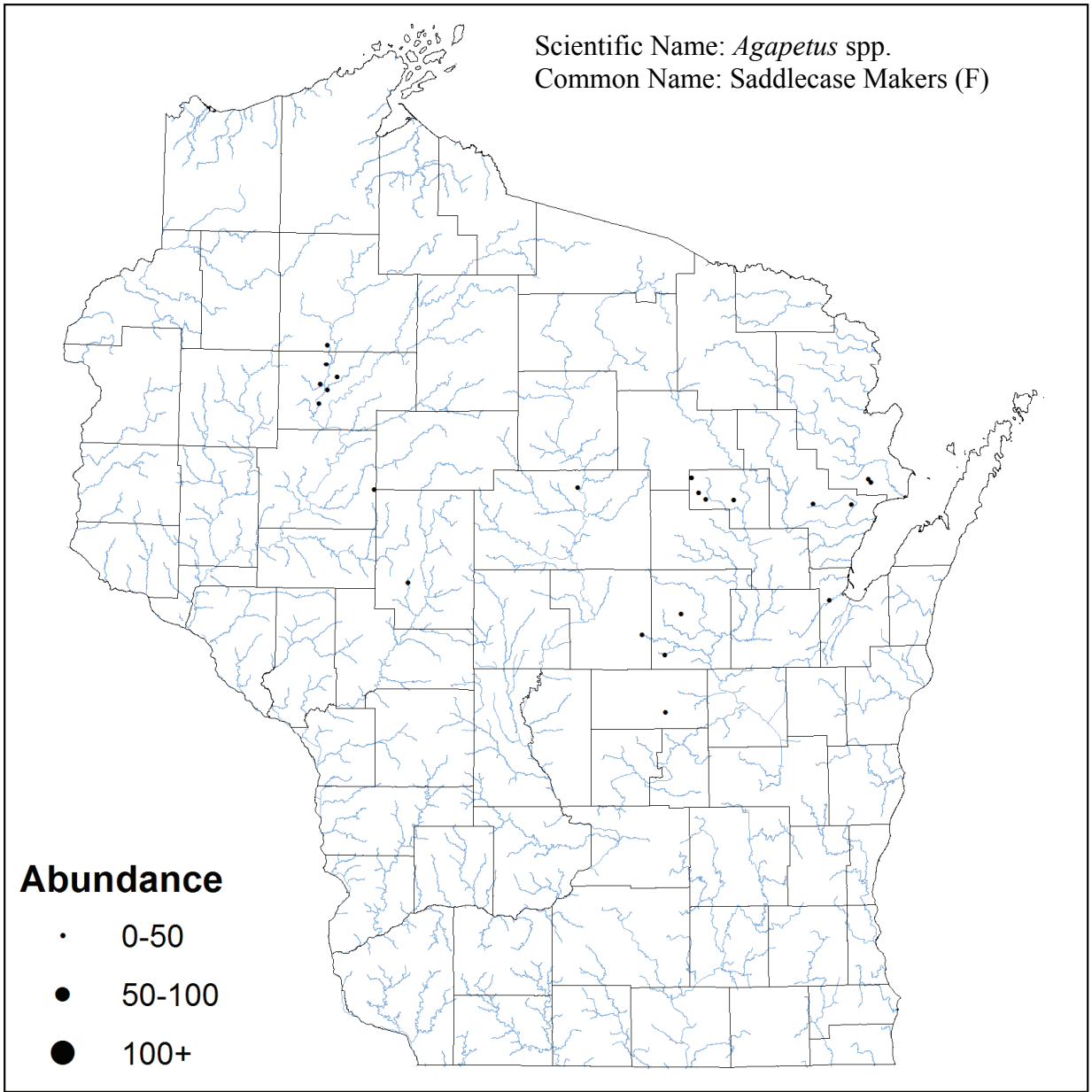
# Trichoptera Brachycentridae



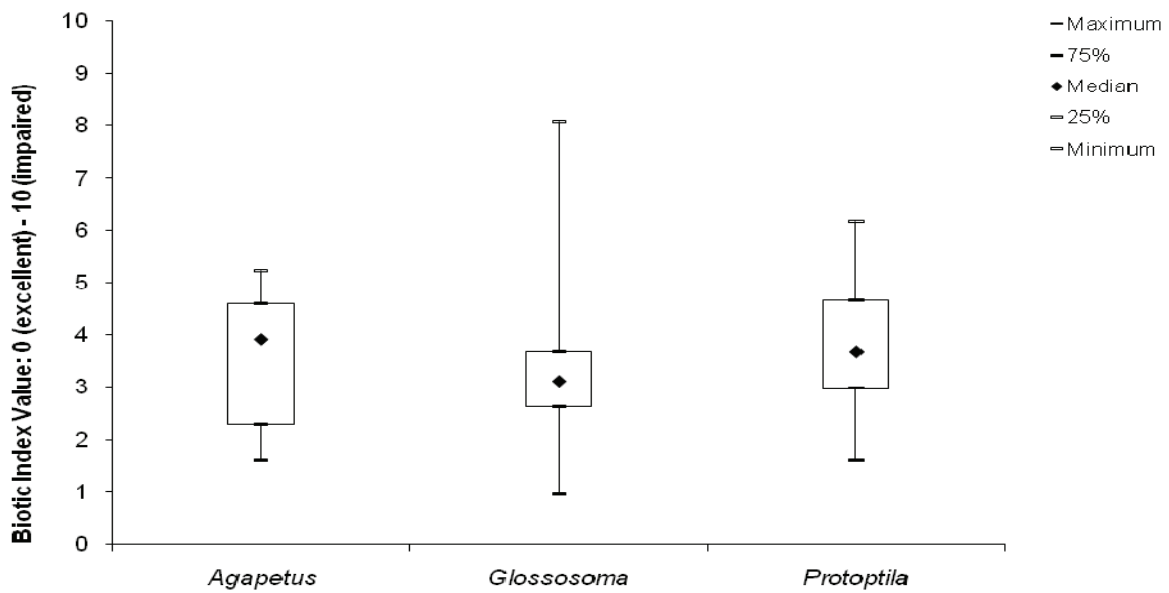
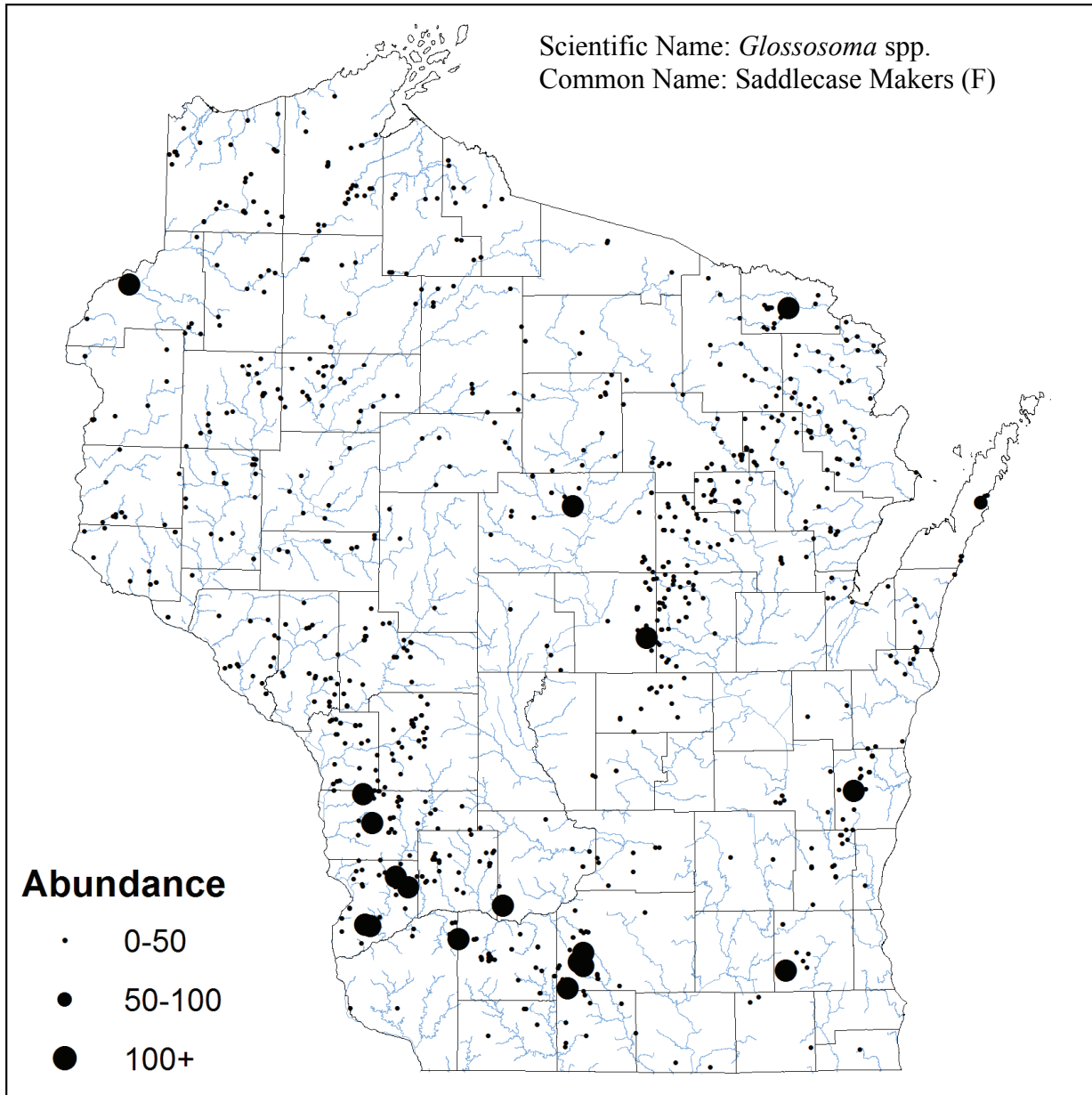
# Trichoptera Dispeudopsidae



# Trichoptera Glossosomatidae

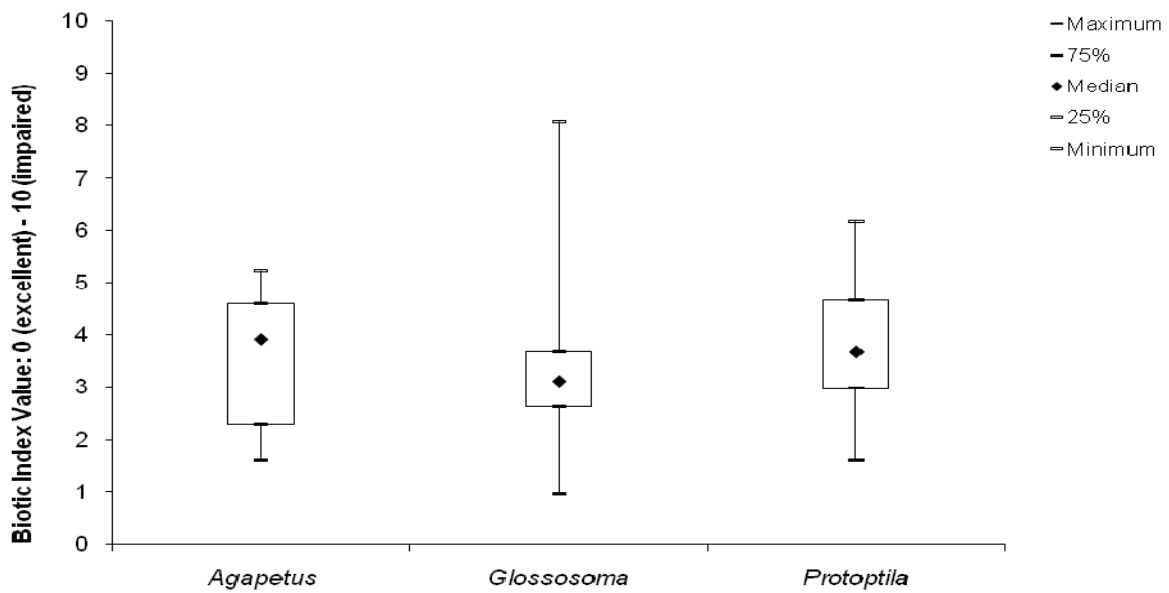
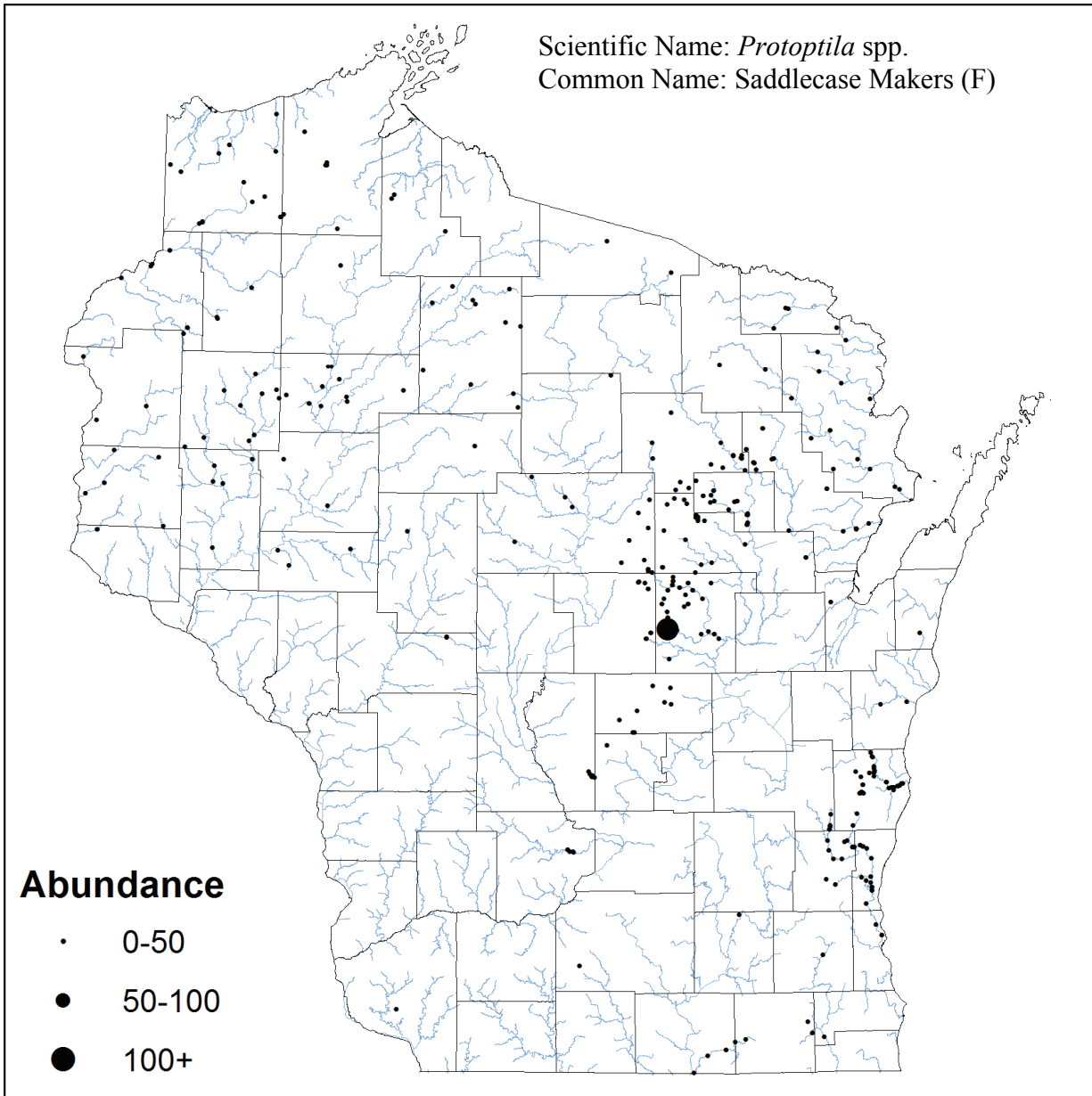


# Trichoptera Glossosomatidae

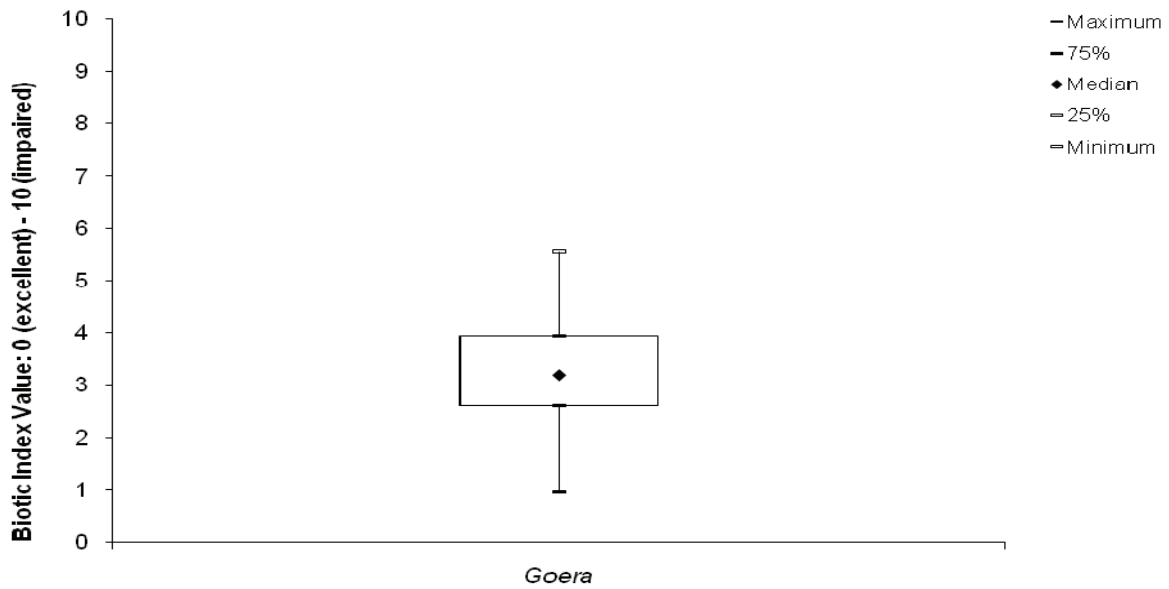
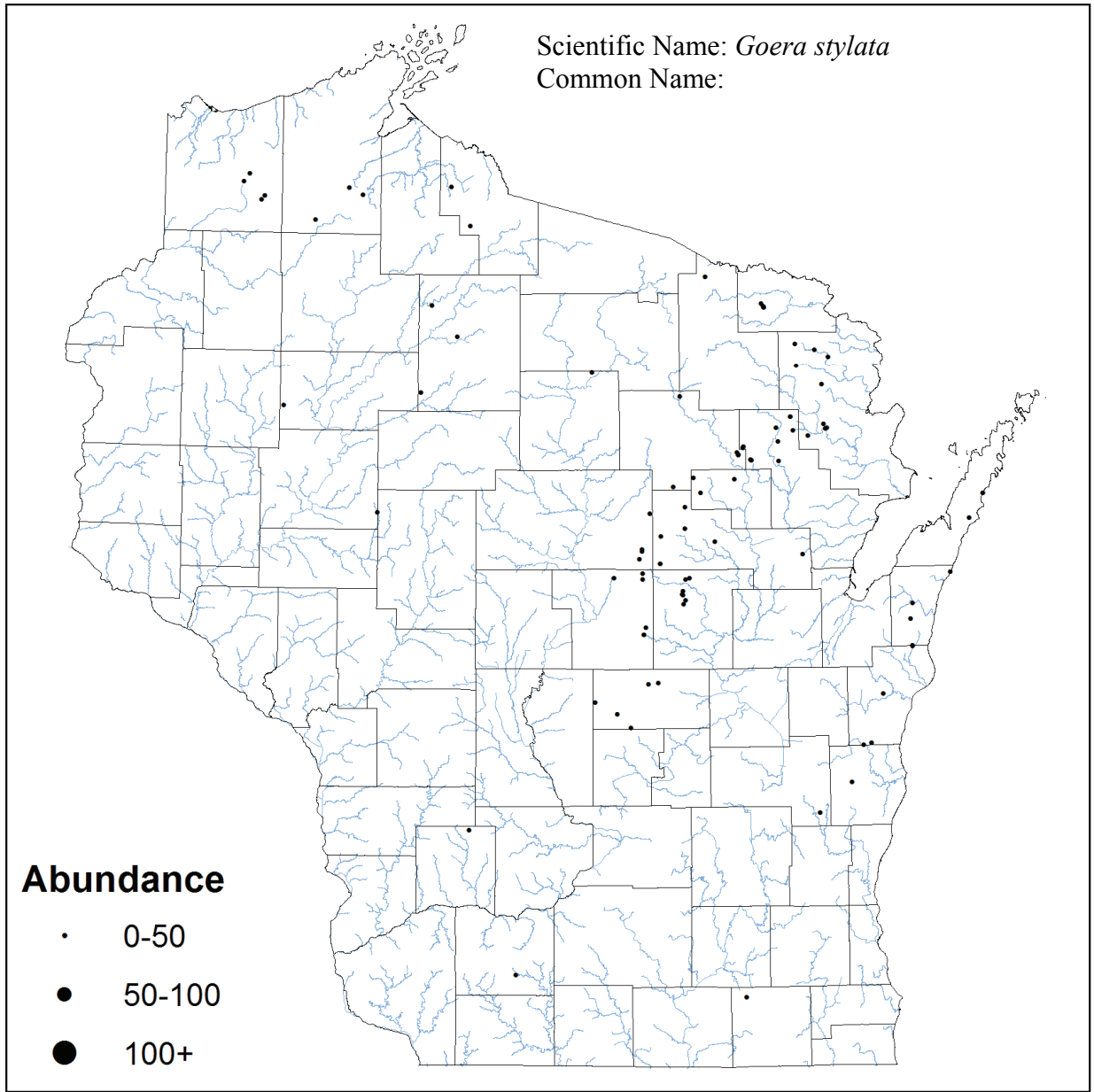




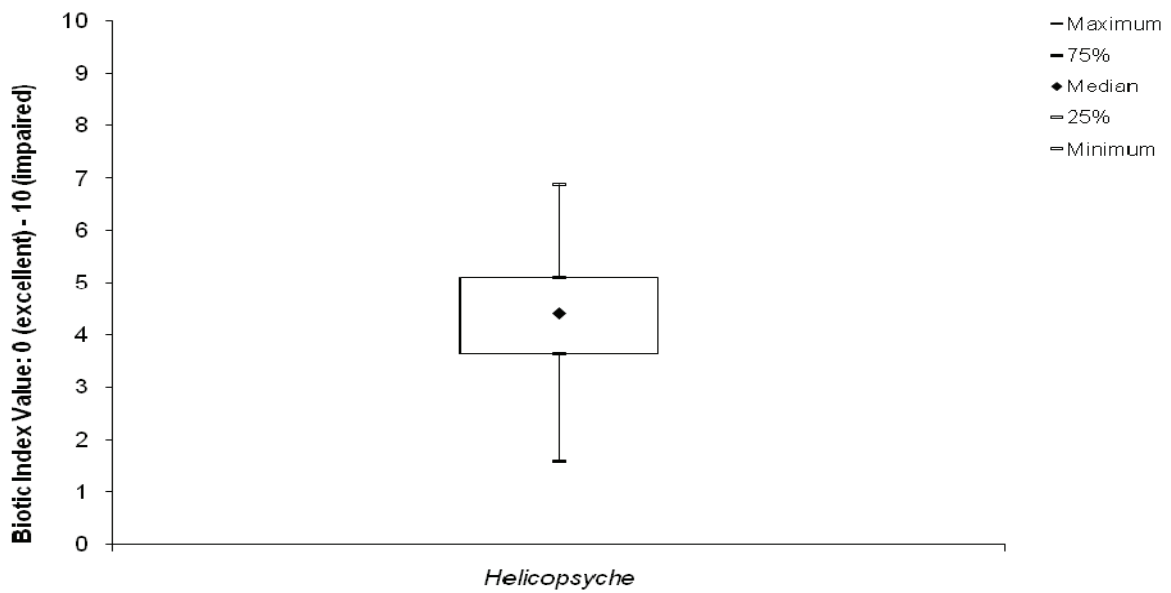
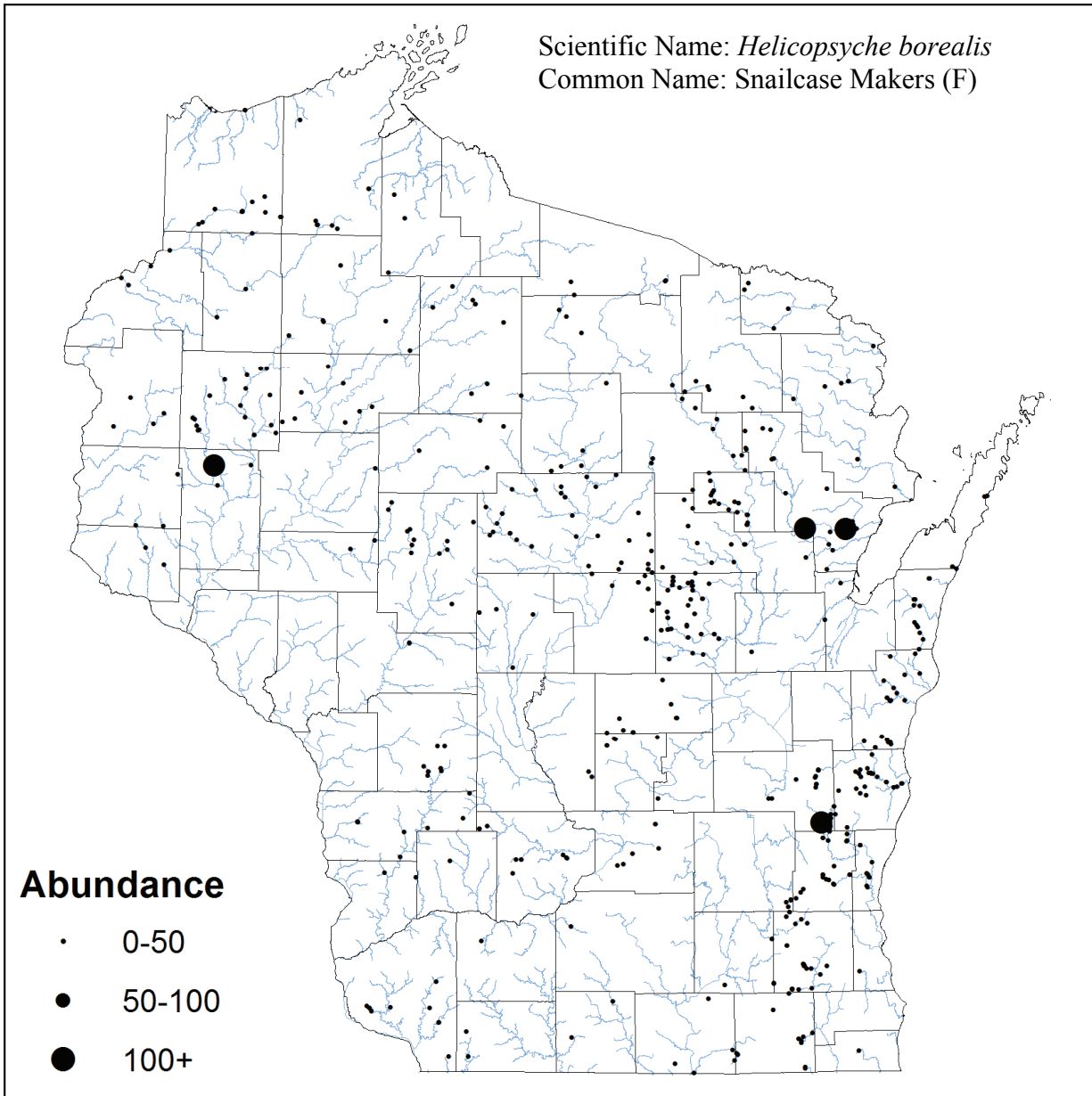
# Trichoptera Glossosomatidae



# Trichoptera Goeridae



# Trichoptera Helicopsychidae

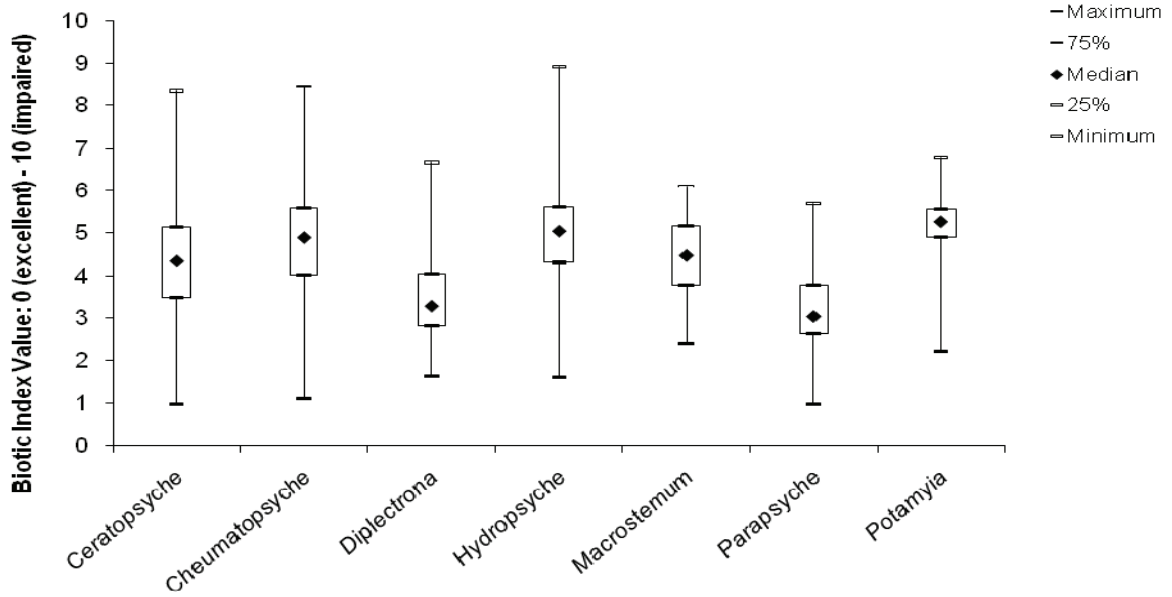
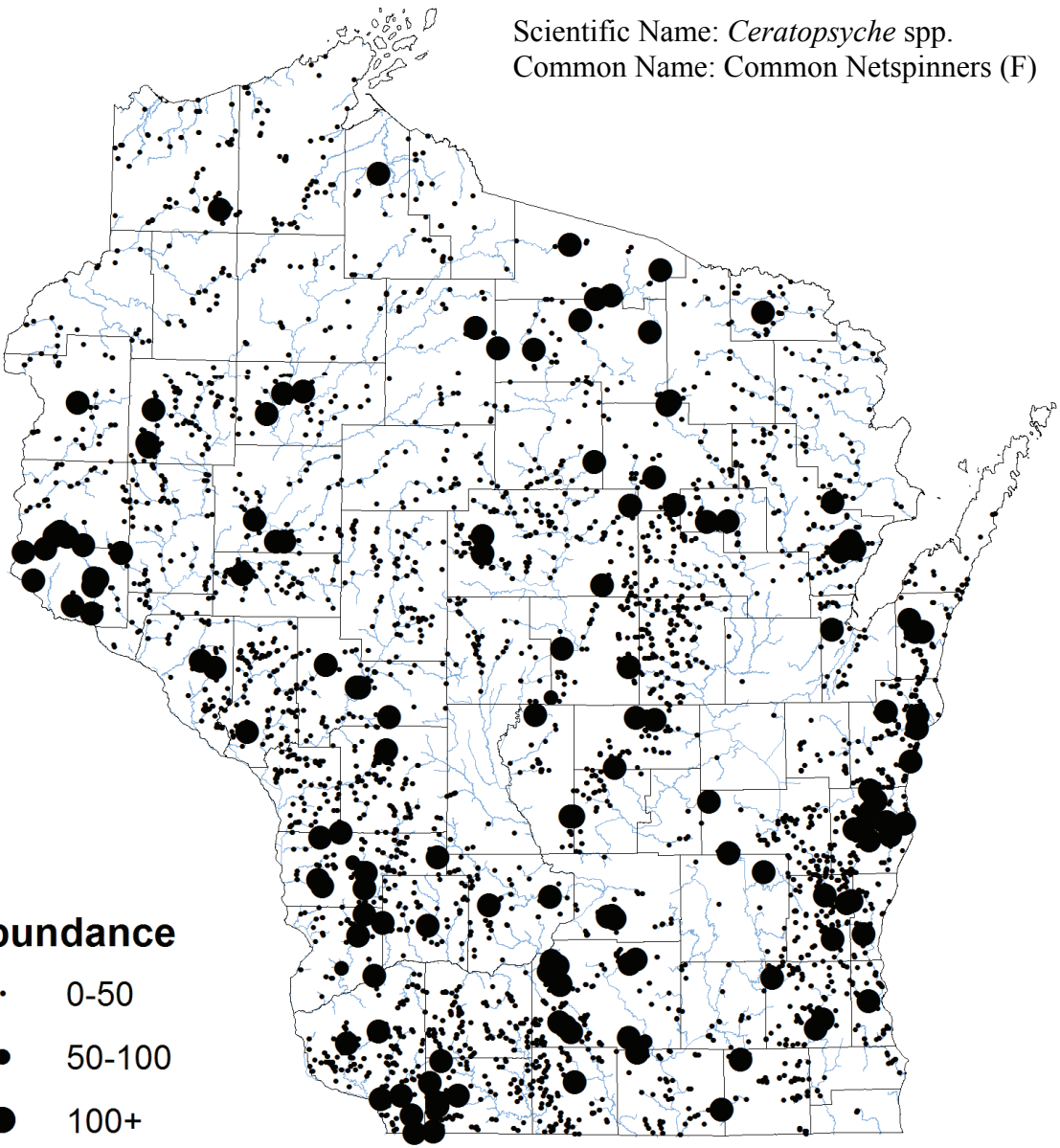


# Trichoptera Hydropsychidae

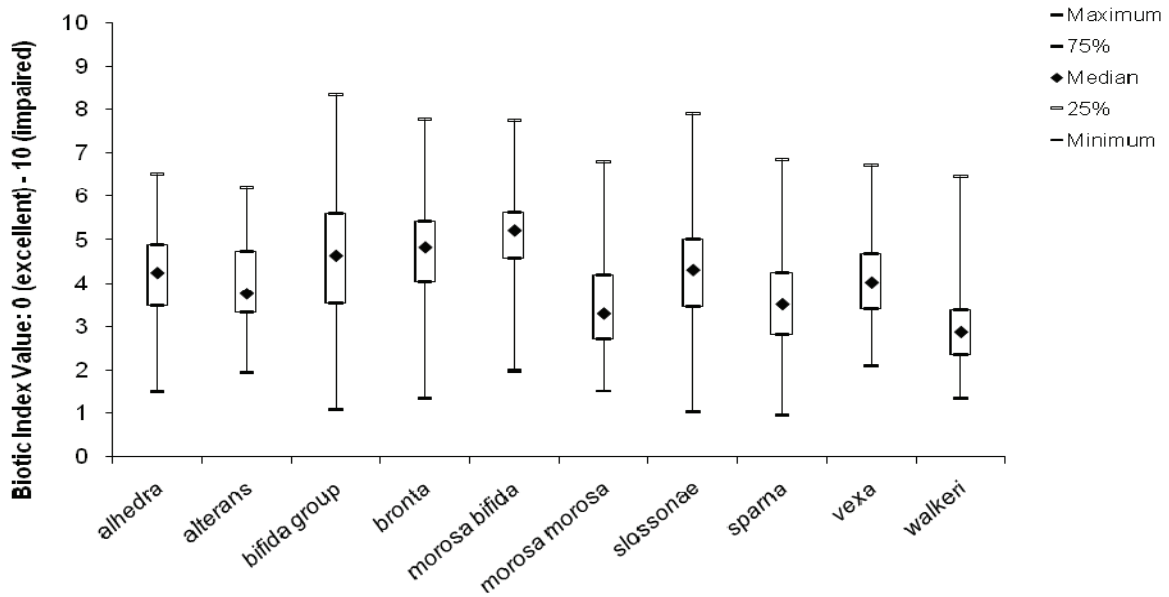
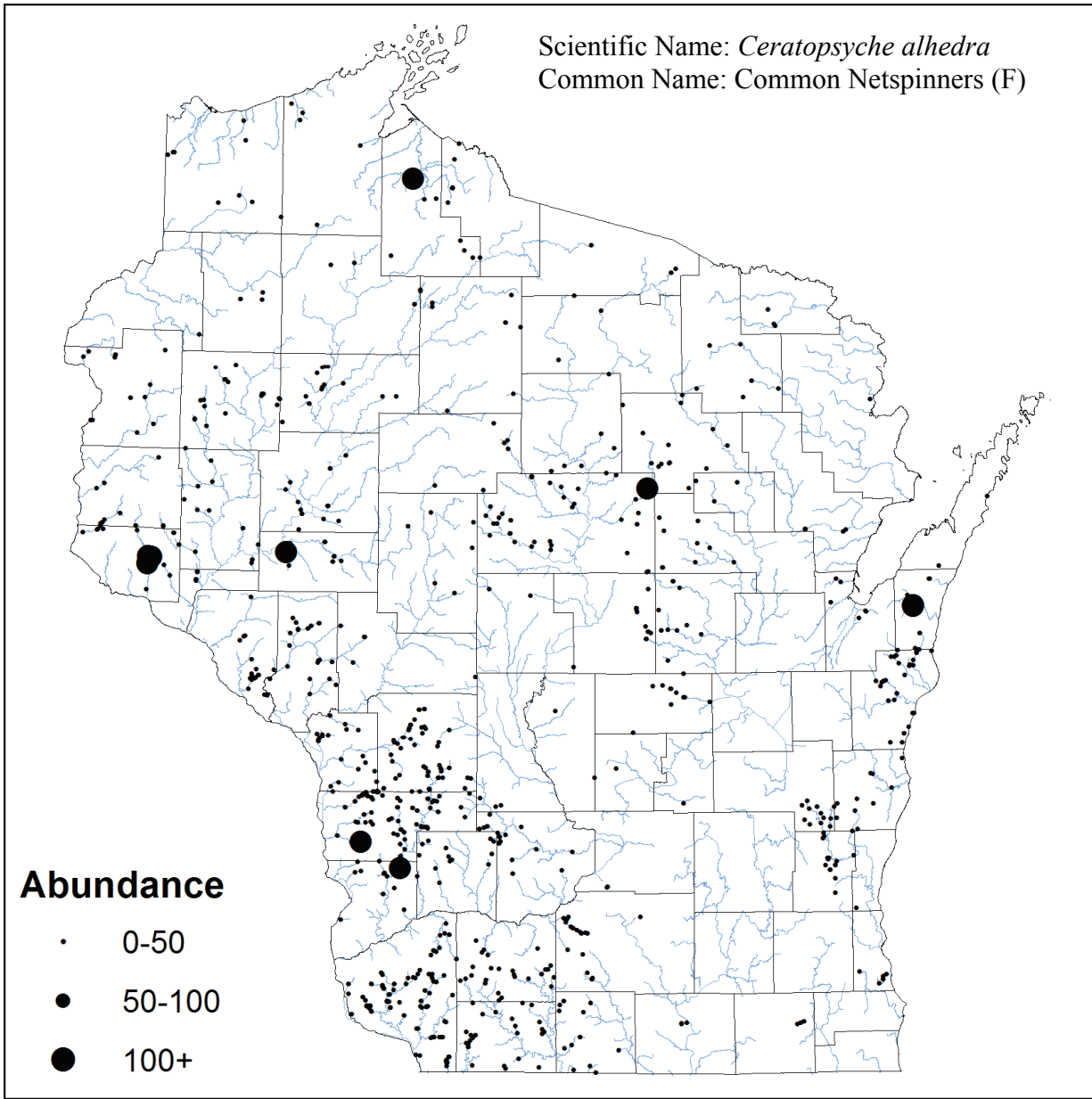
Scientific Name: *Ceratopsyche* spp.  
 Common Name: Common Netspinners (F)

## Abundance

- 0-50
- 50-100
- 100+



# Trichoptera Hydropsychidae

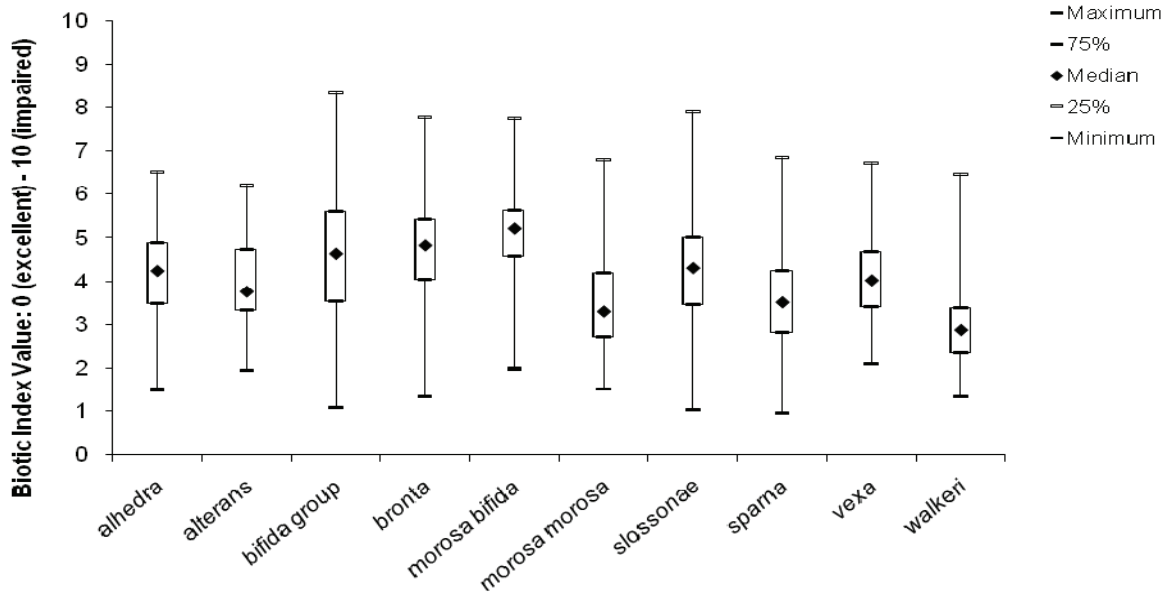
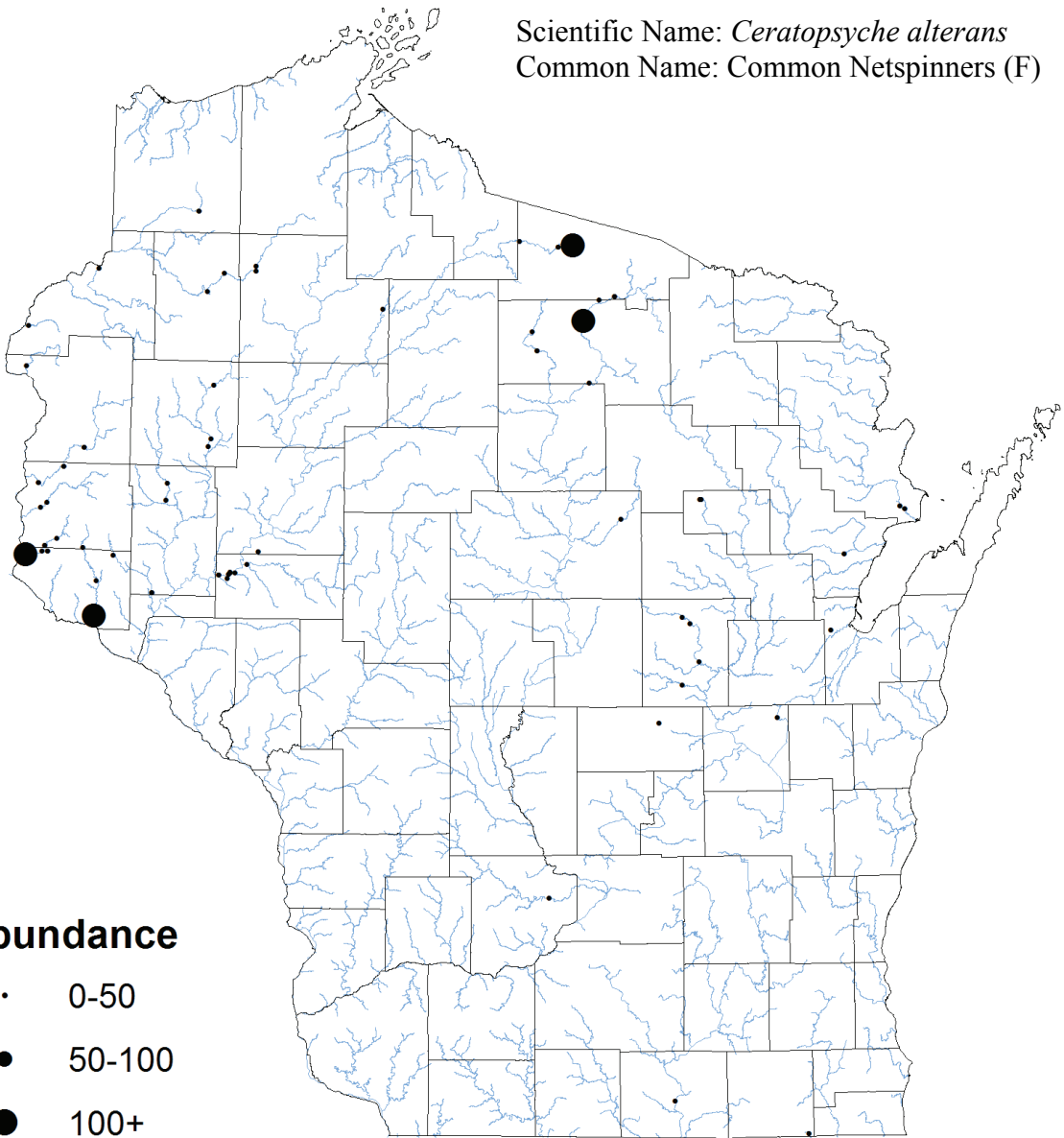


# Trichoptera Hydropsychidae

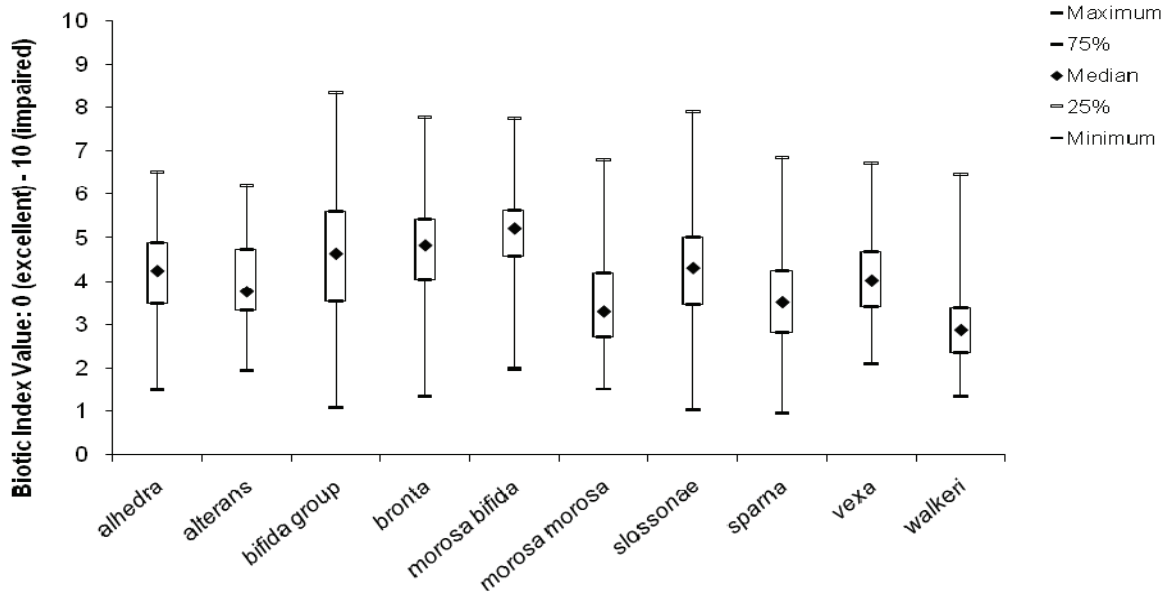
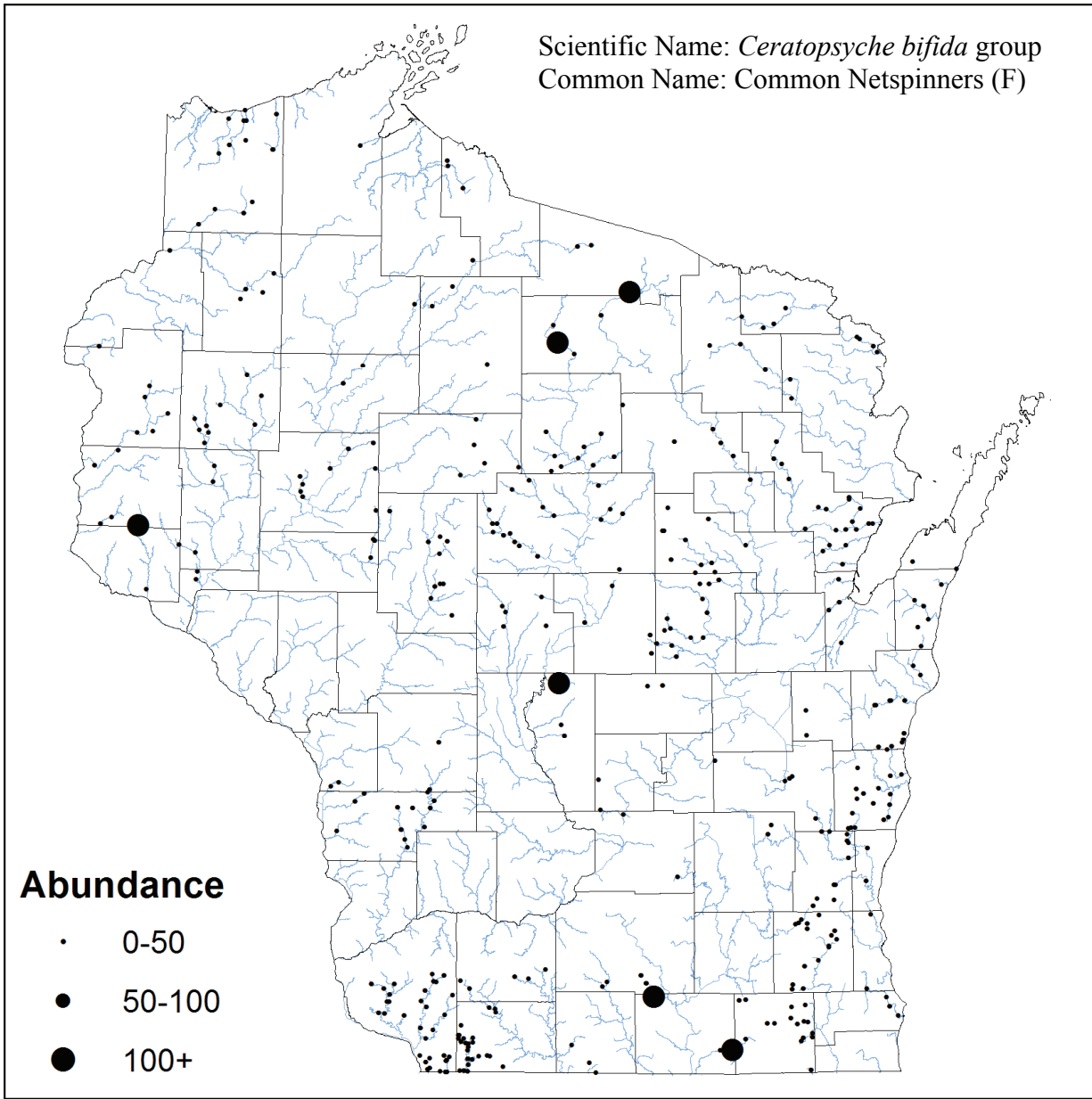
Scientific Name: *Ceratopsyche alterans*  
 Common Name: Common Netspinners (F)

## Abundance

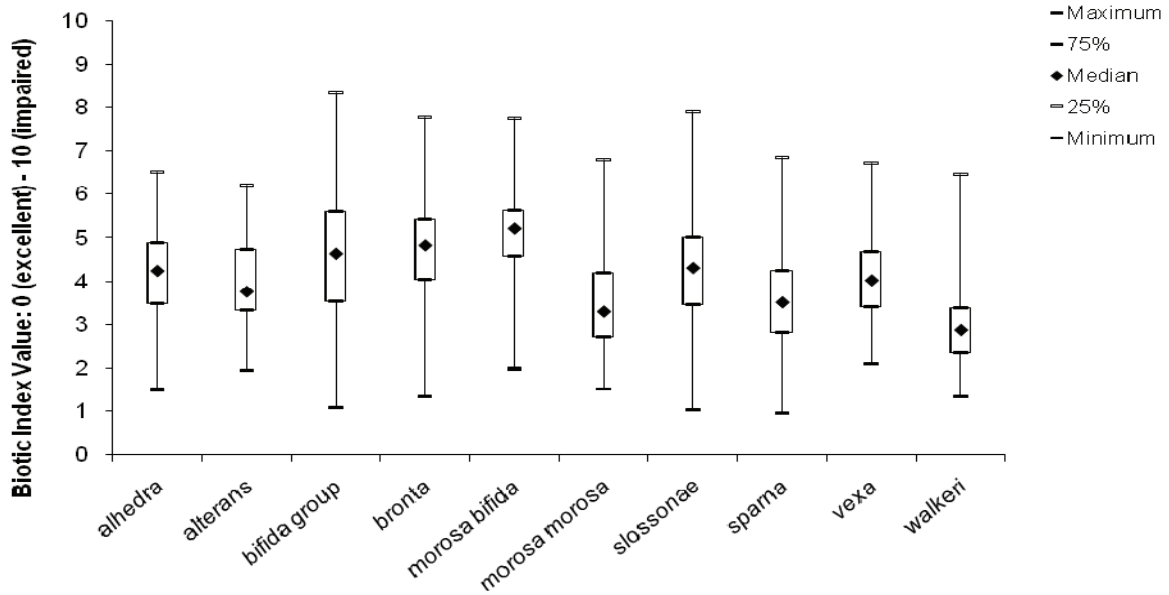
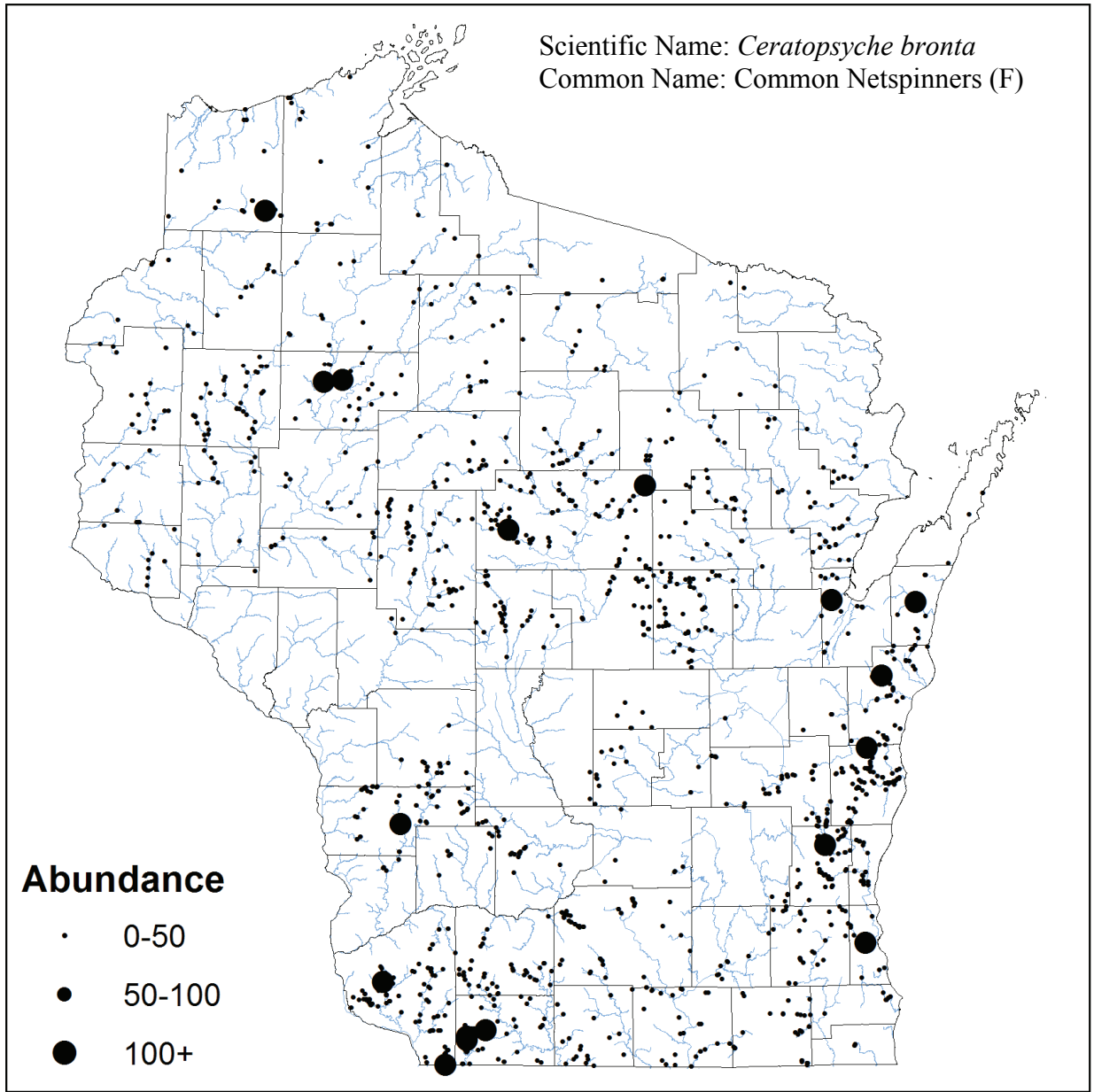
- 0-50
- 50-100
- 100+



# Trichoptera Hydropsychidae

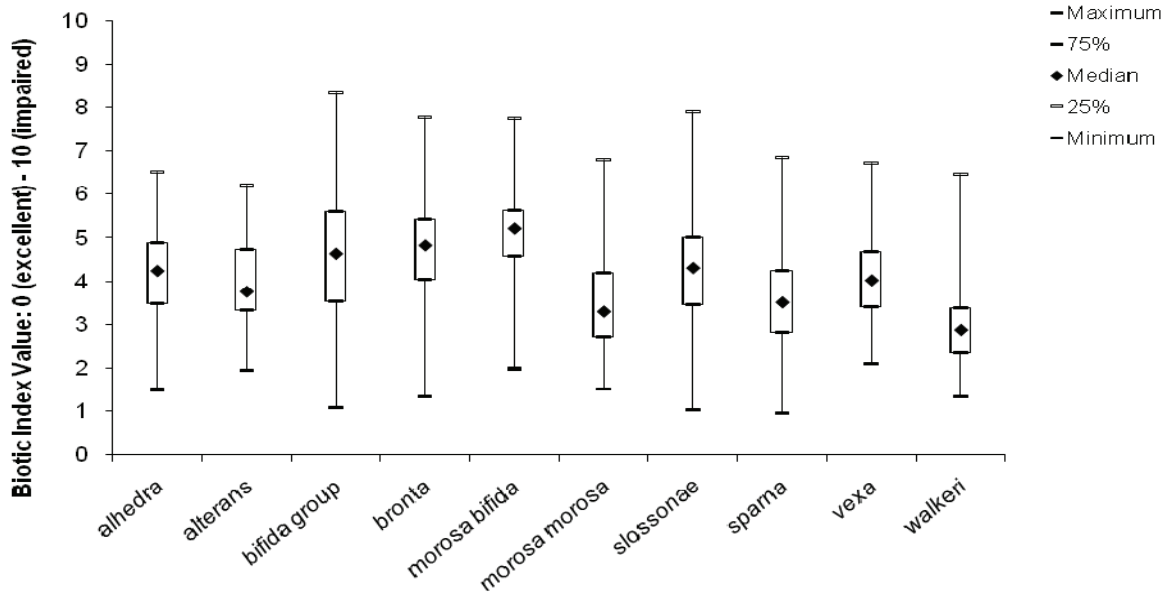
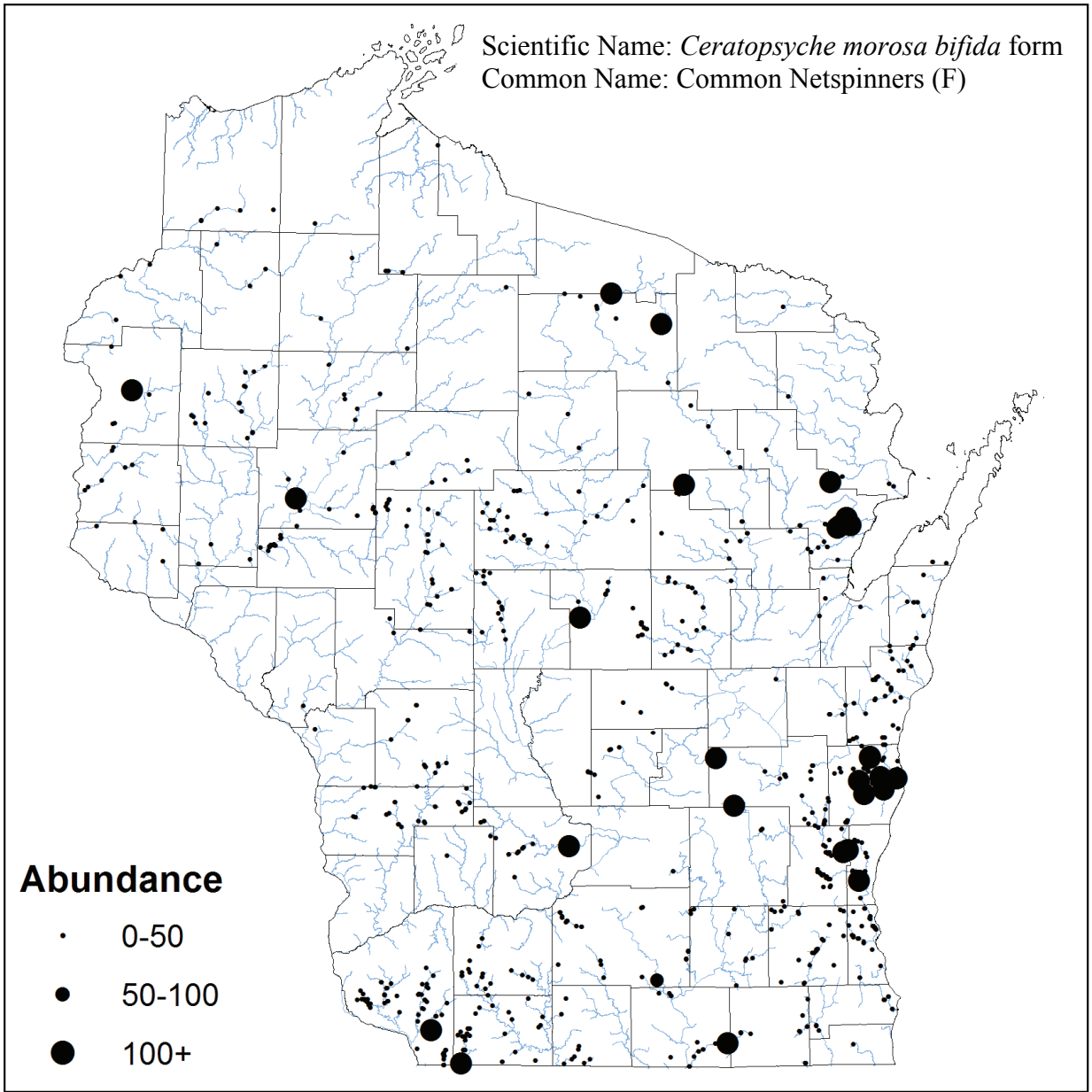


# Trichoptera Hydropsychidae





# Trichoptera Hydropsychidae

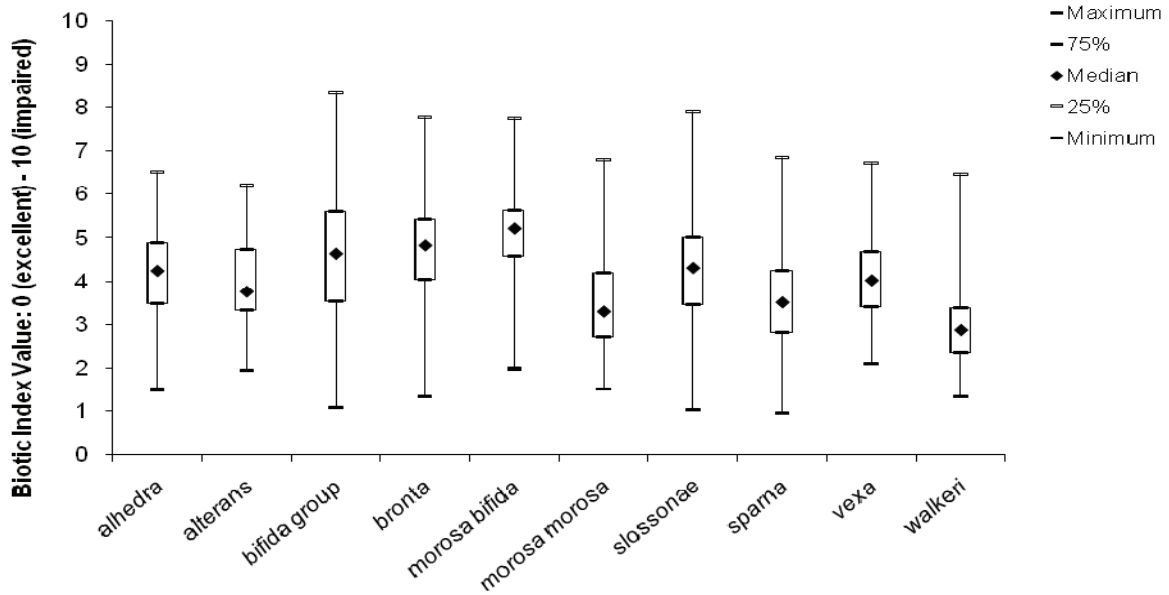
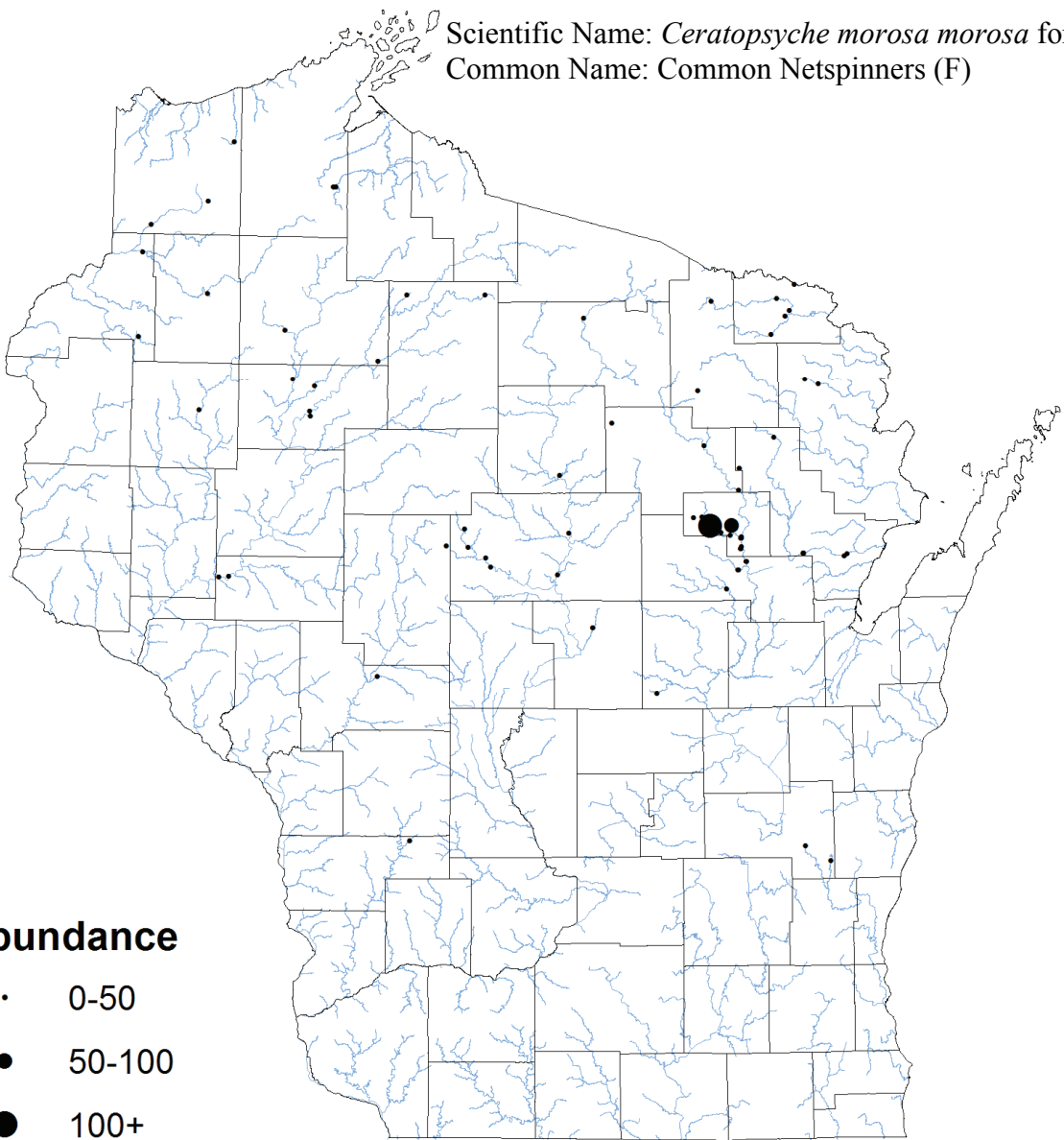


# Trichoptera Hydropsychidae

Scientific Name: *Ceratopsyche morosa morosa* form  
 Common Name: Common Netspinners (F)

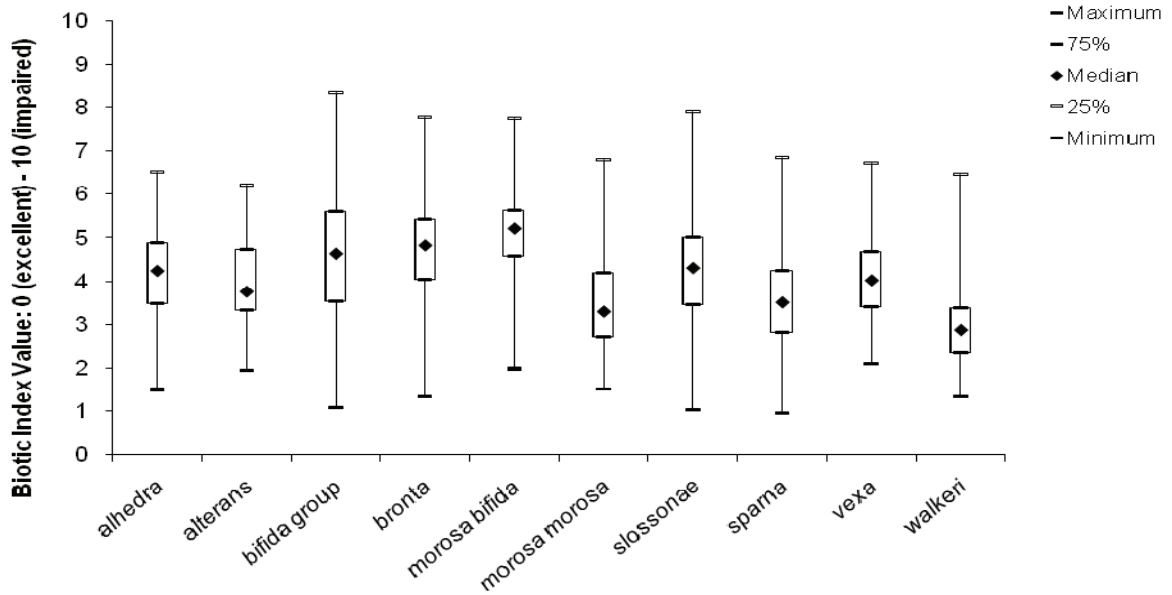
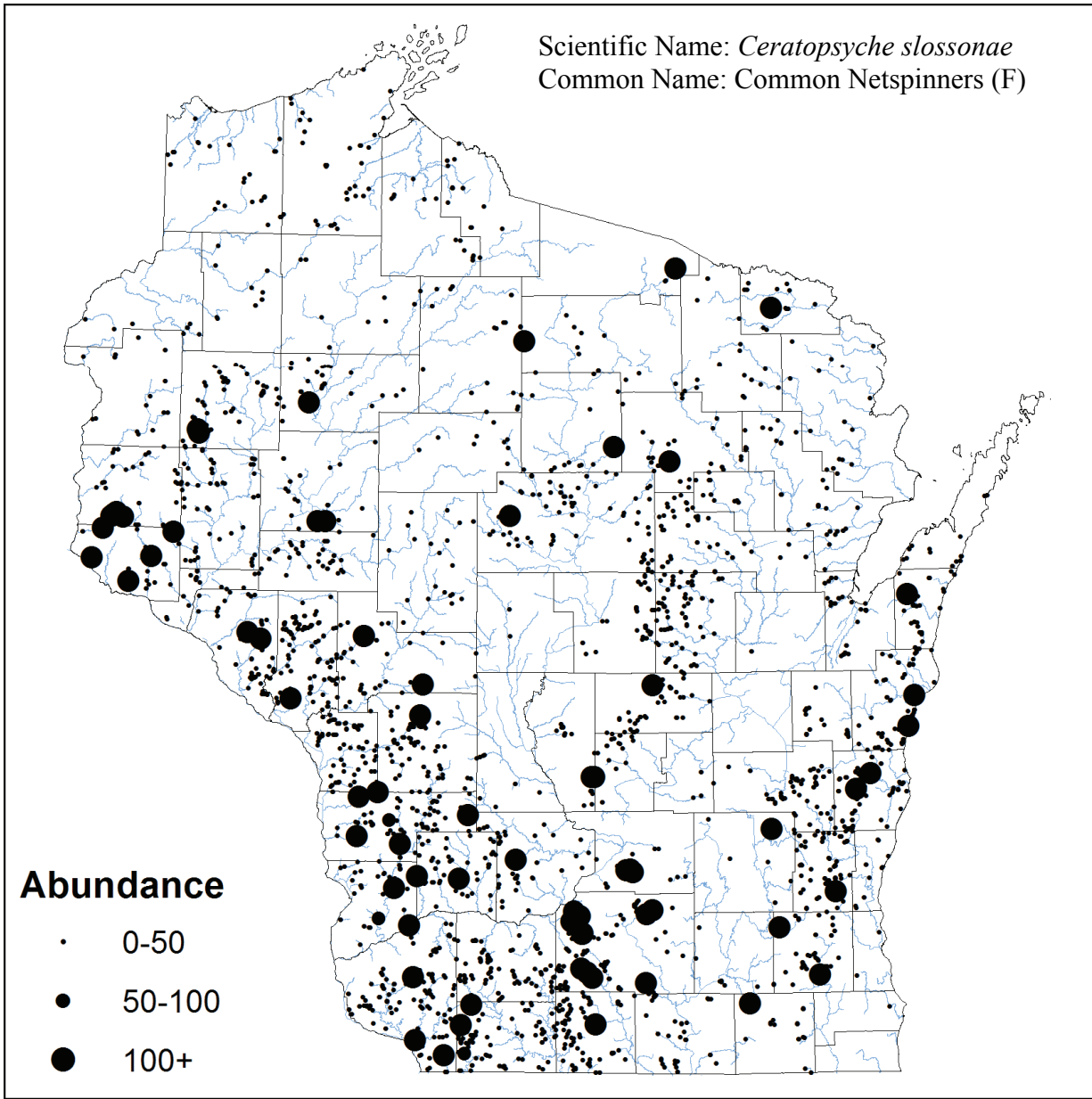
## Abundance

- 0-50
- 50-100
- 100+

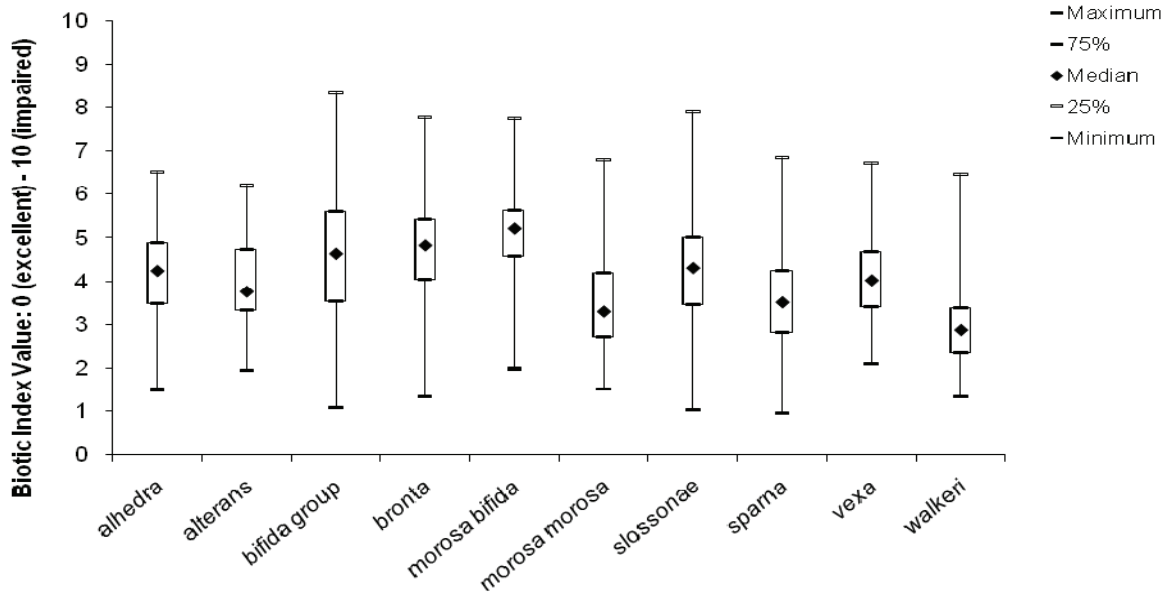
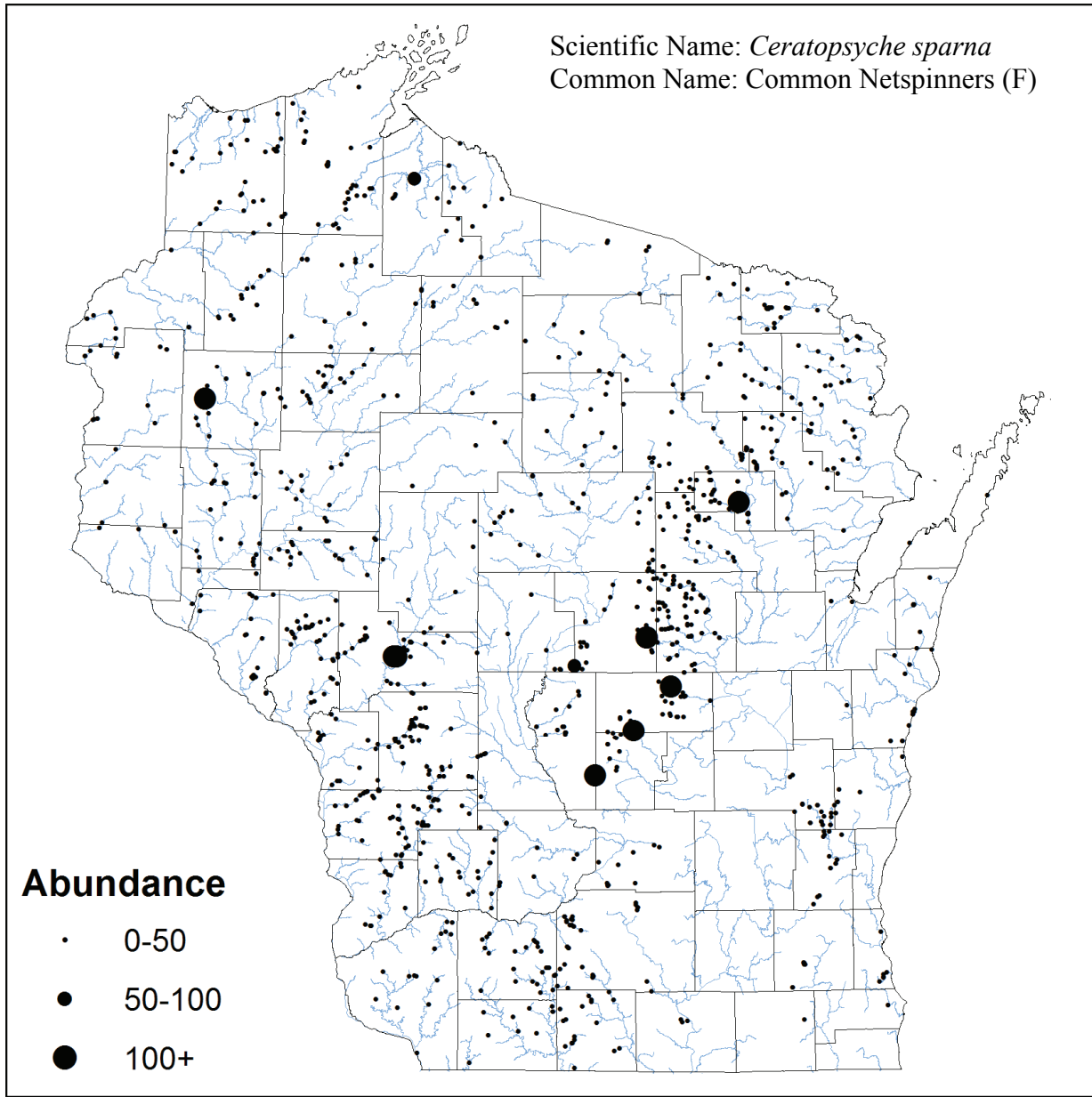


# Trichoptera Hydropsychidae

Scientific Name: *Ceratopsyche slossonae*  
 Common Name: Common Netspinners (F)

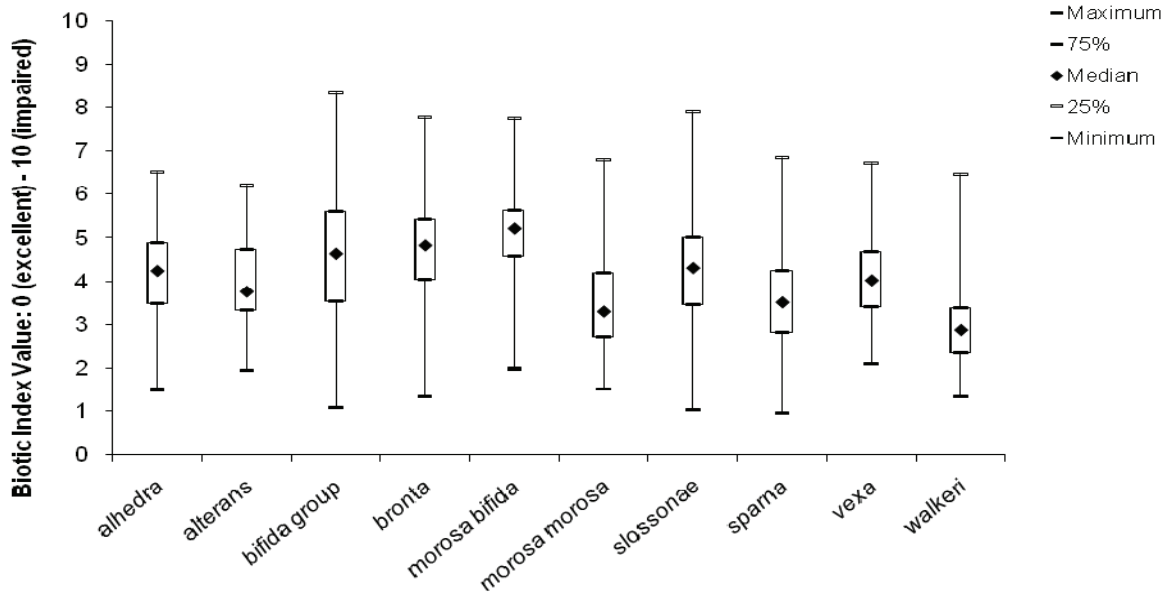
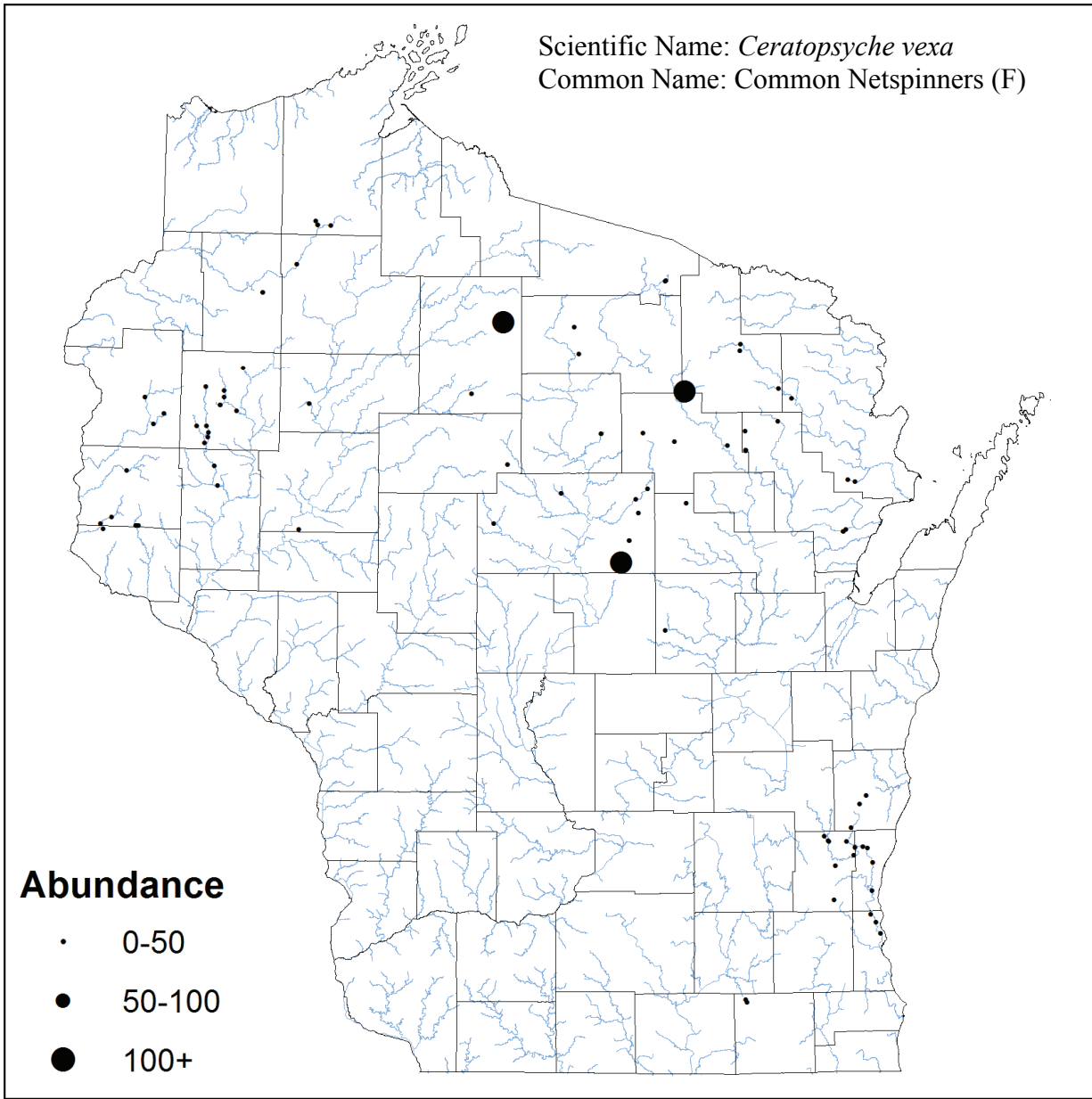


# Trichoptera Hydropsychidae



# Trichoptera Hydropsychidae

Scientific Name: *Ceratopsyche vexa*  
 Common Name: Common Netspinners (F)

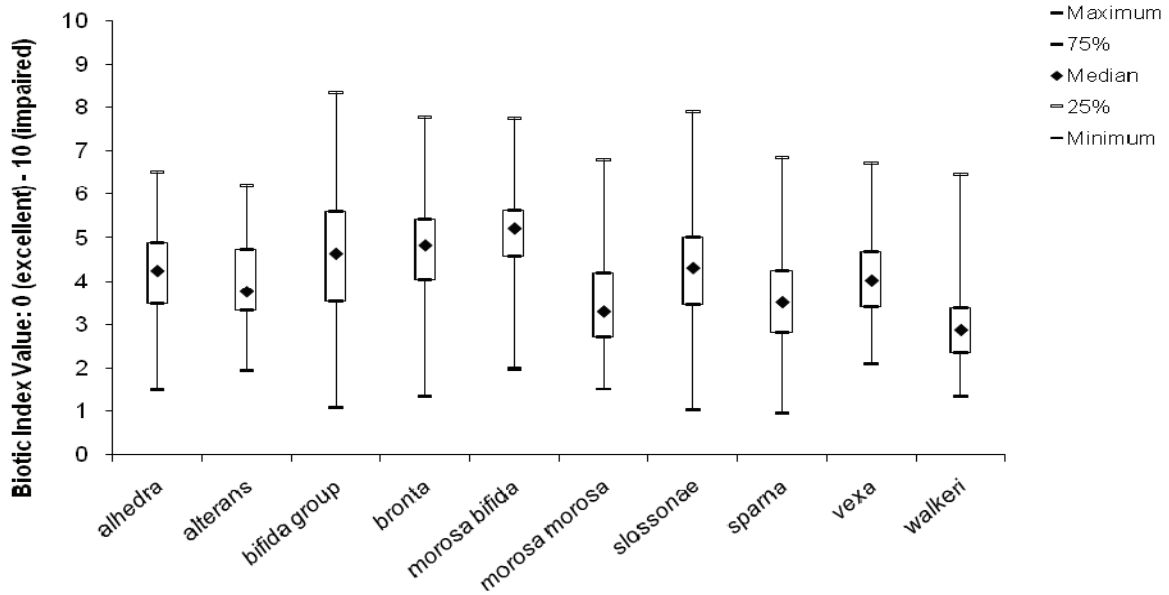
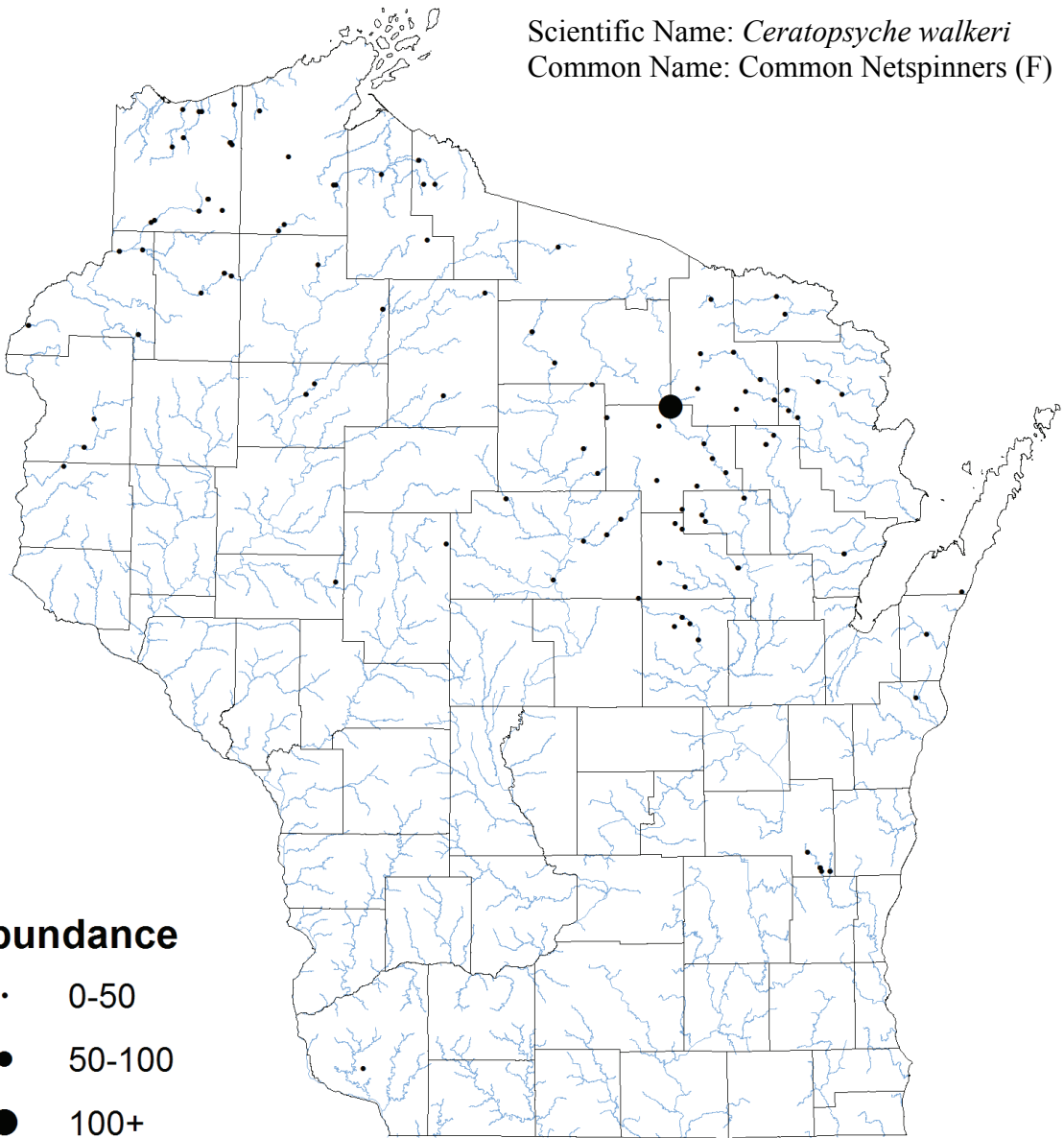


# Trichoptera Hydropsychidae

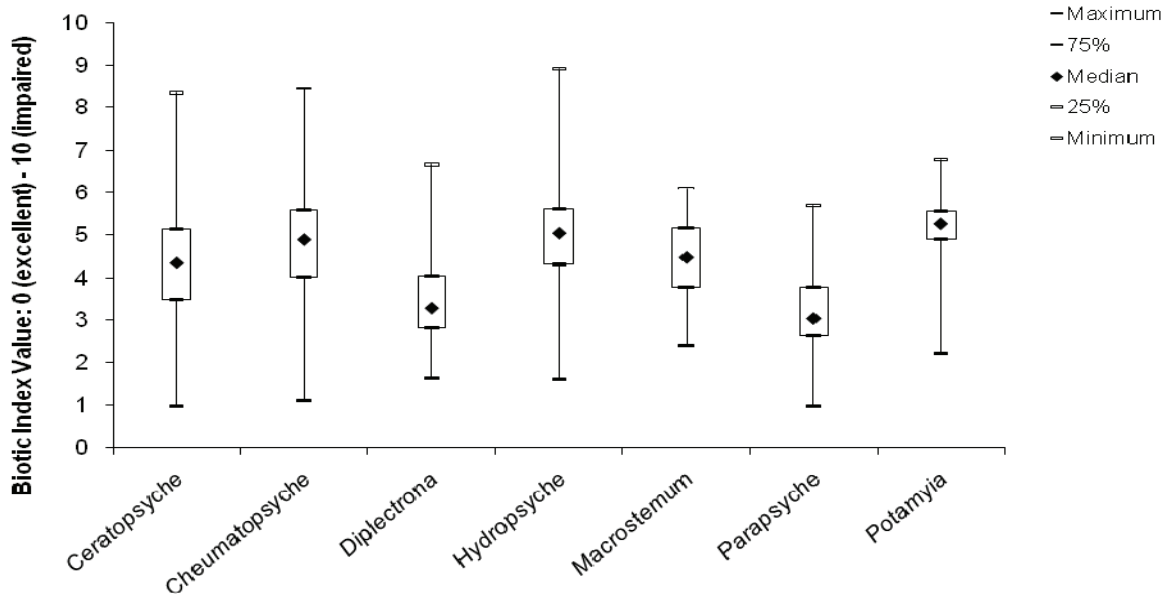
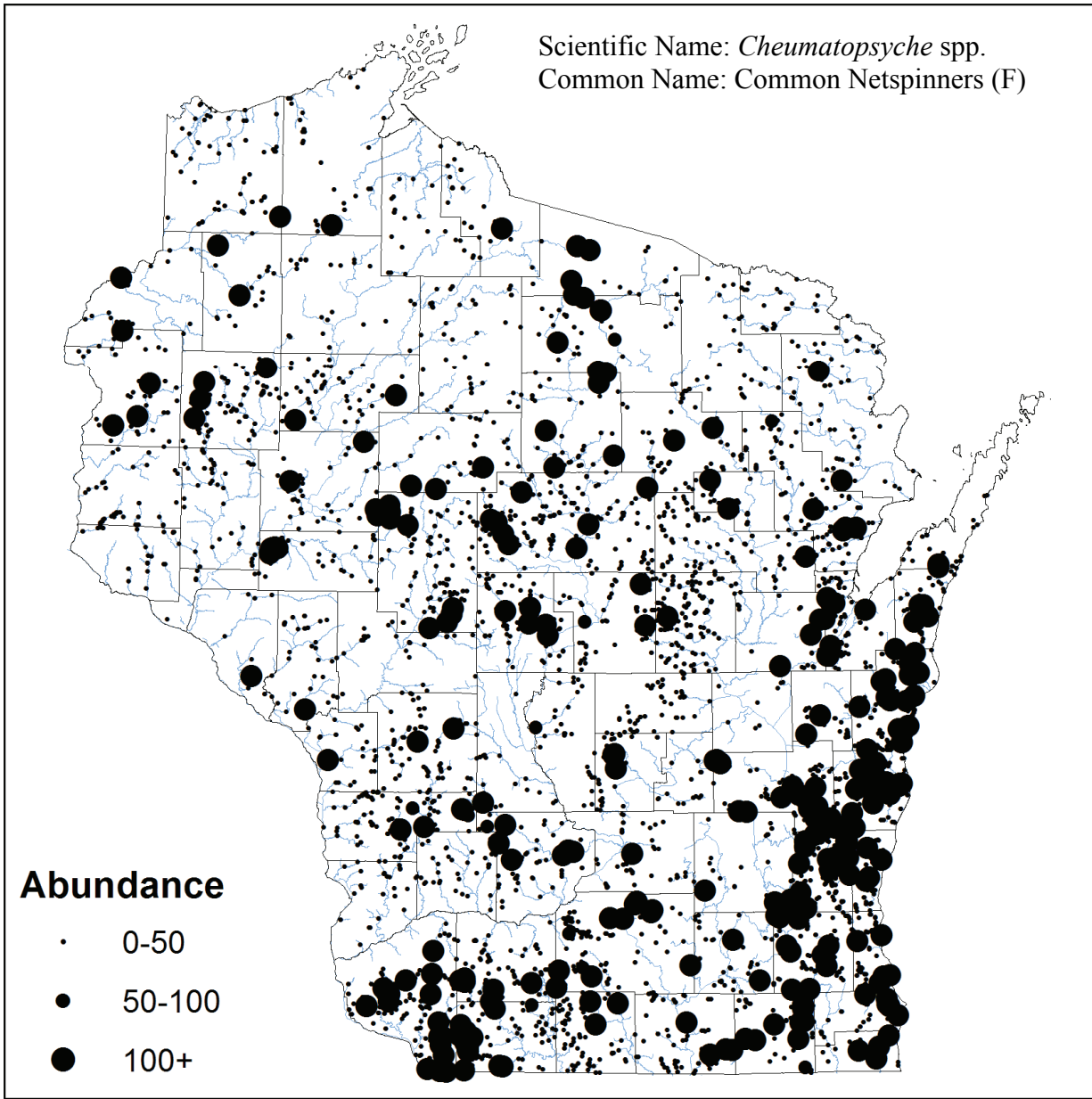
Scientific Name: *Ceratopsyche walkeri*  
 Common Name: Common Netspinners (F)

## Abundance

- 0-50
- 50-100
- 100+



# Trichoptera Hydropsychidae

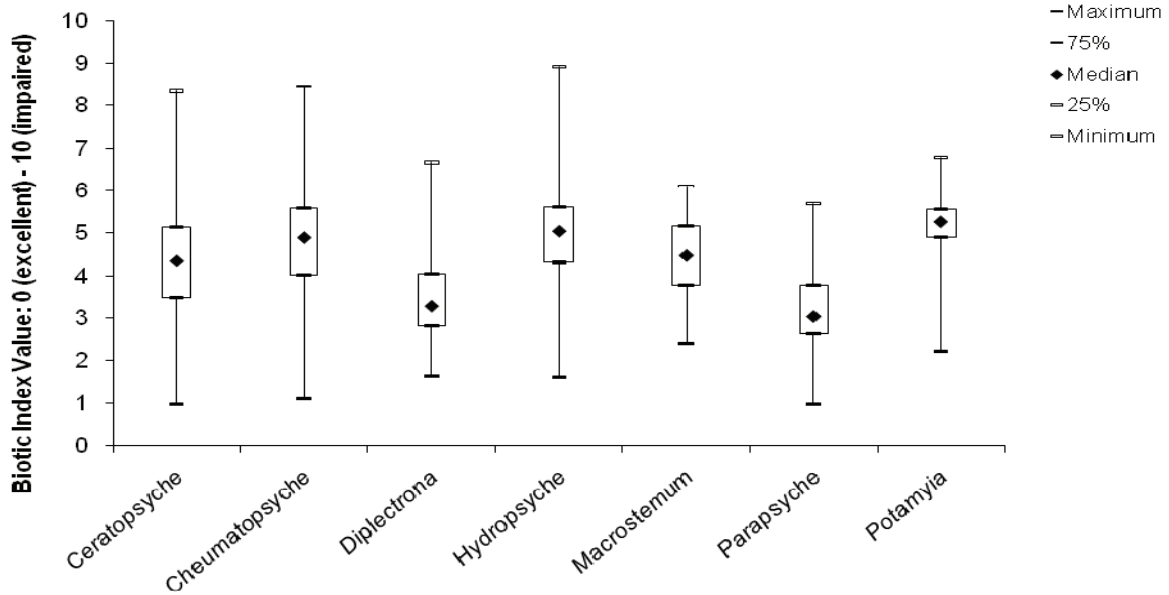
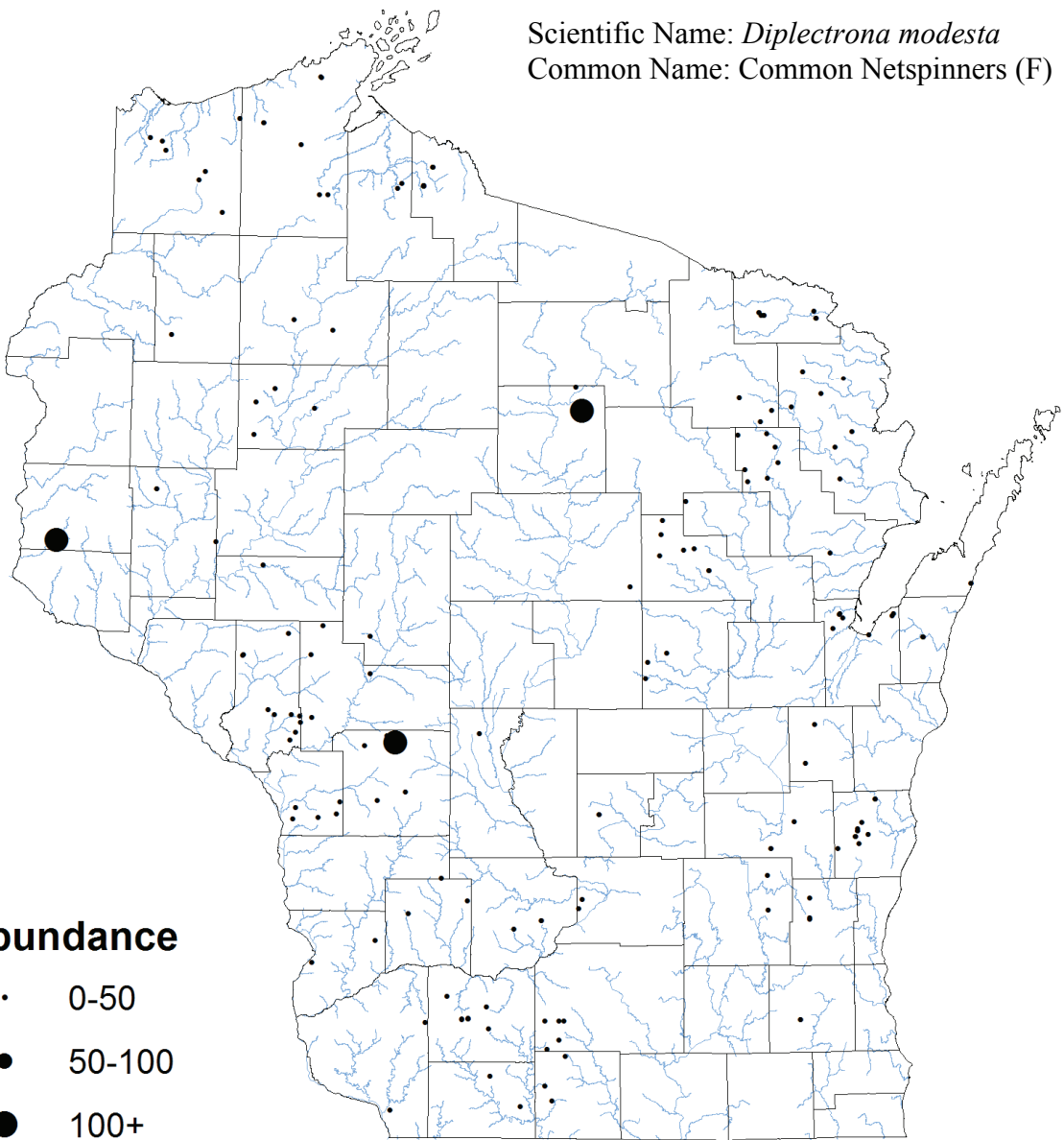


# Trichoptera Hydropsychidae

Scientific Name: *Diplectrona modesta*  
 Common Name: Common Netspinners (F)

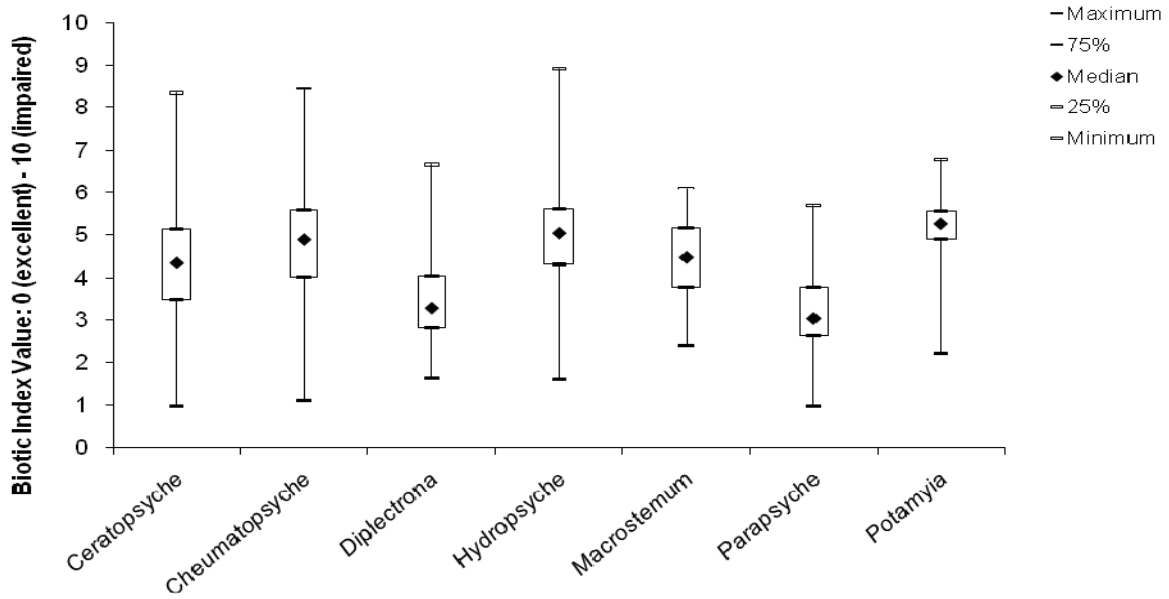
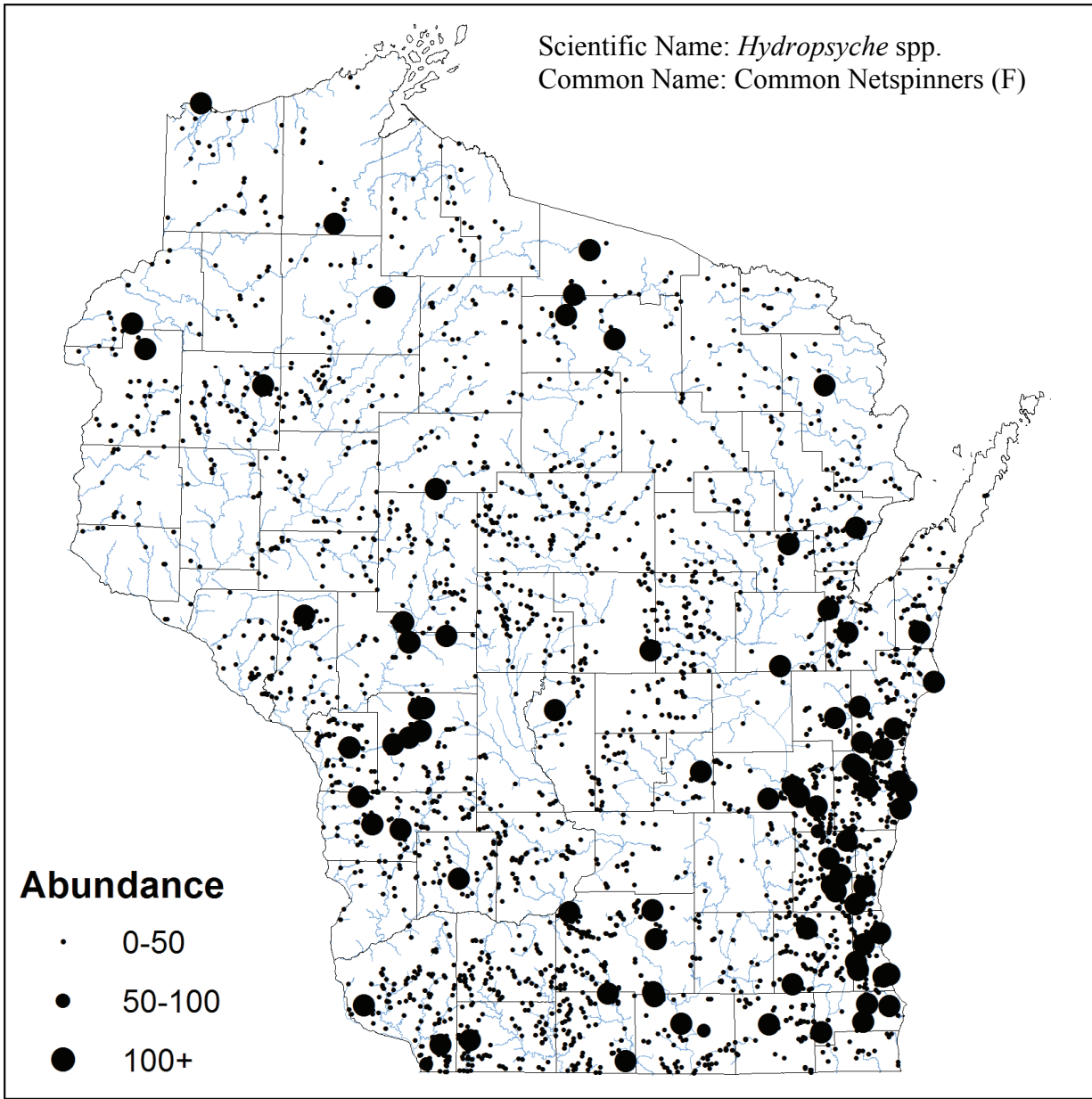
## Abundance

- 0-50
- 50-100
- 100+

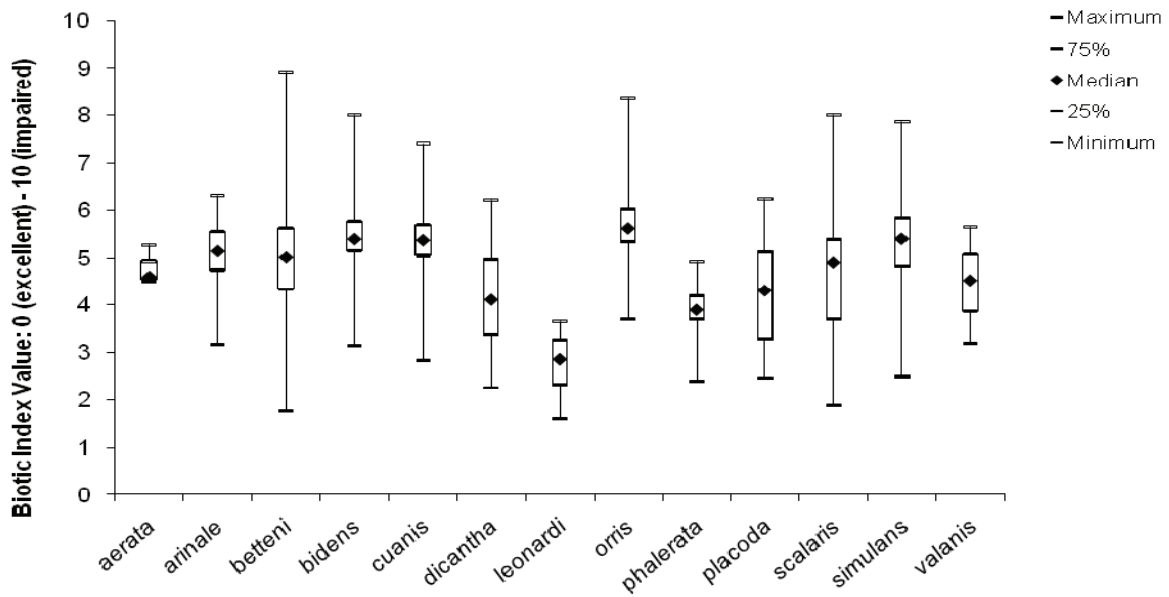
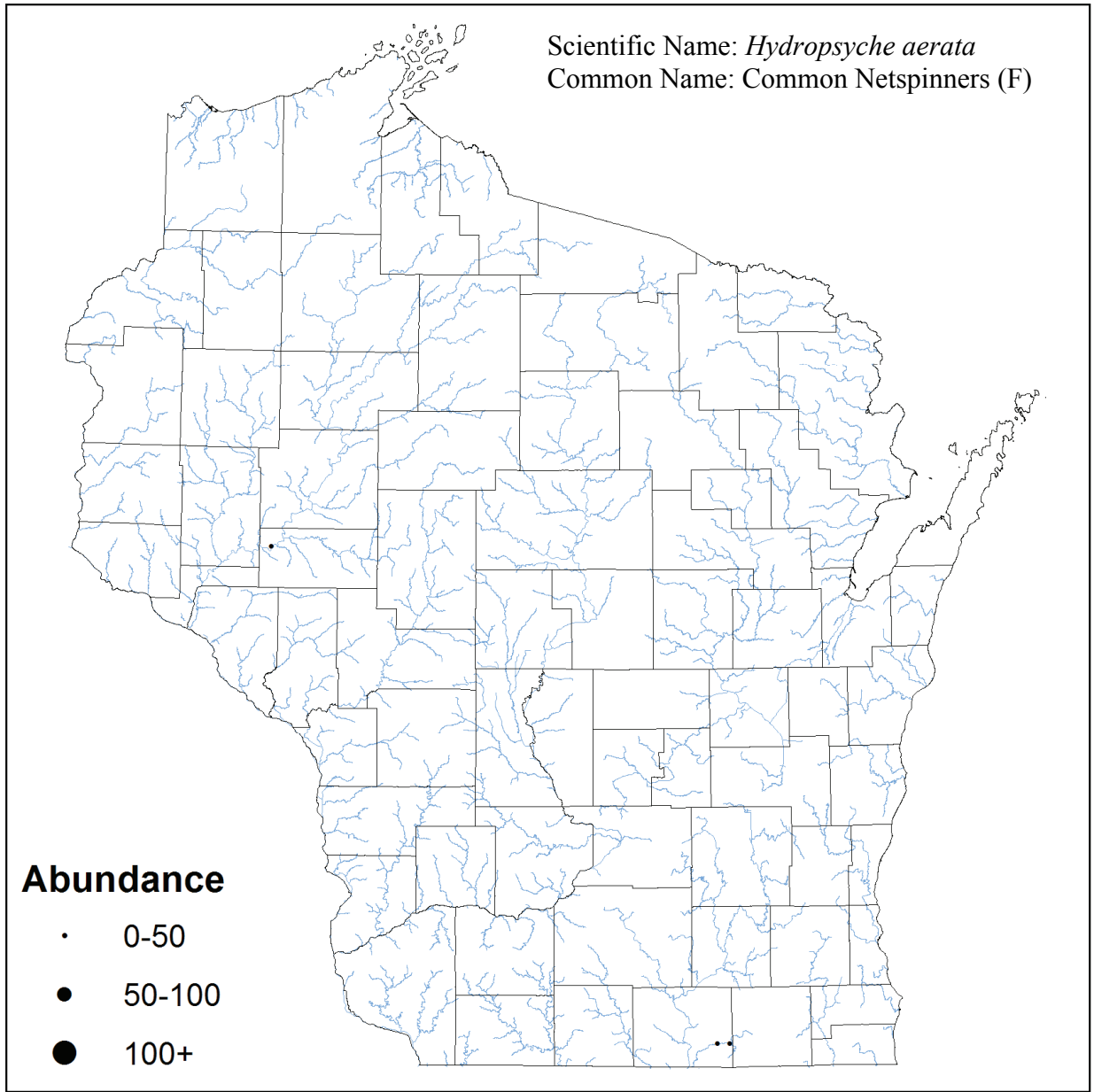




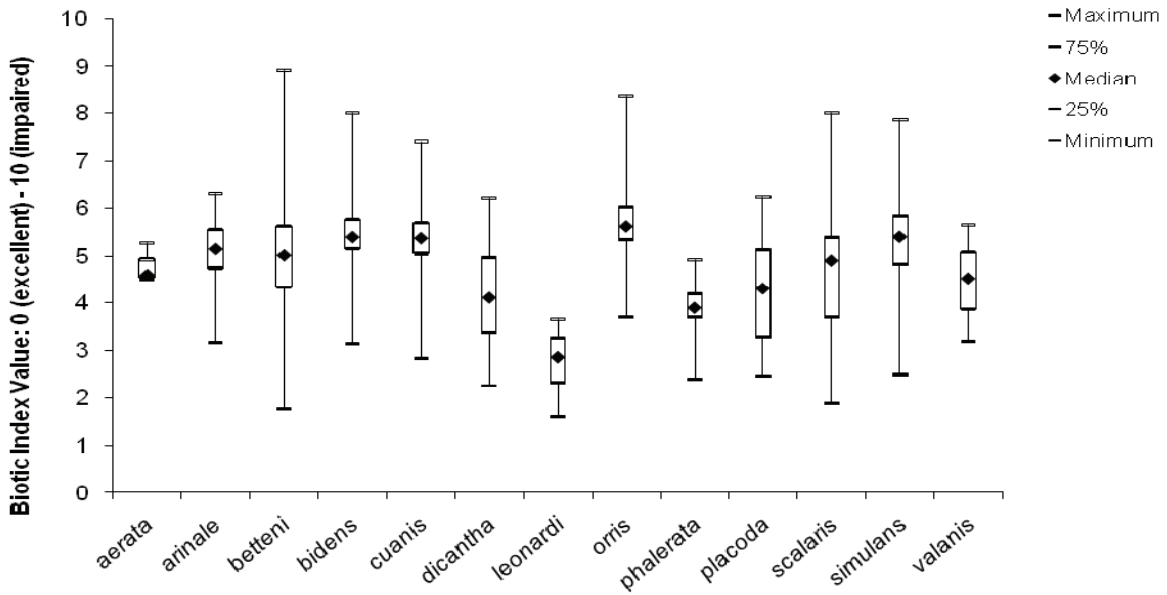
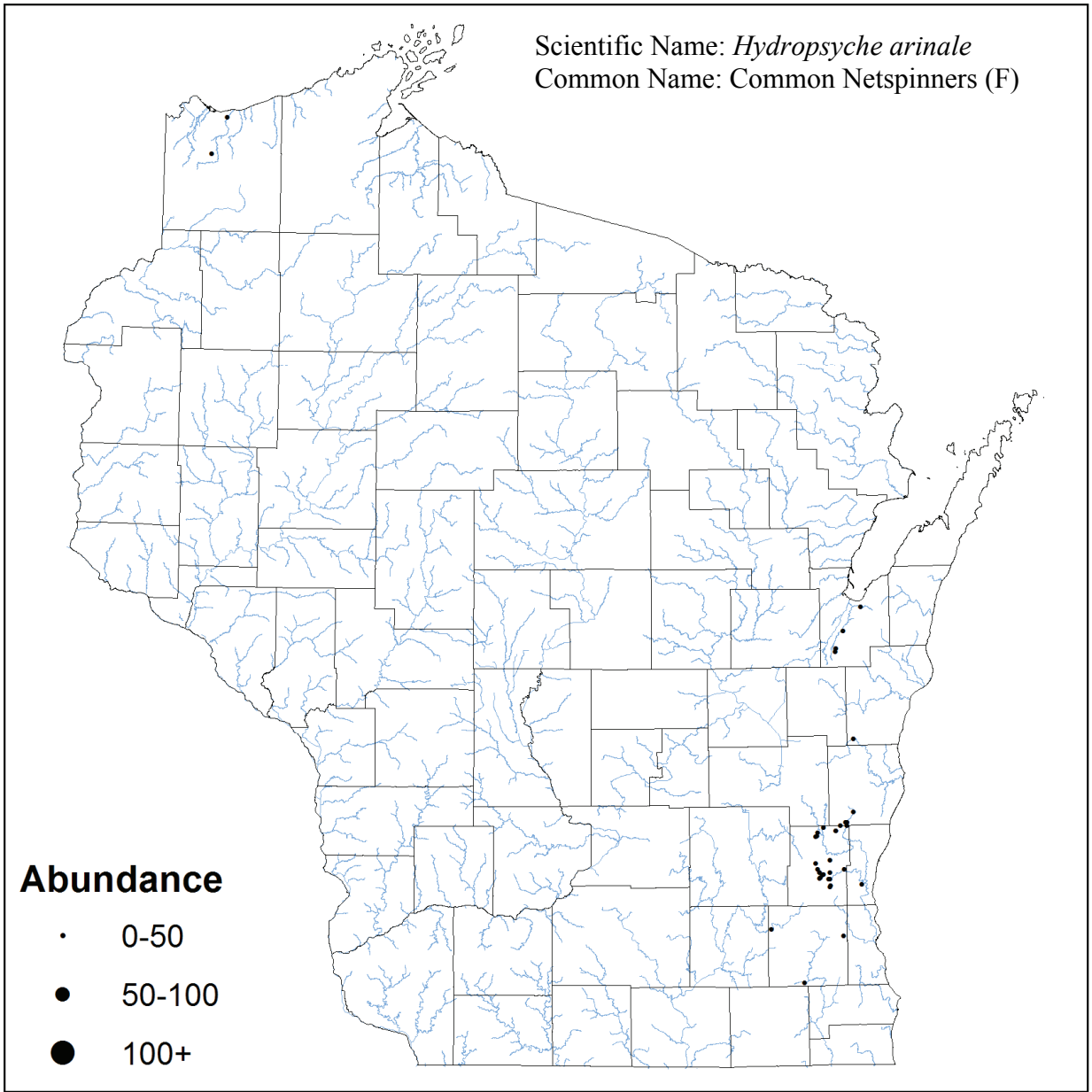
# Trichoptera Hydropsychidae



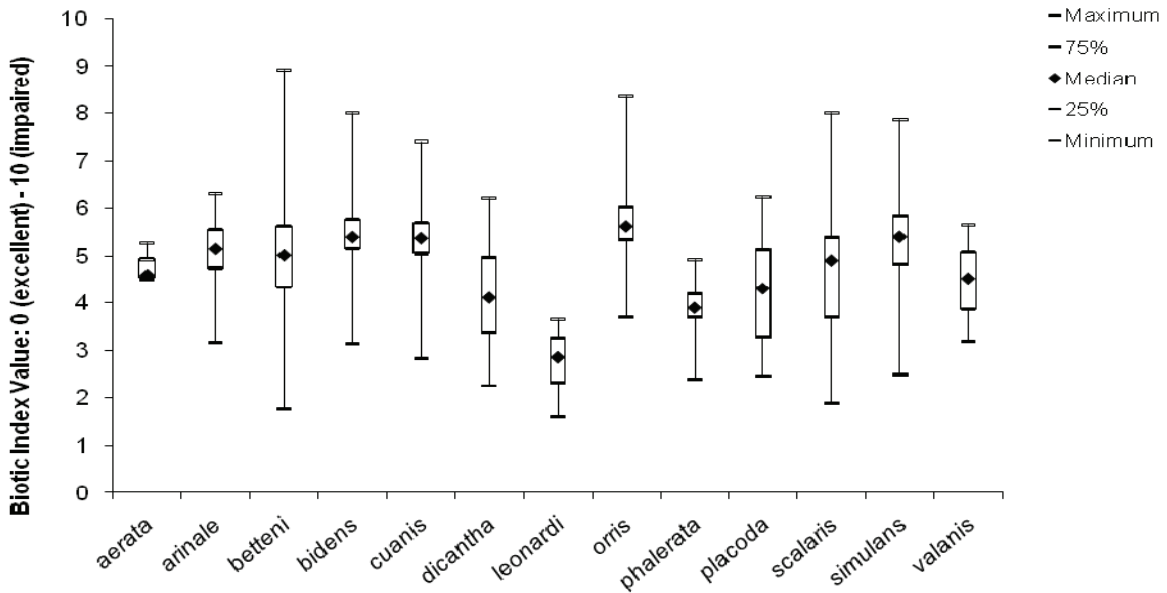
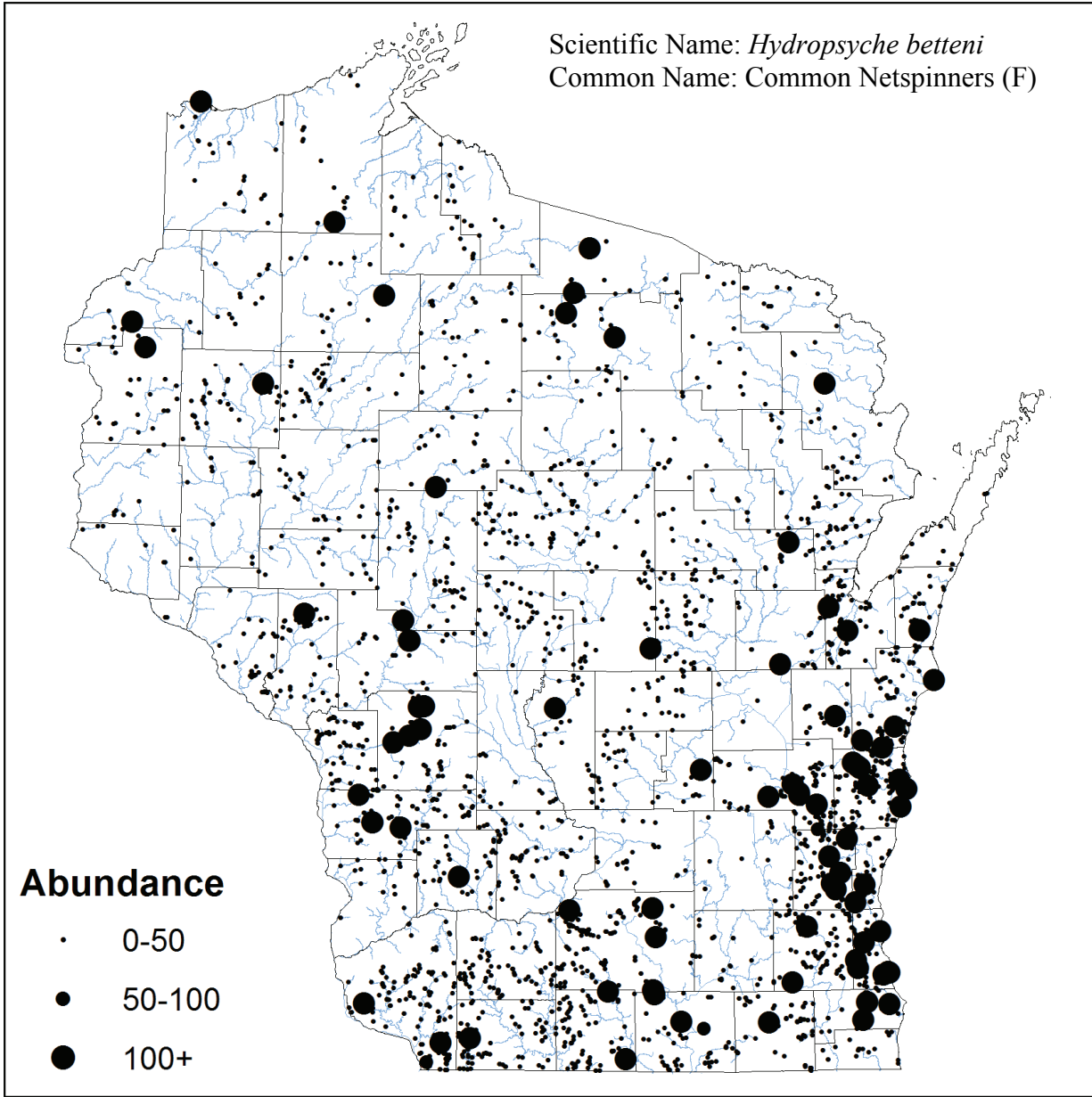
# Trichoptera Hydropsychidae



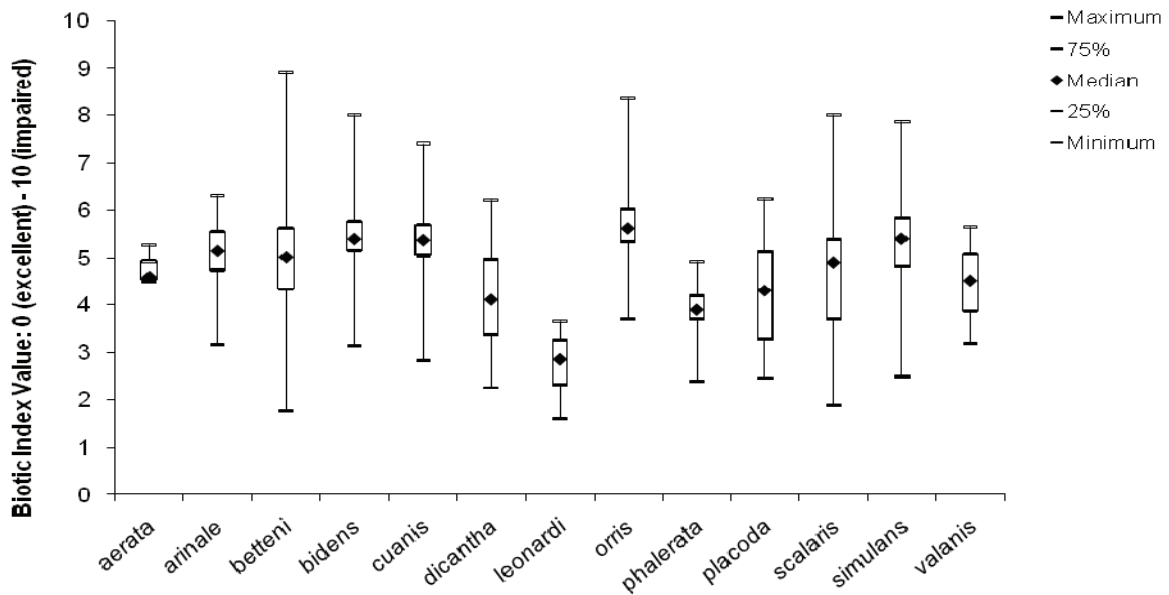
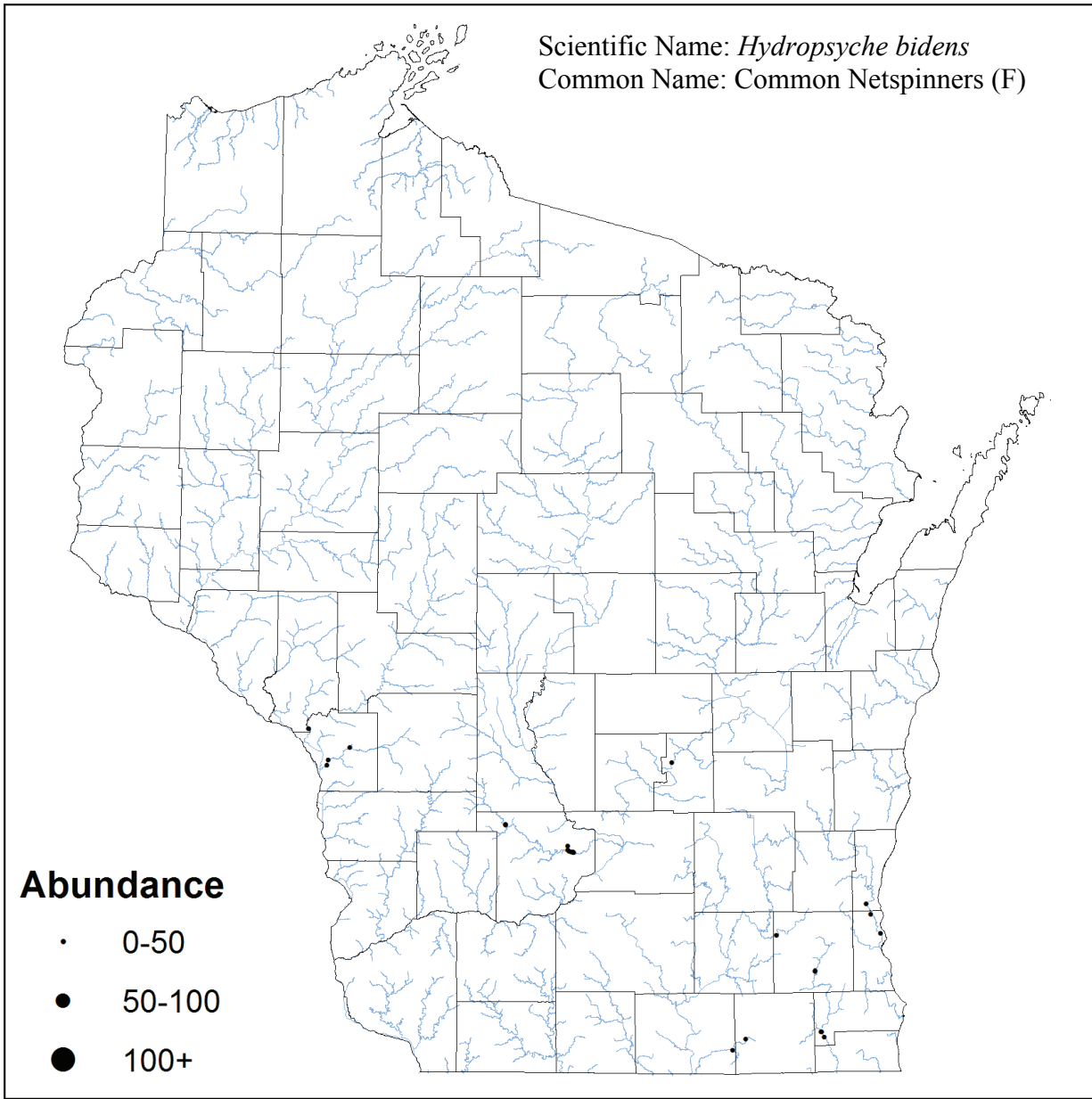
# Trichoptera Hydropsychidae



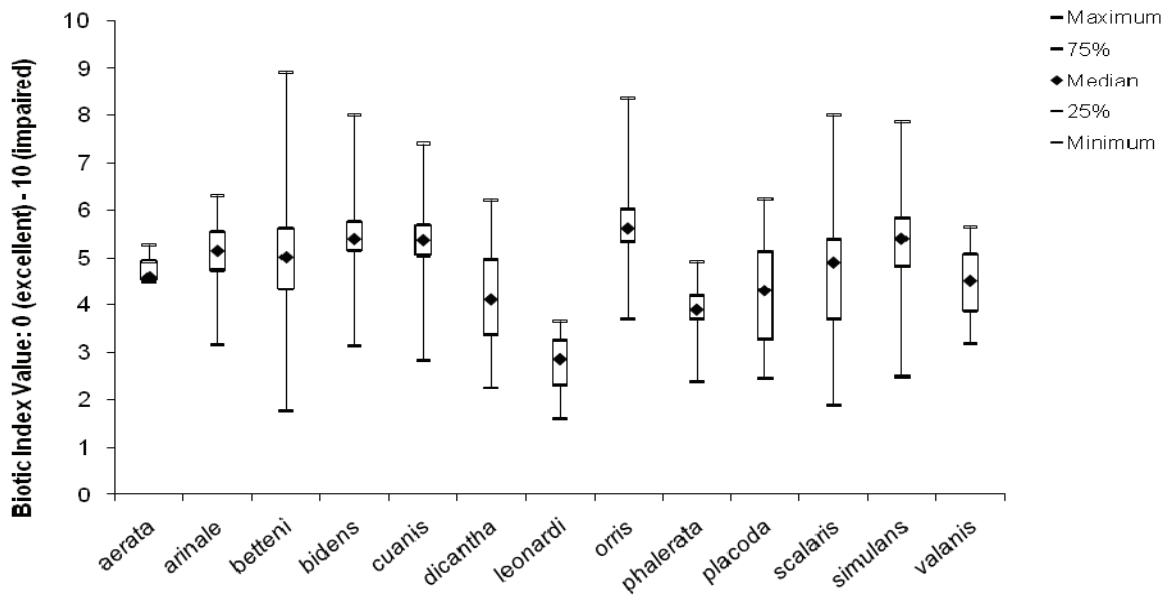
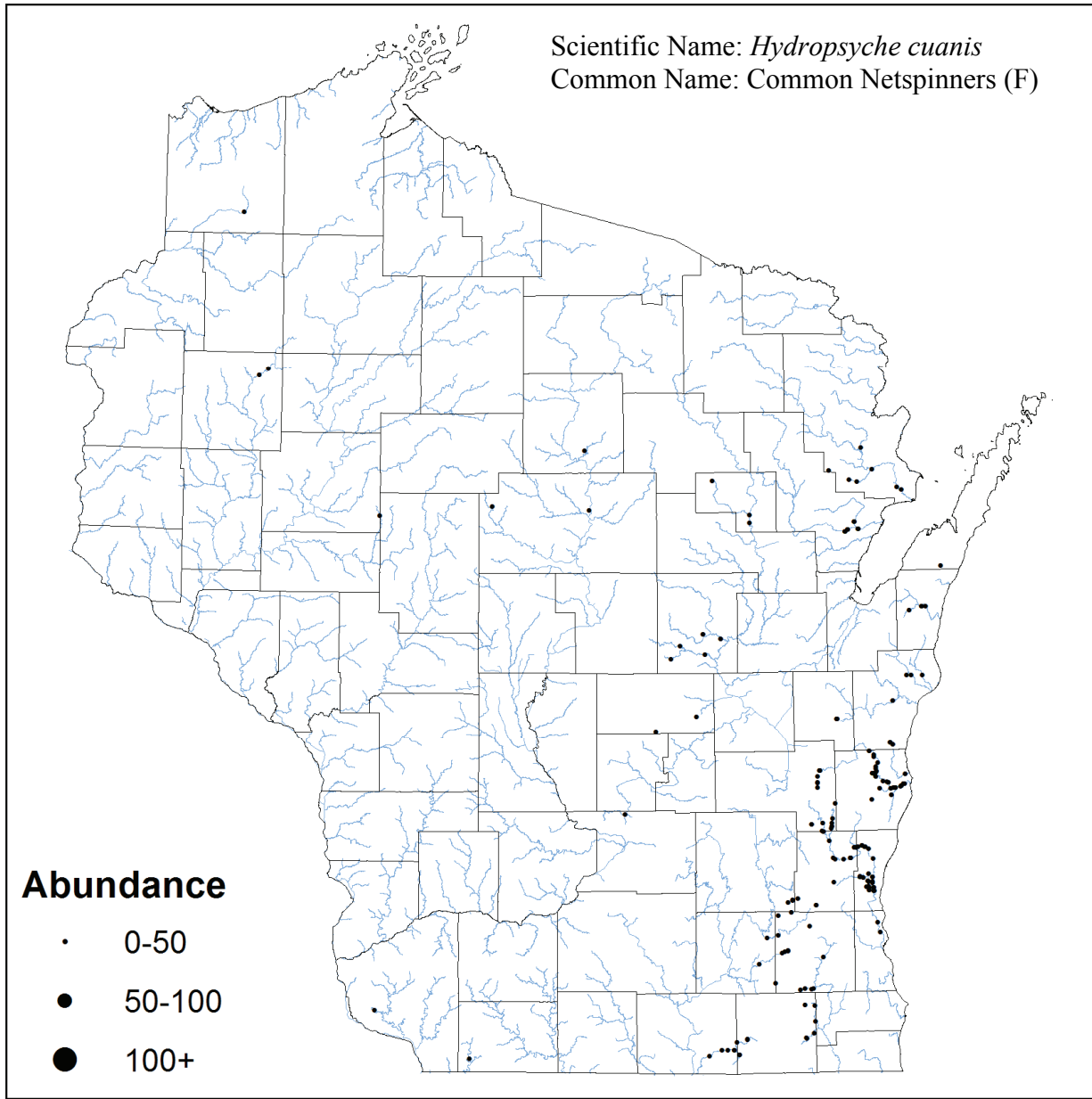
# Trichoptera Hydropsychidae



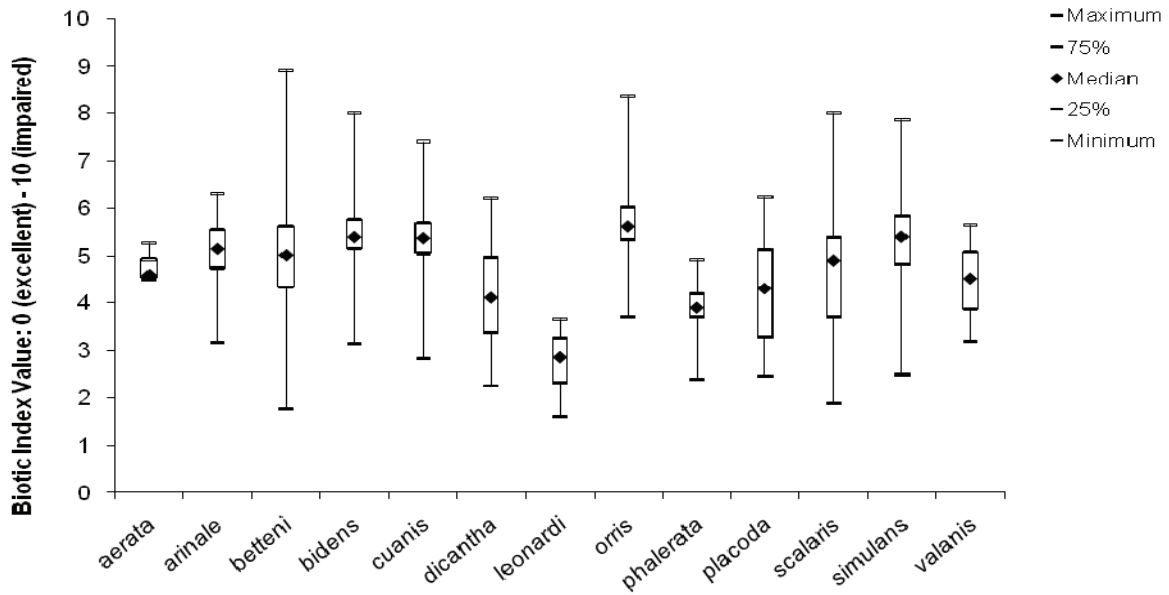
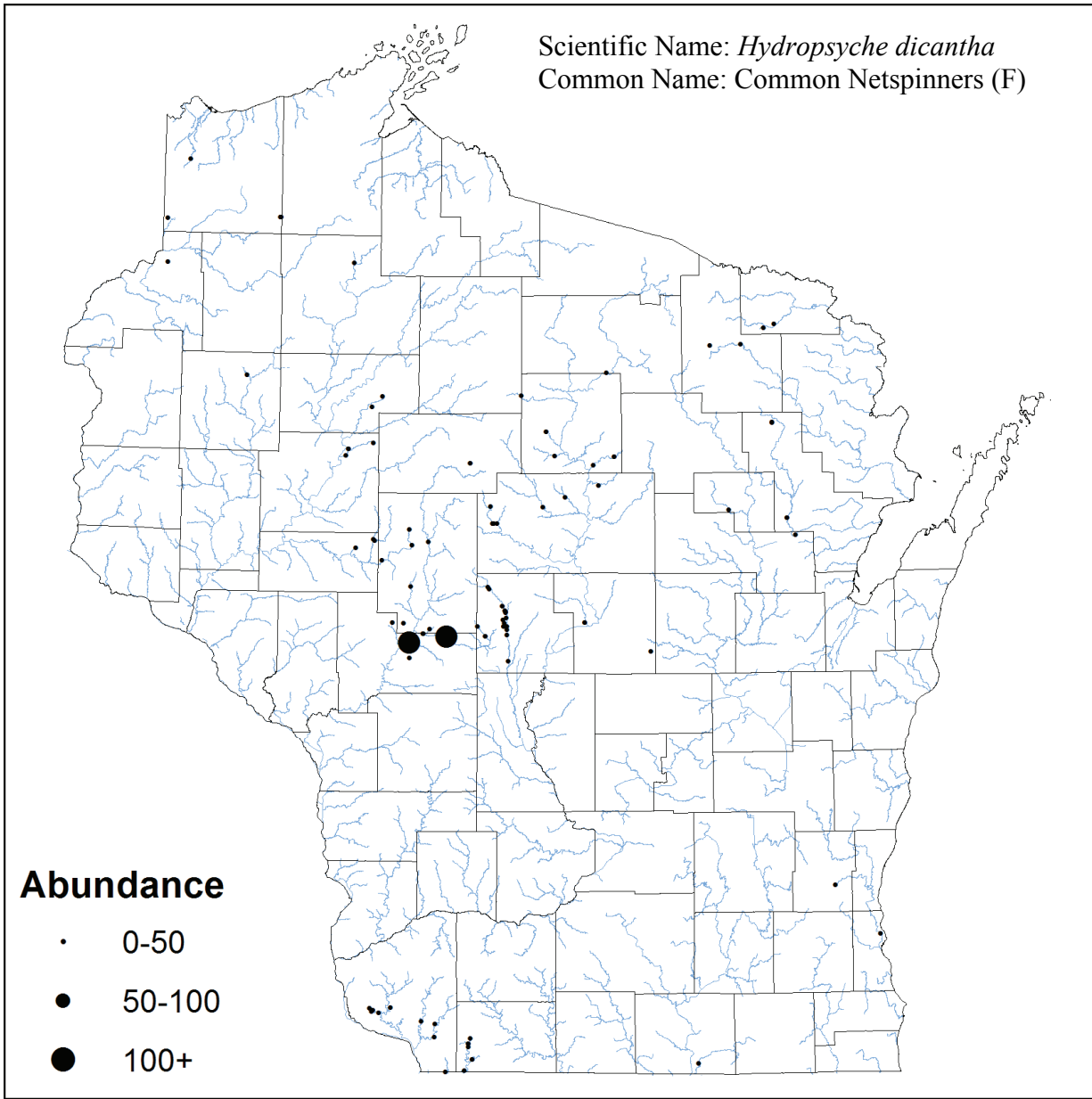
# Trichoptera Hydropsychidae



# Trichoptera Hydropsychidae



# Trichoptera Hydropsychidae

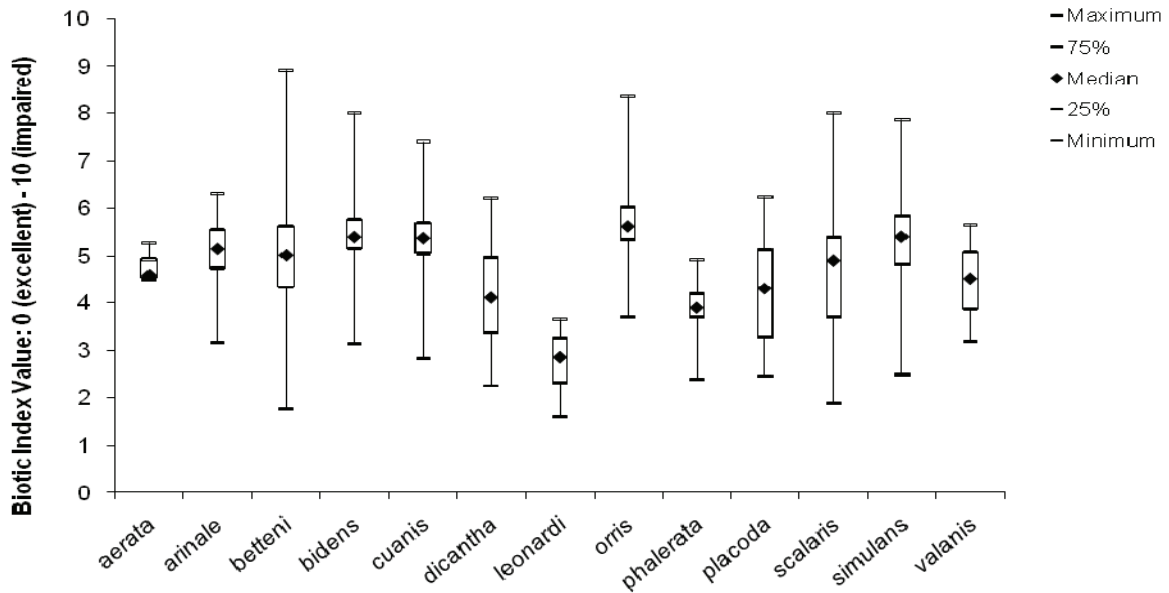
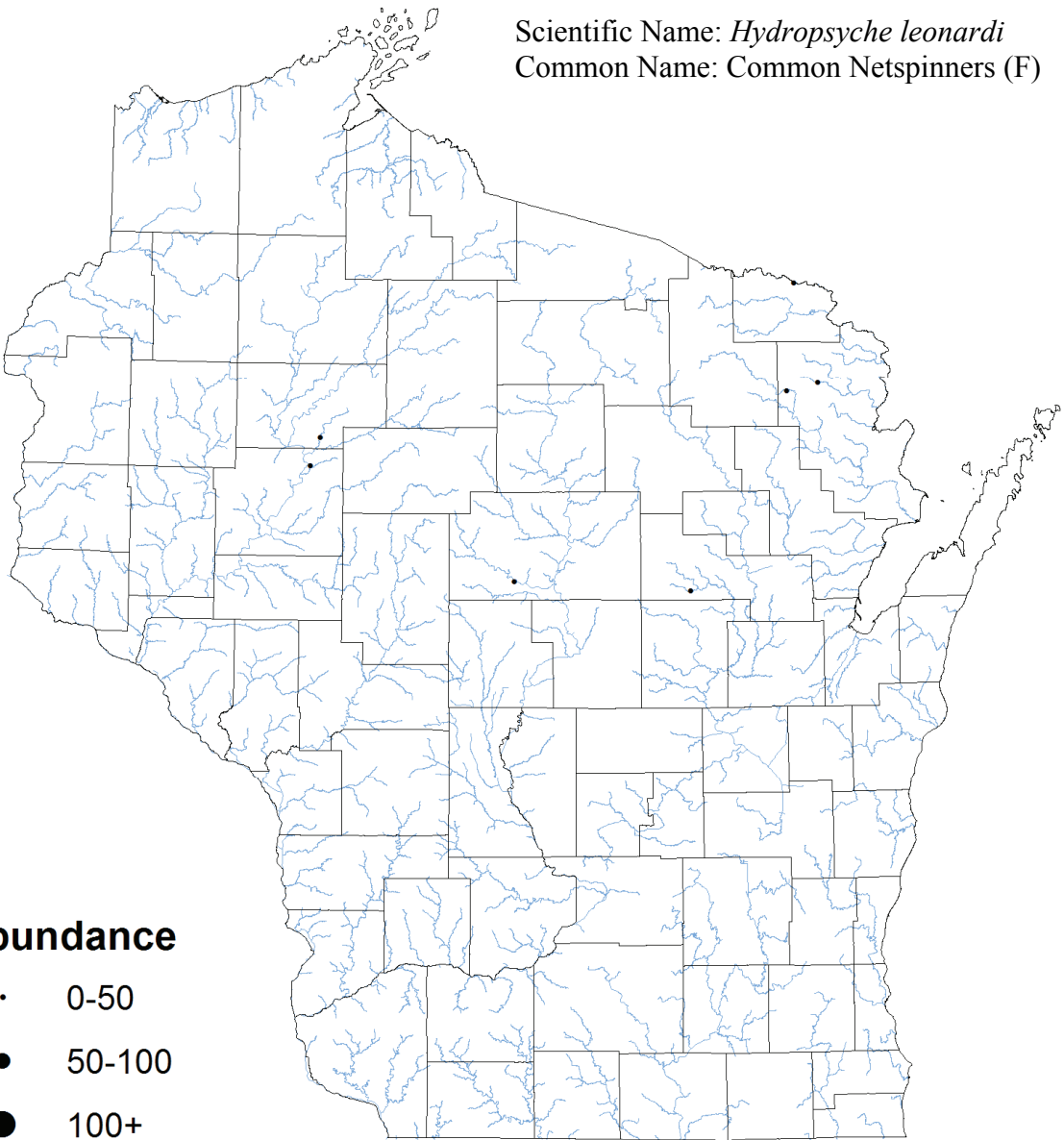


# Trichoptera Hydropsychidae

Scientific Name: *Hydropsyche leonardi*  
 Common Name: Common Netspinners (F)

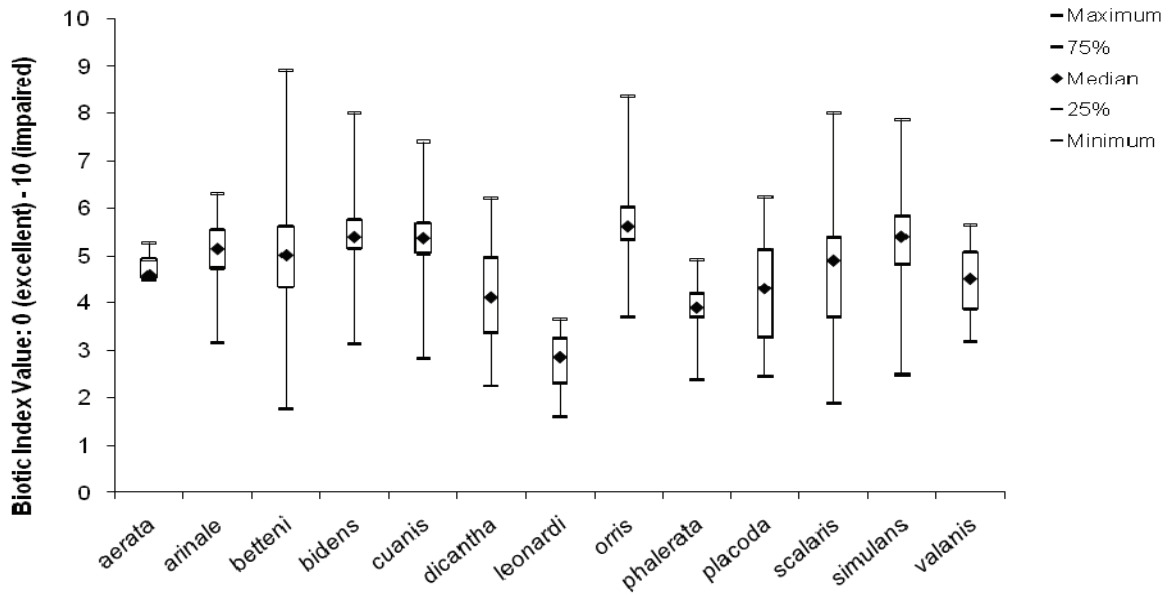
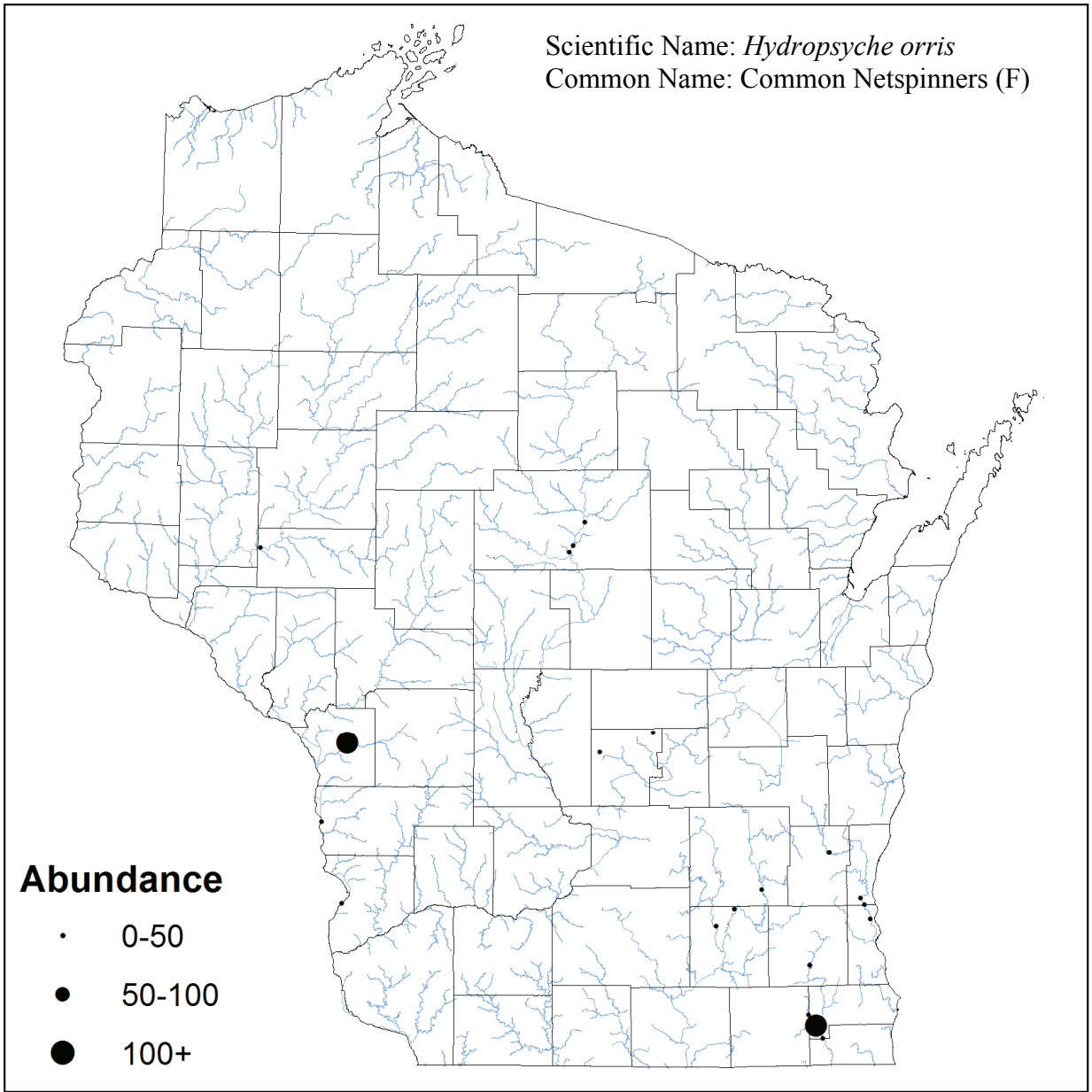
## Abundance

- 0-50
- 50-100
- 100+

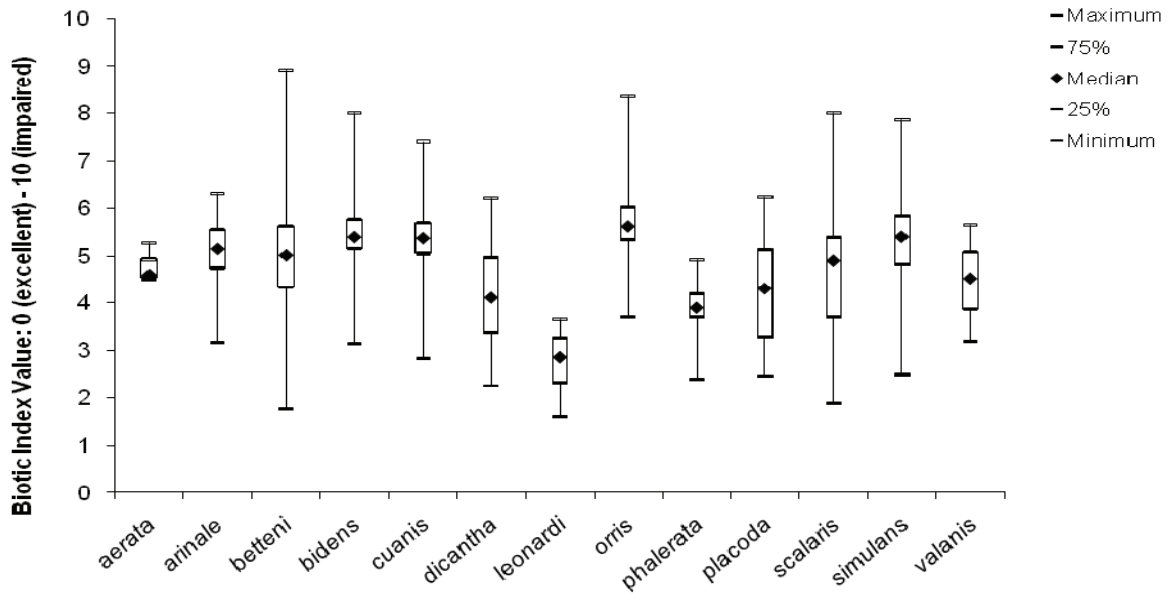
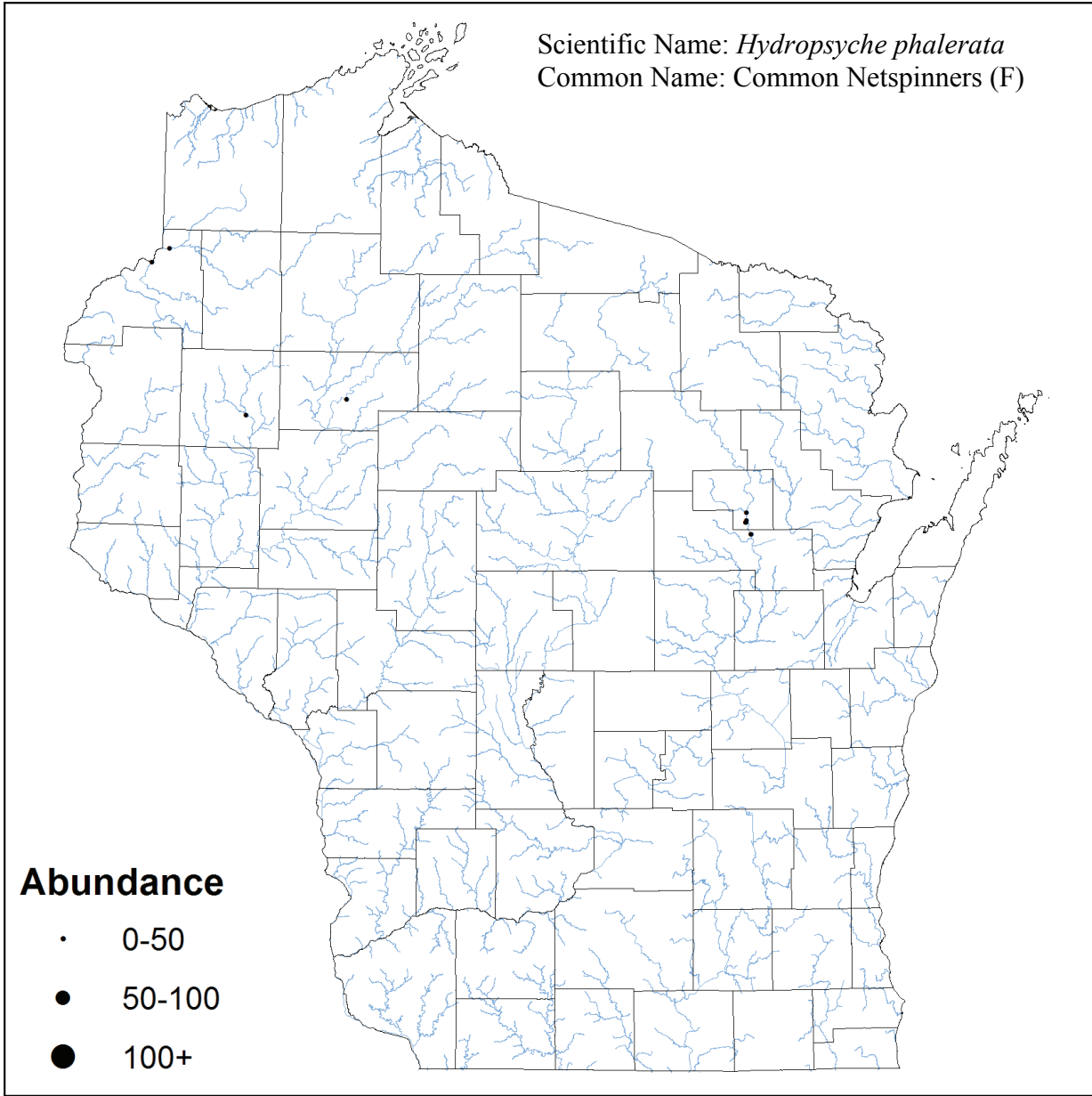




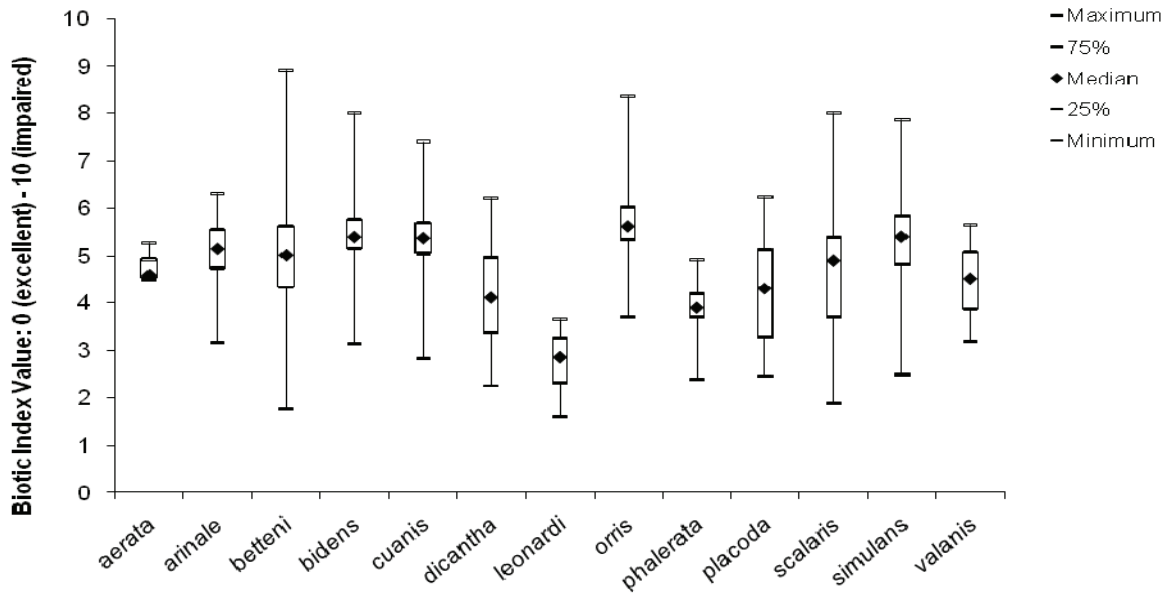
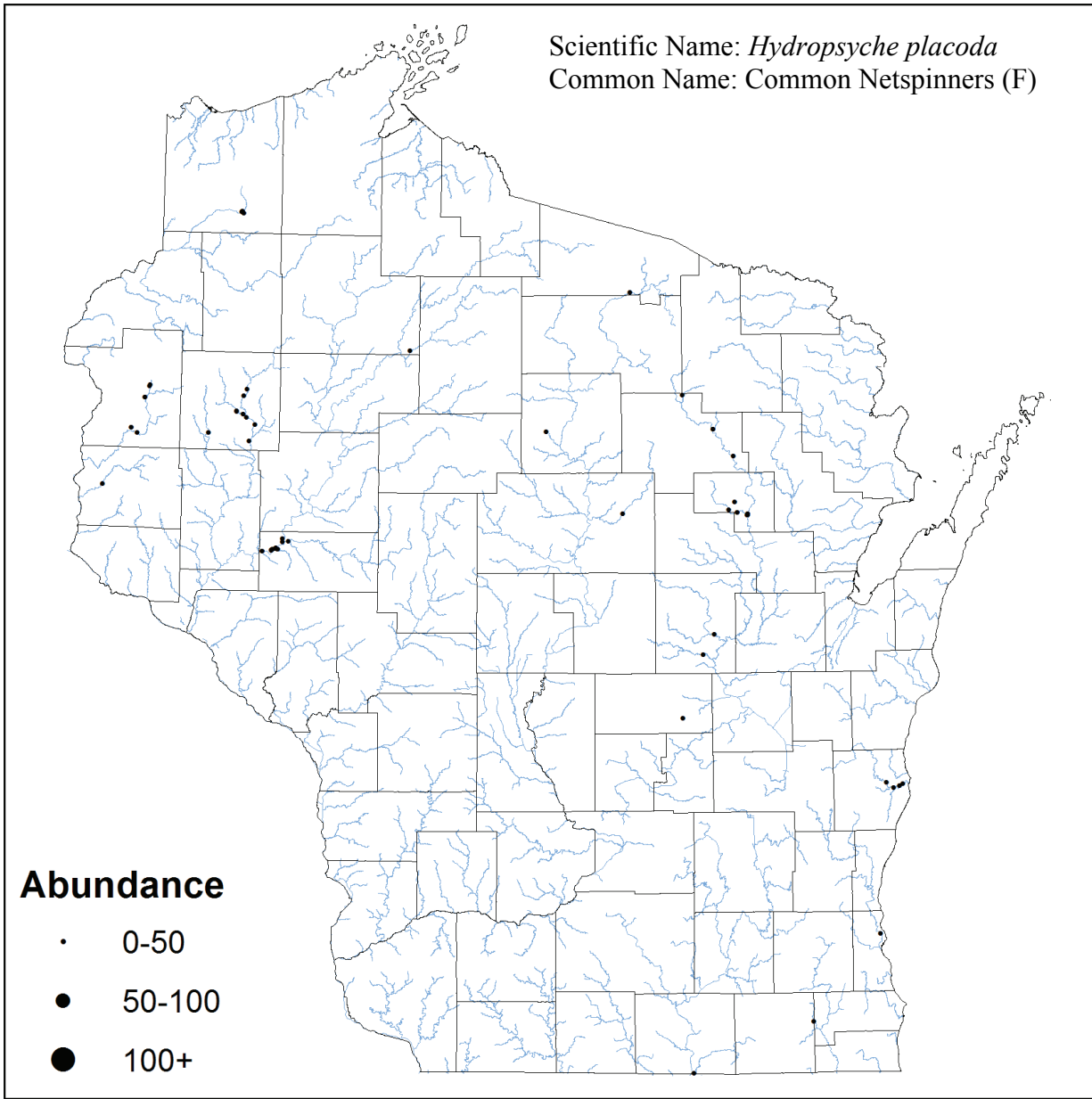
# Trichoptera Hydropsychidae



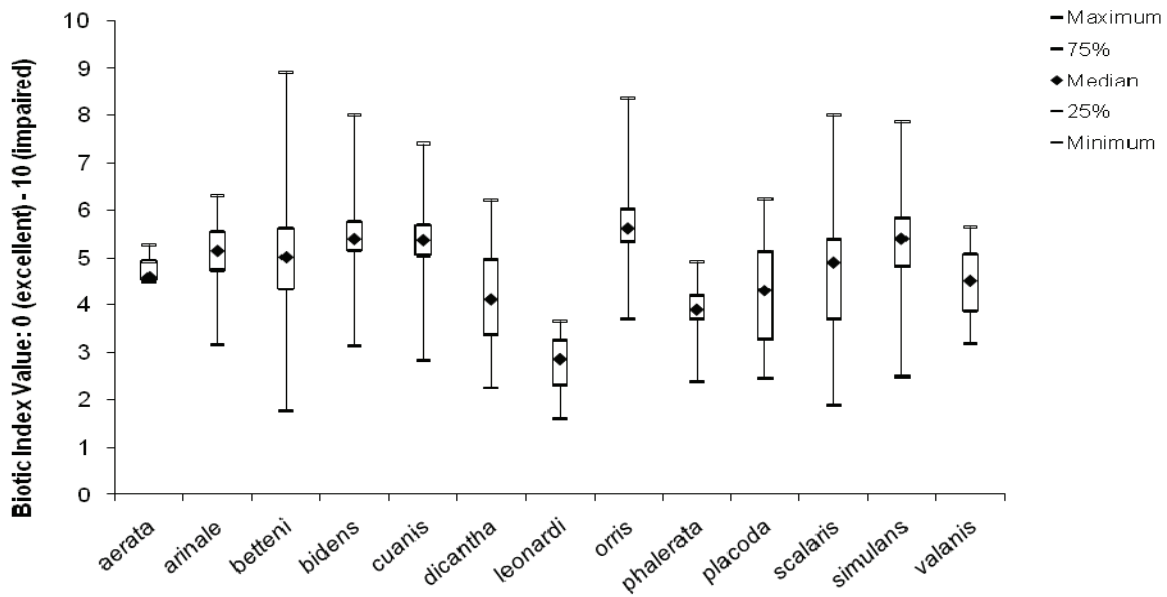
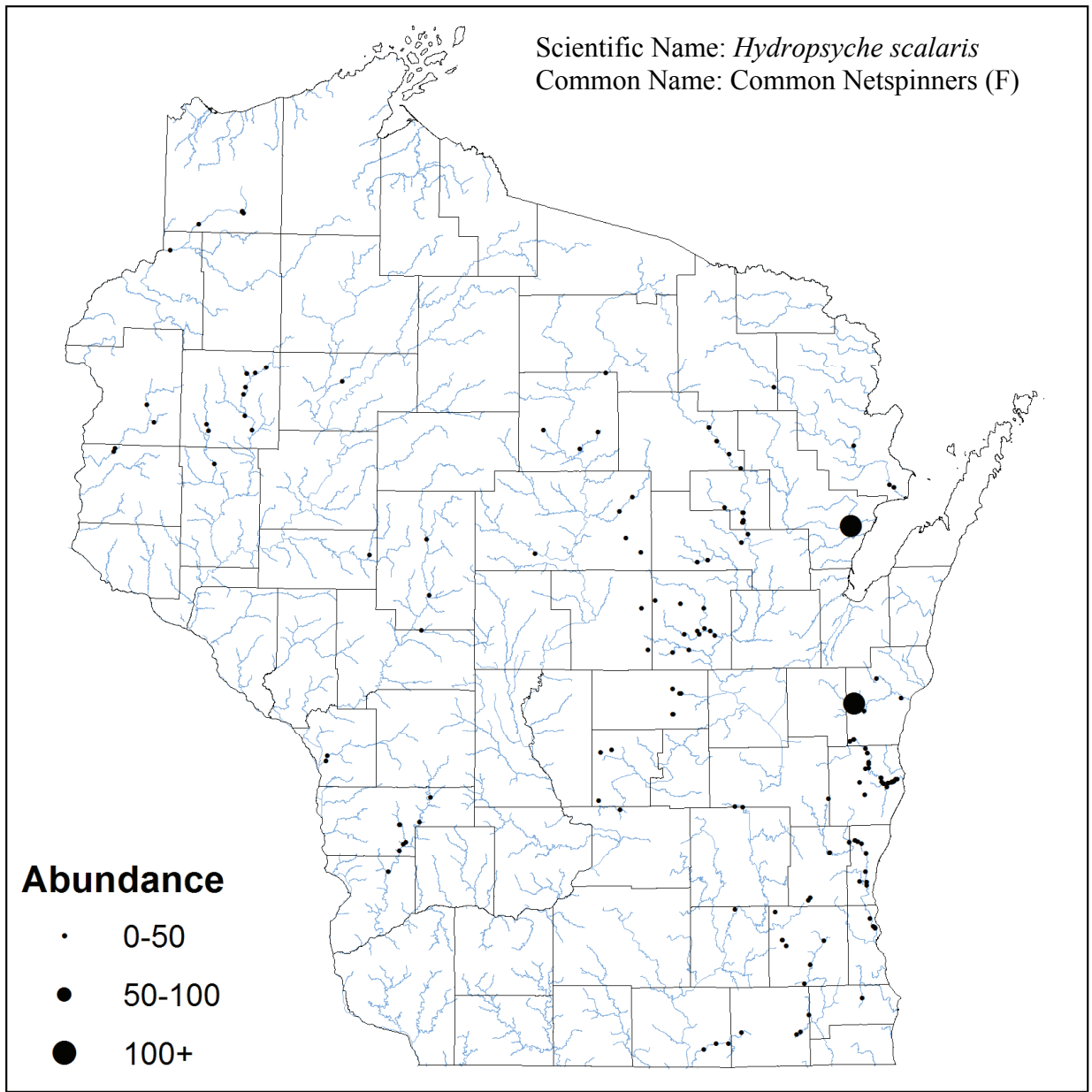
# Trichoptera Hydropsychidae



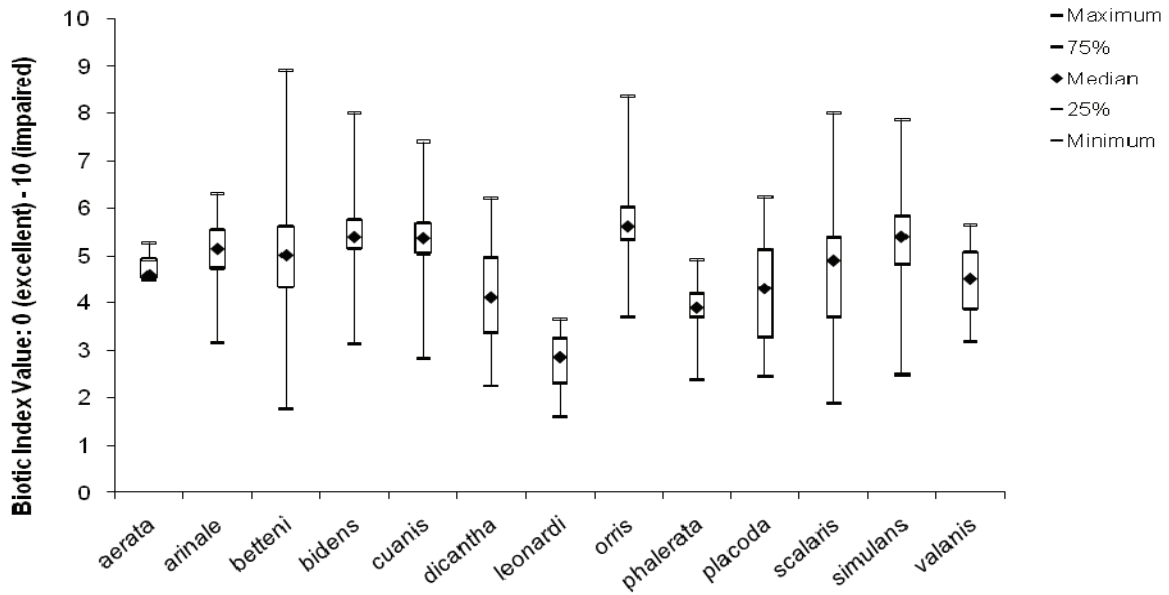
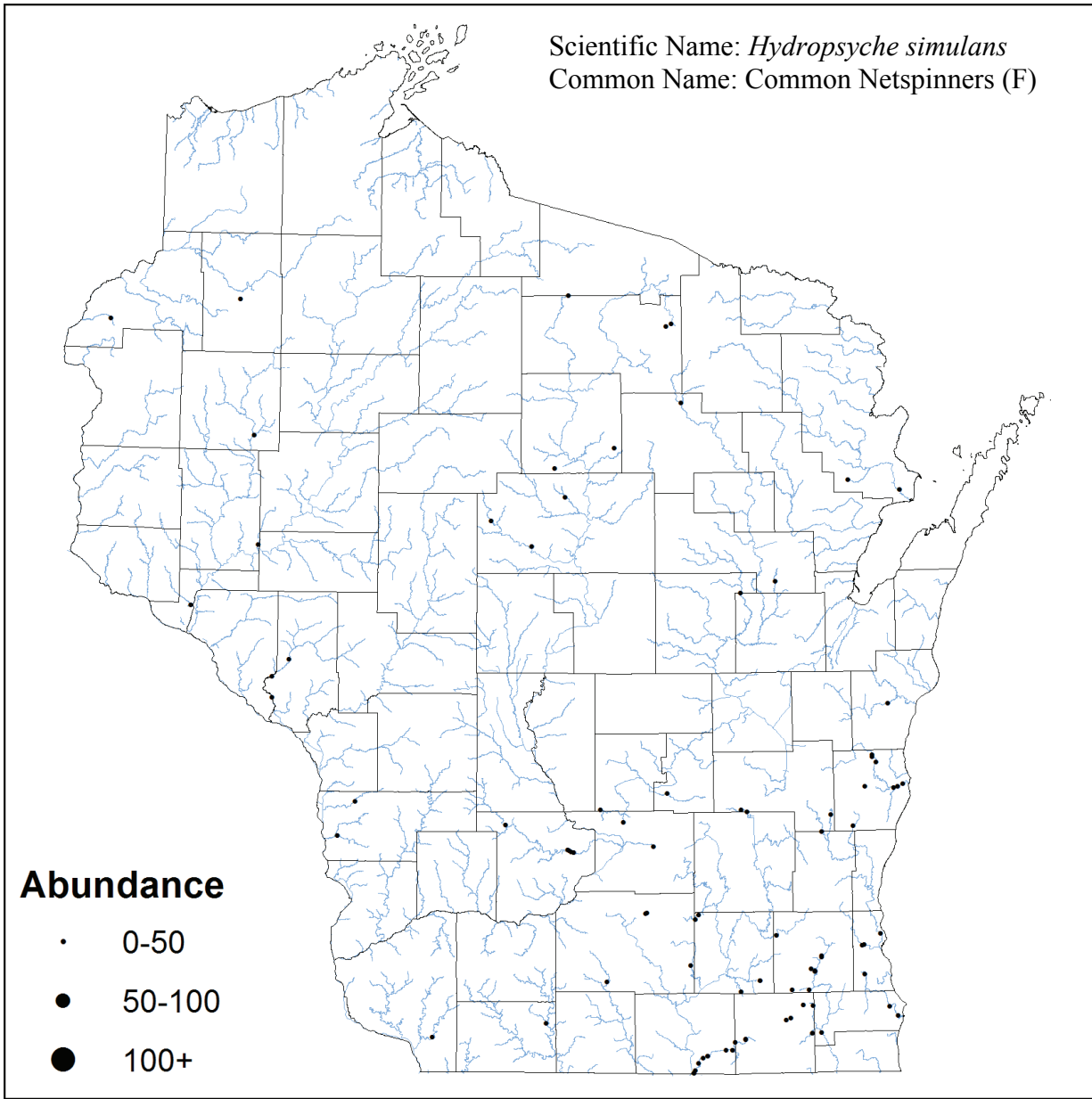
# Trichoptera Hydropsychidae



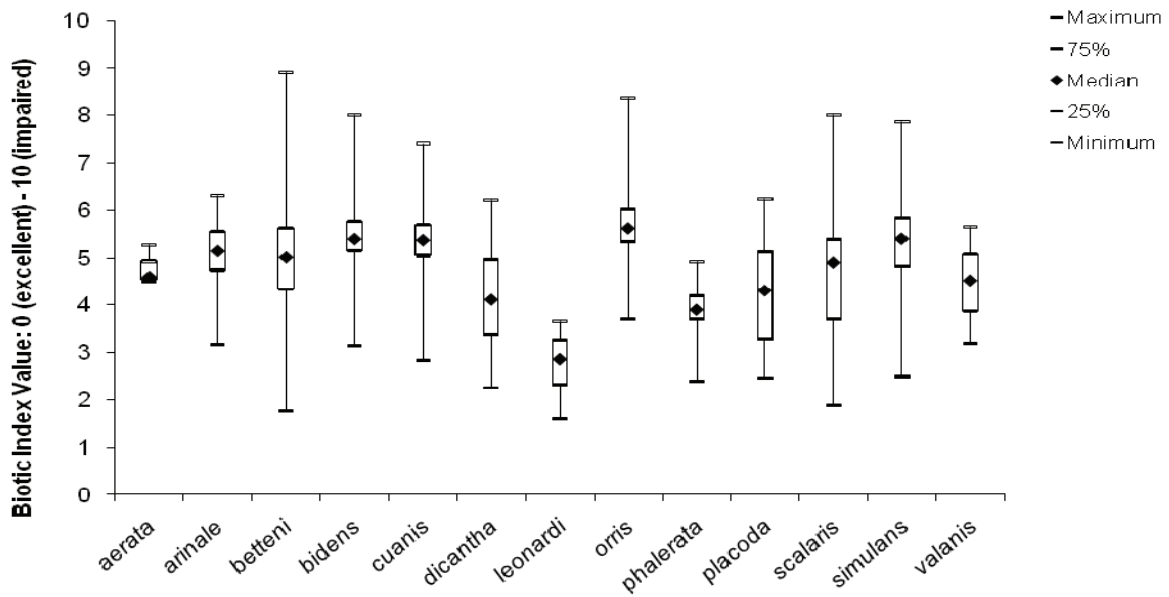
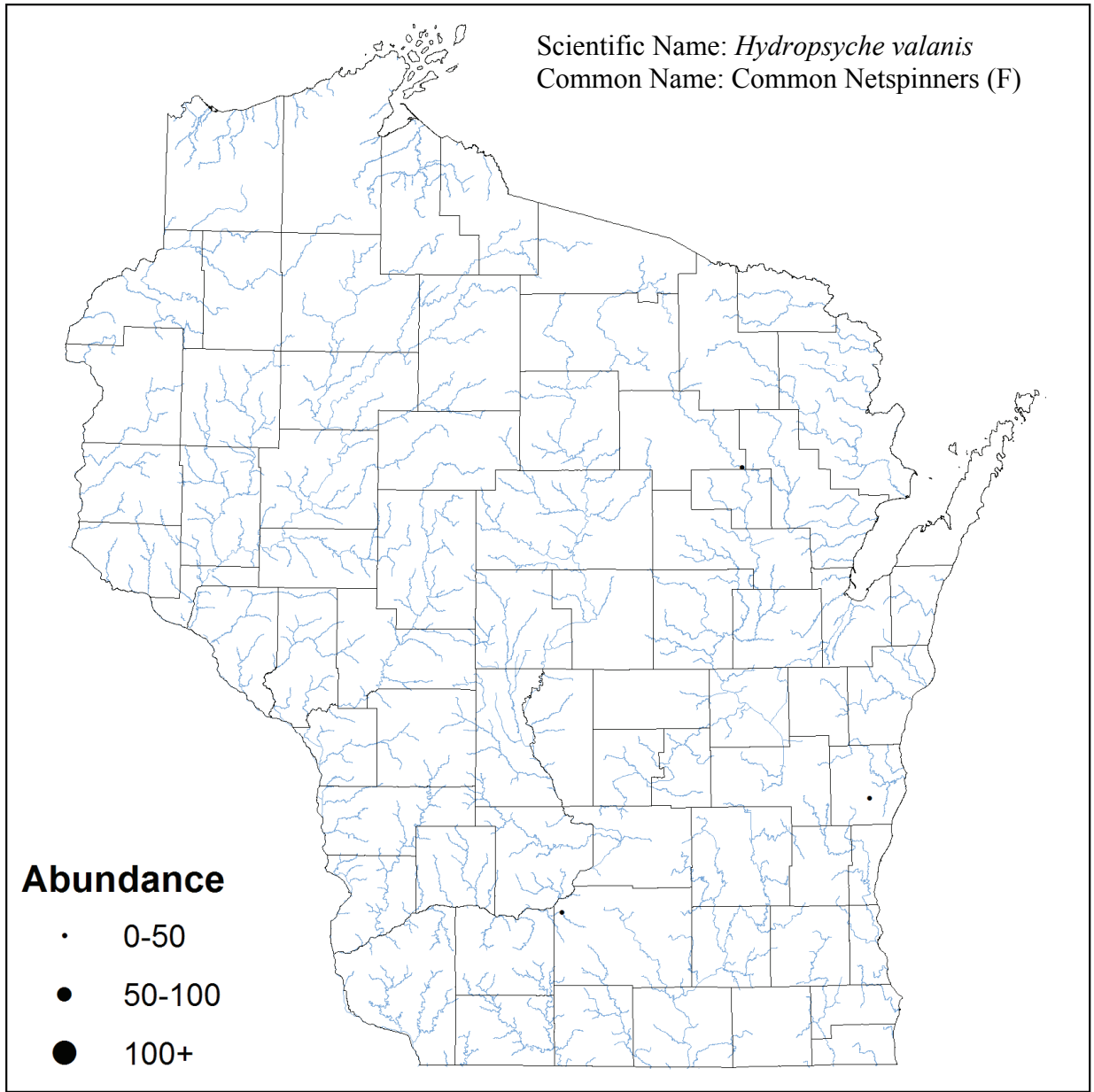
# Trichoptera Hydropsychidae



# Trichoptera Hydropsychidae

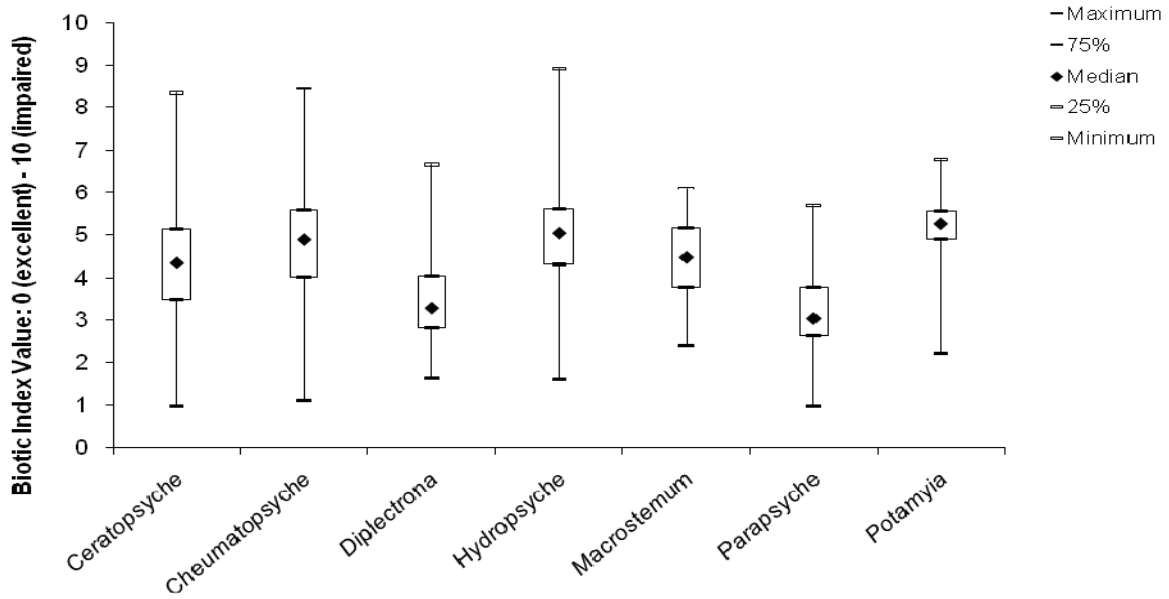
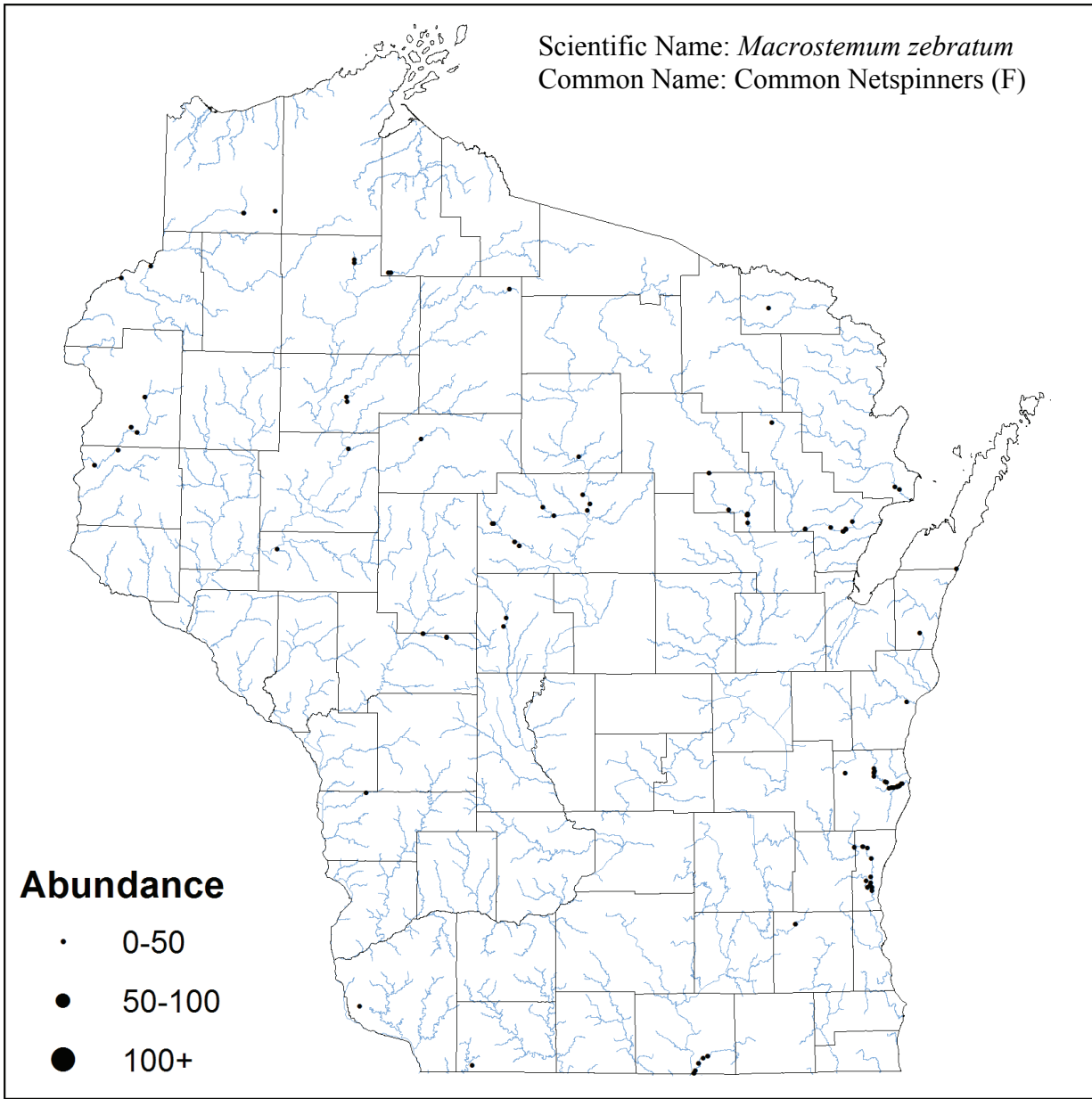


# Trichoptera Hydropsychidae



# Trichoptera Hydropsychidae

Scientific Name: *Macrostemum zebratum*  
 Common Name: Common Netspinners (F)

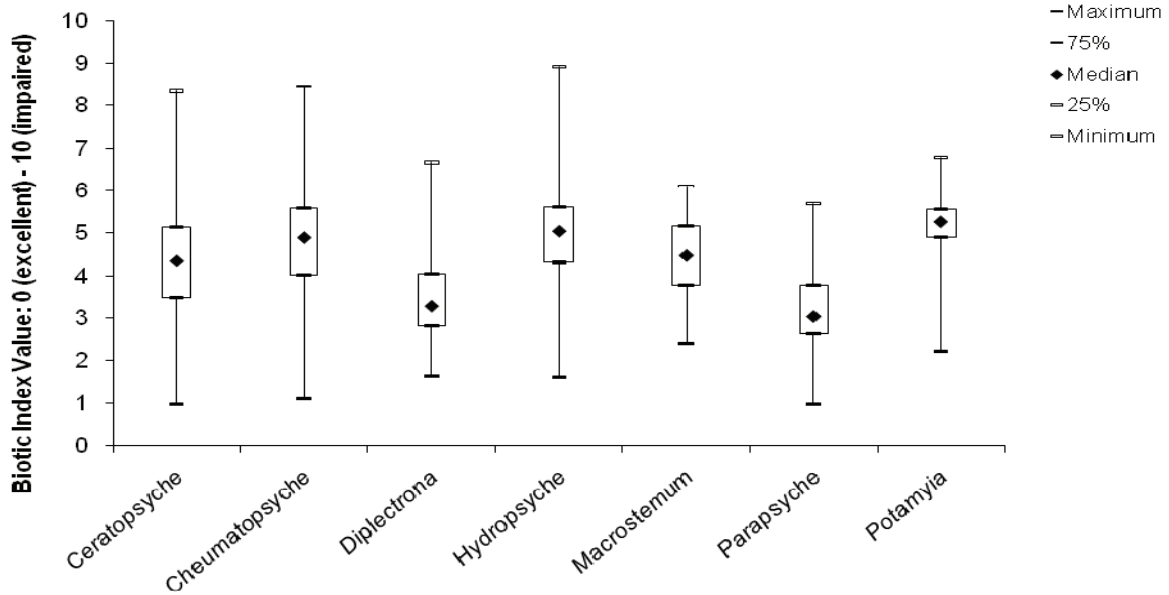
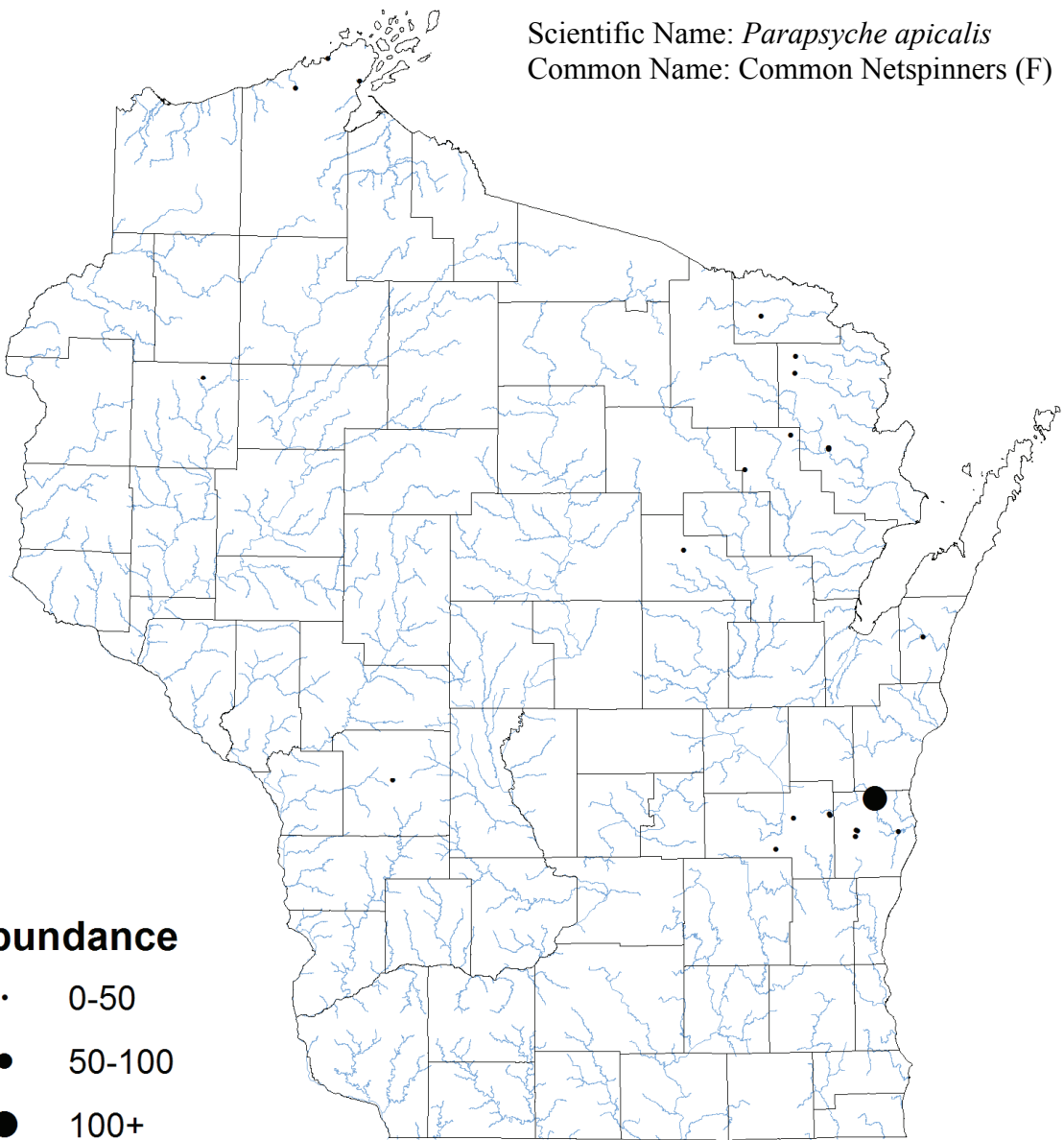


# Trichoptera Hydropsychidae

Scientific Name: *Parapsyche apicalis*  
 Common Name: Common Netspinners (F)

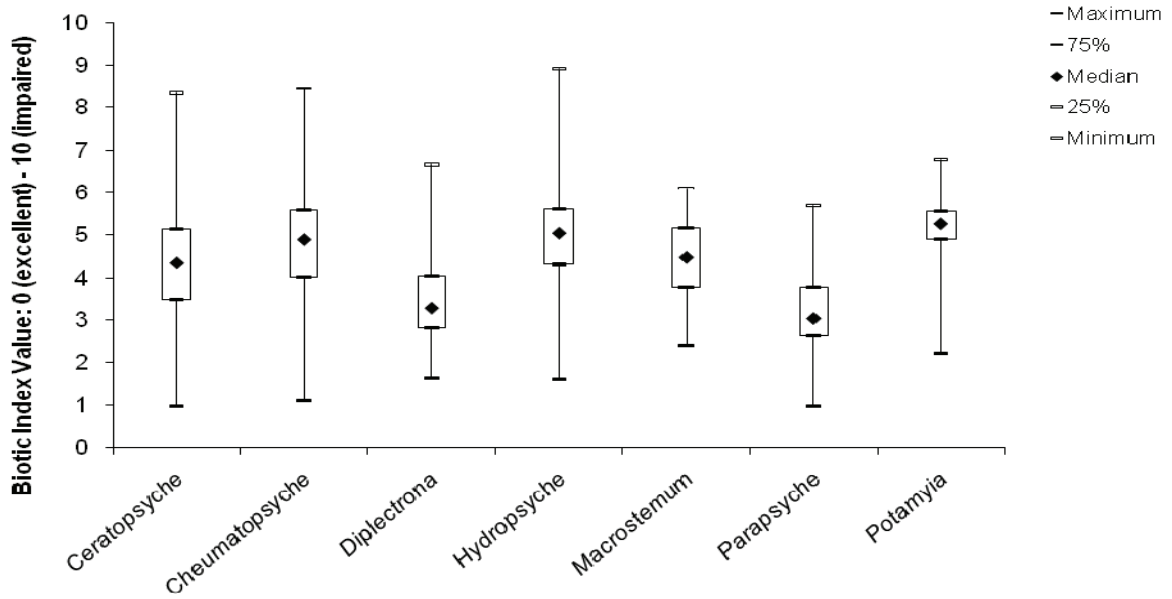
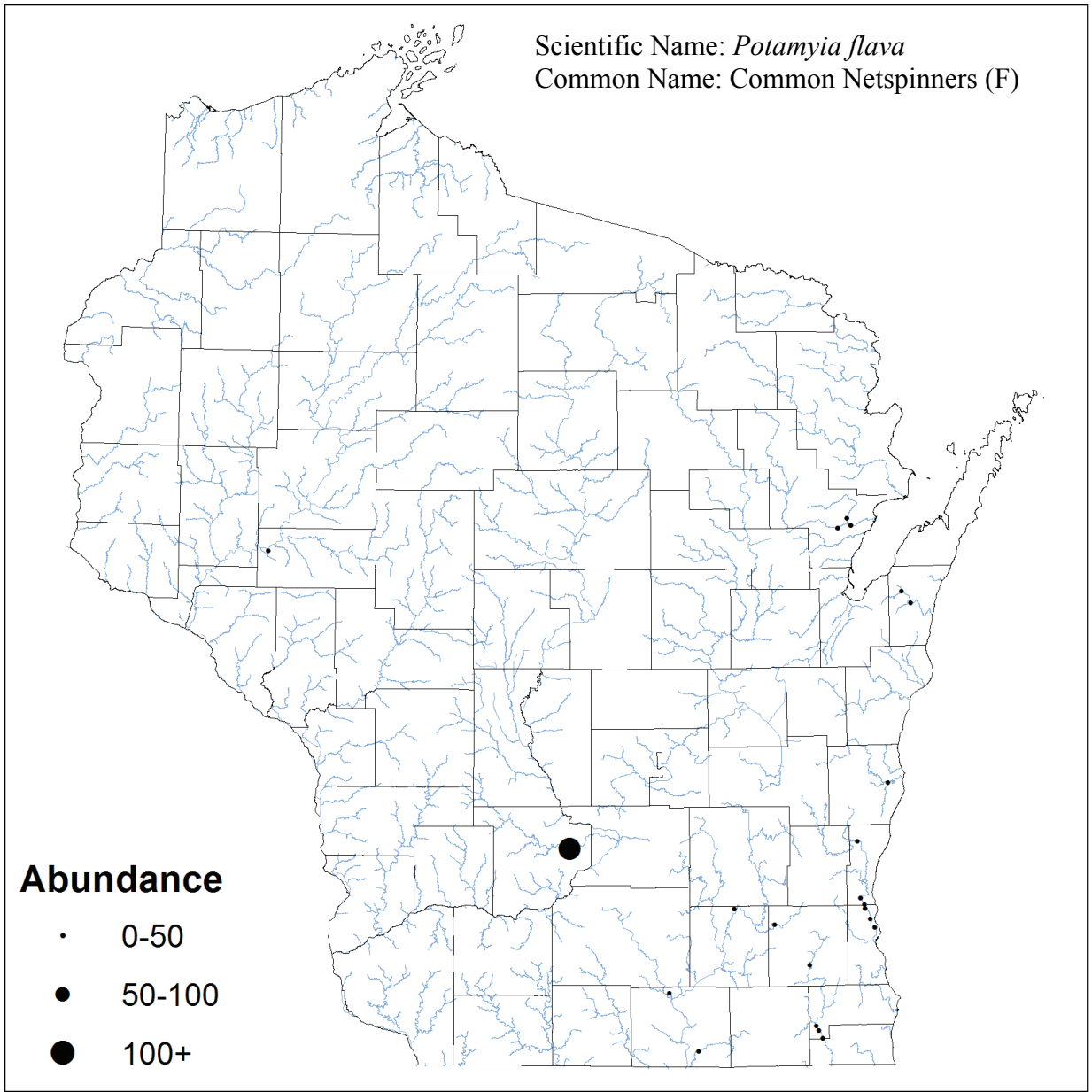
## Abundance

- 0-50
- 50-100
- 100+





# Trichoptera Hydropsychidae

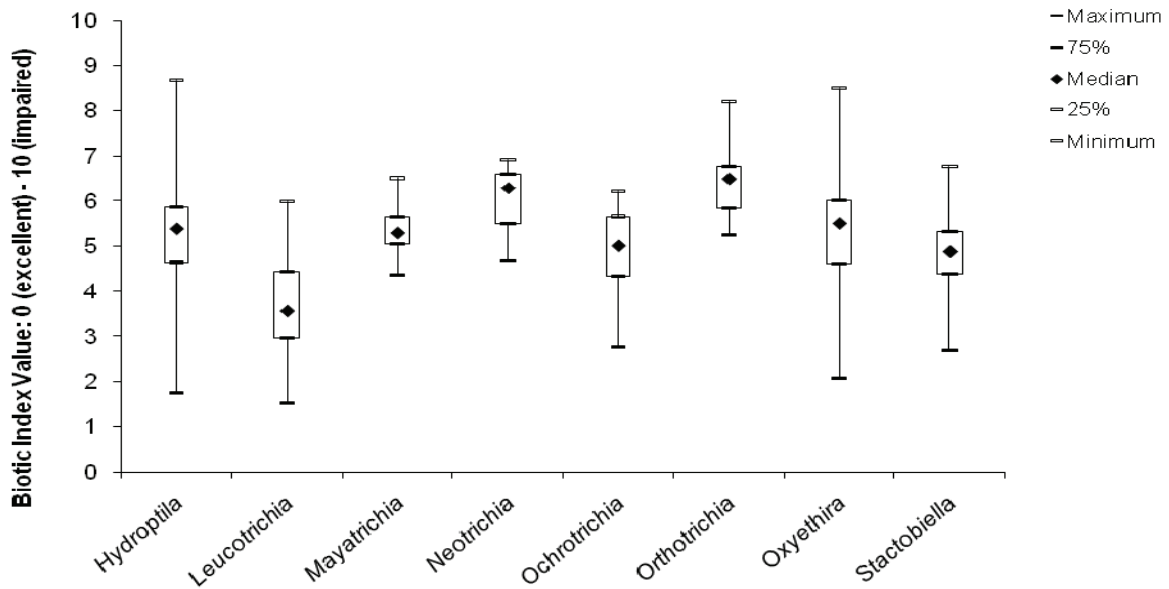
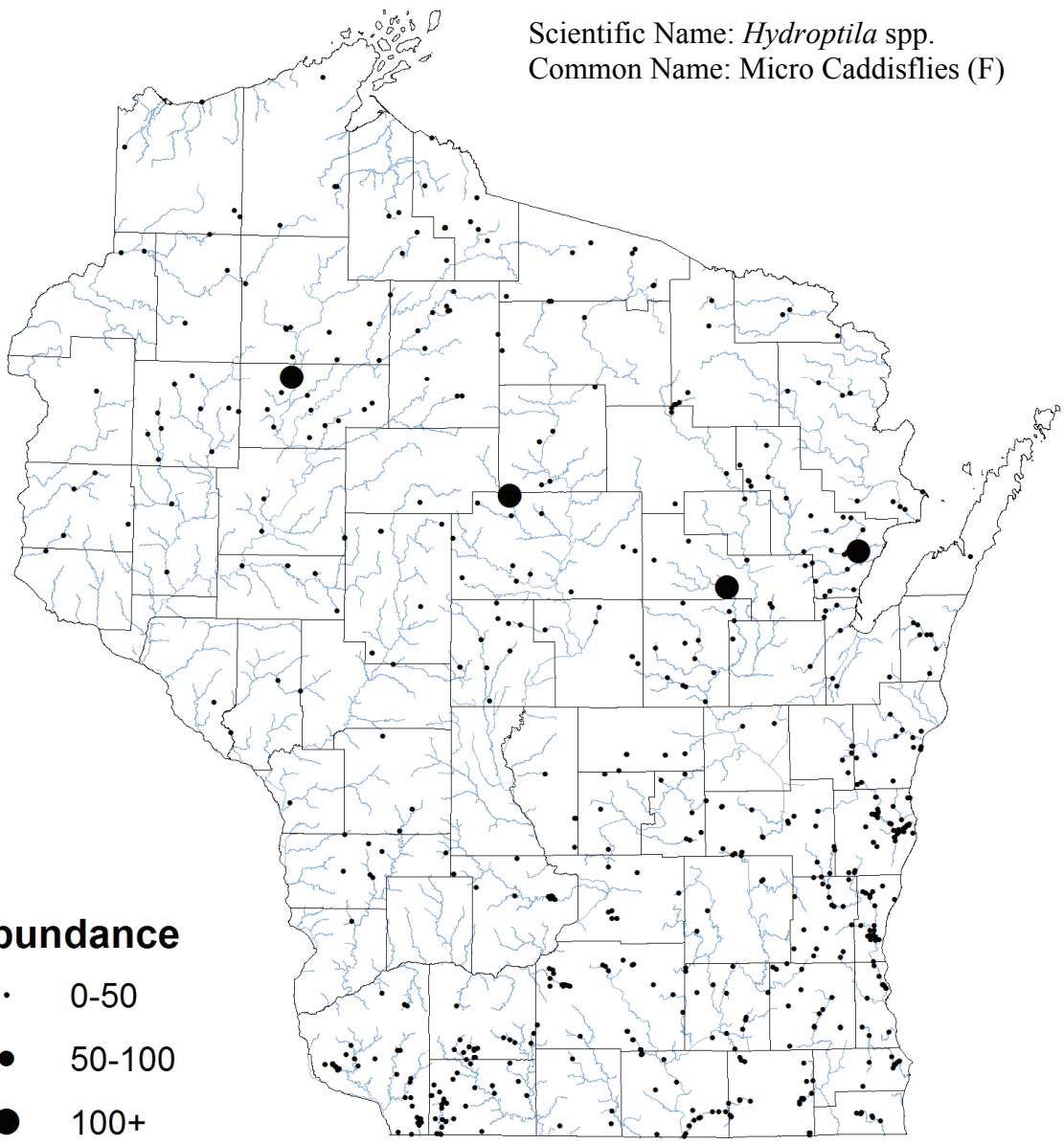


# Trichoptera Hydroptilidae

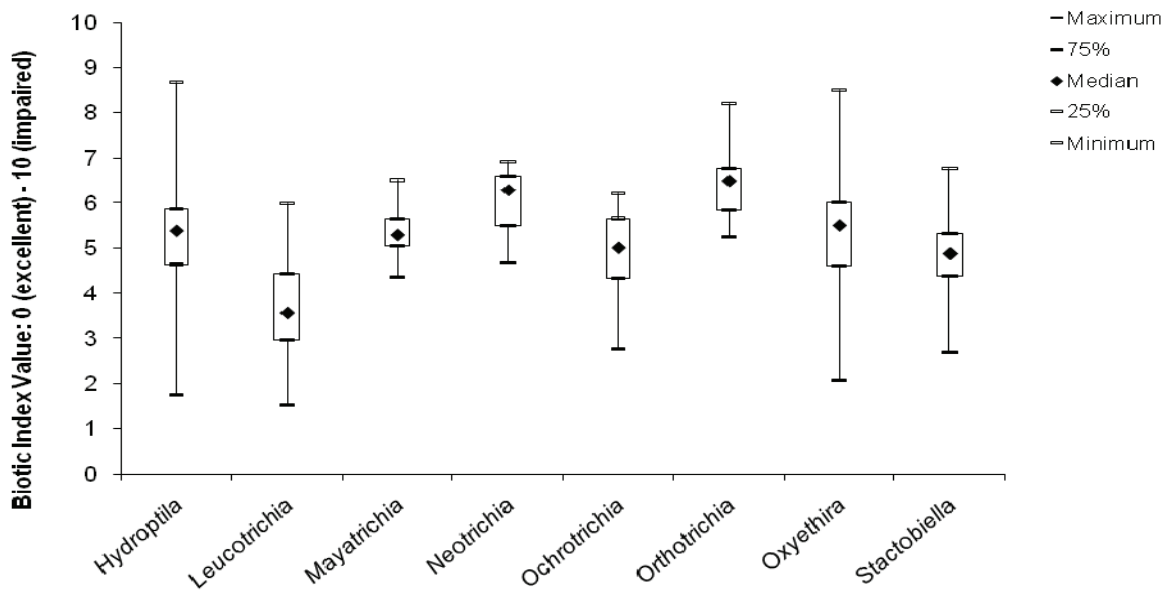
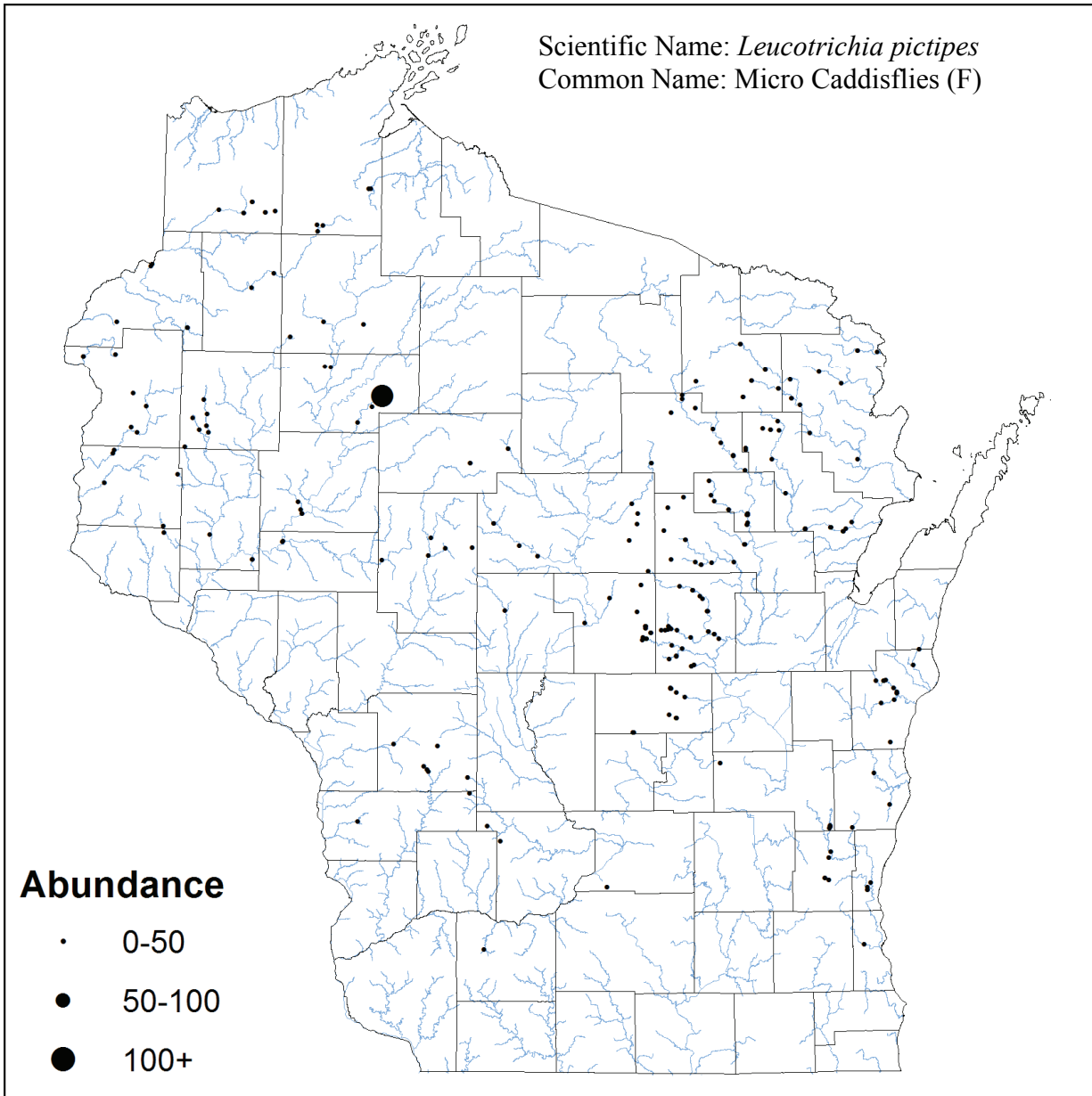
Scientific Name: *Hydroptila* spp.  
 Common Name: Micro Caddisflies (F)

## Abundance

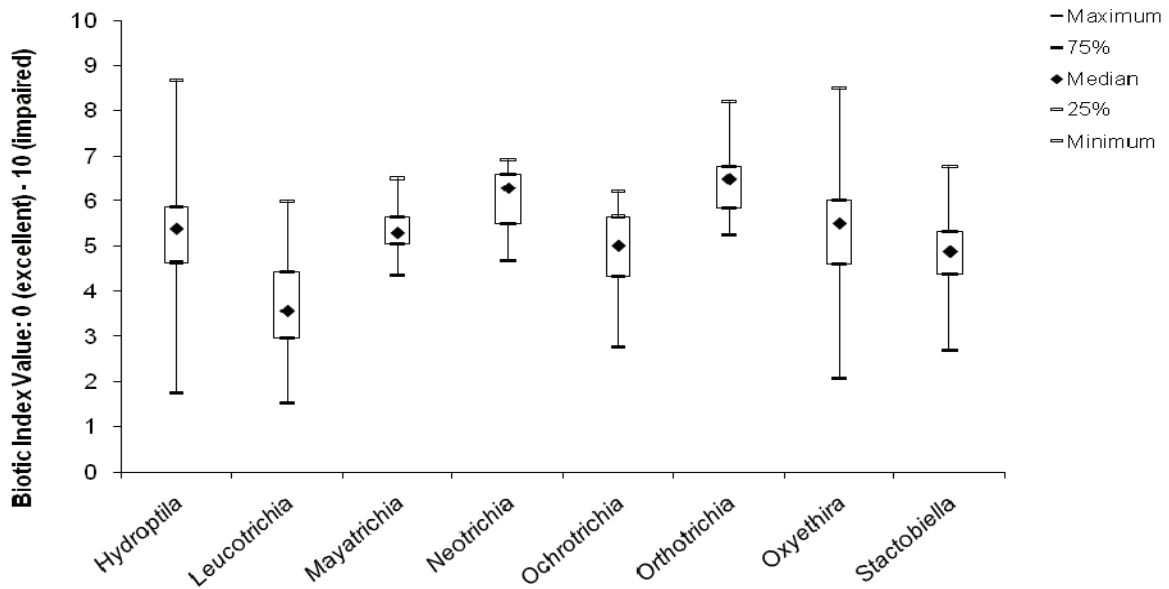
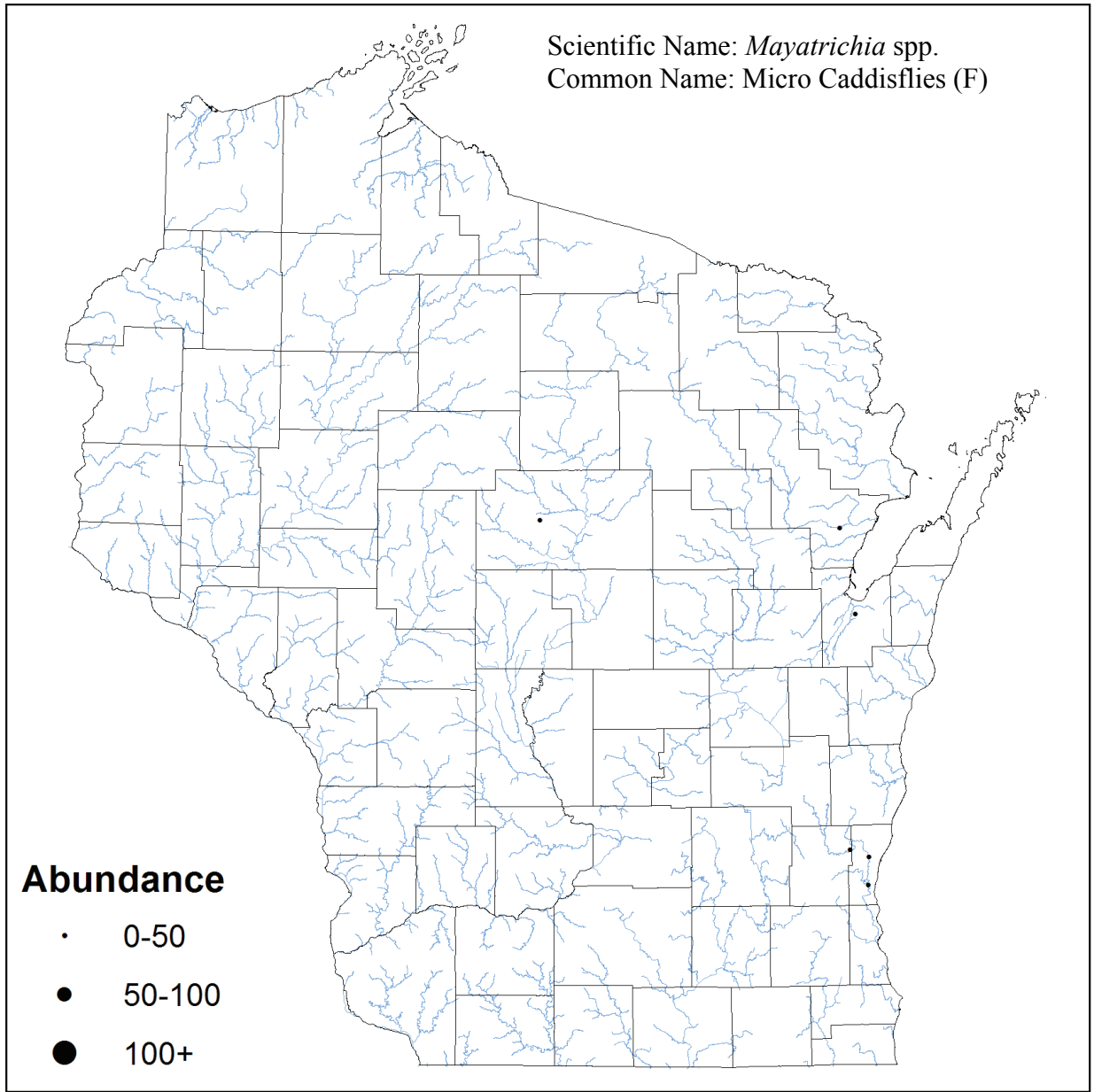
- 0-50
- 50-100
- 100+



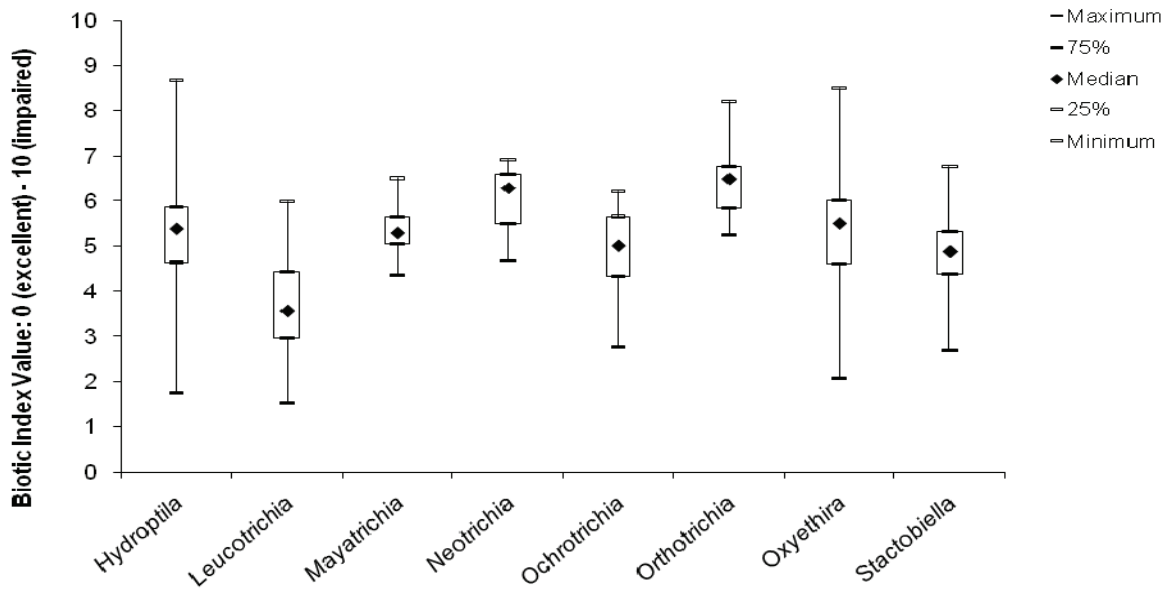
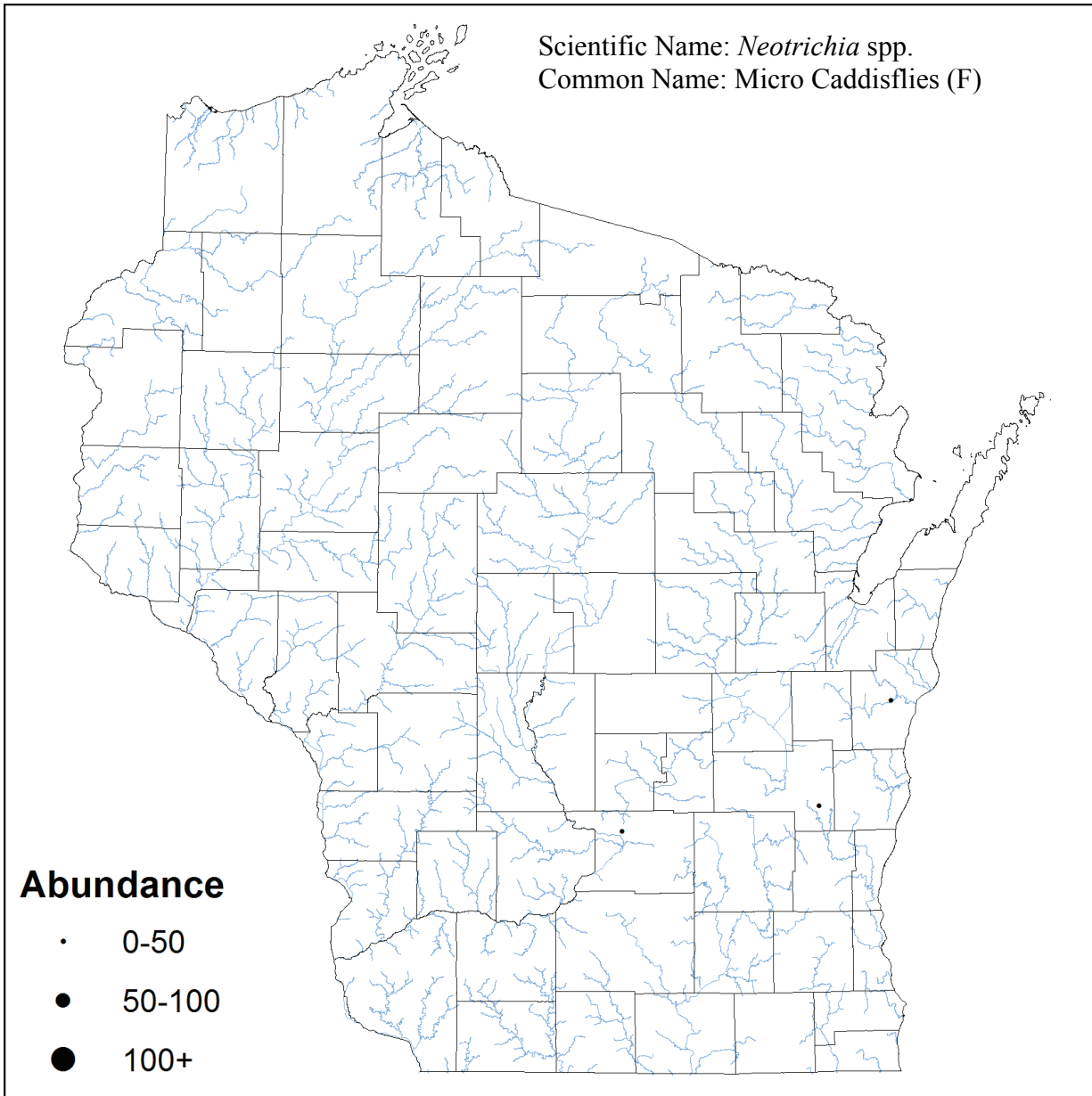
# Trichoptera Hydroptilidae



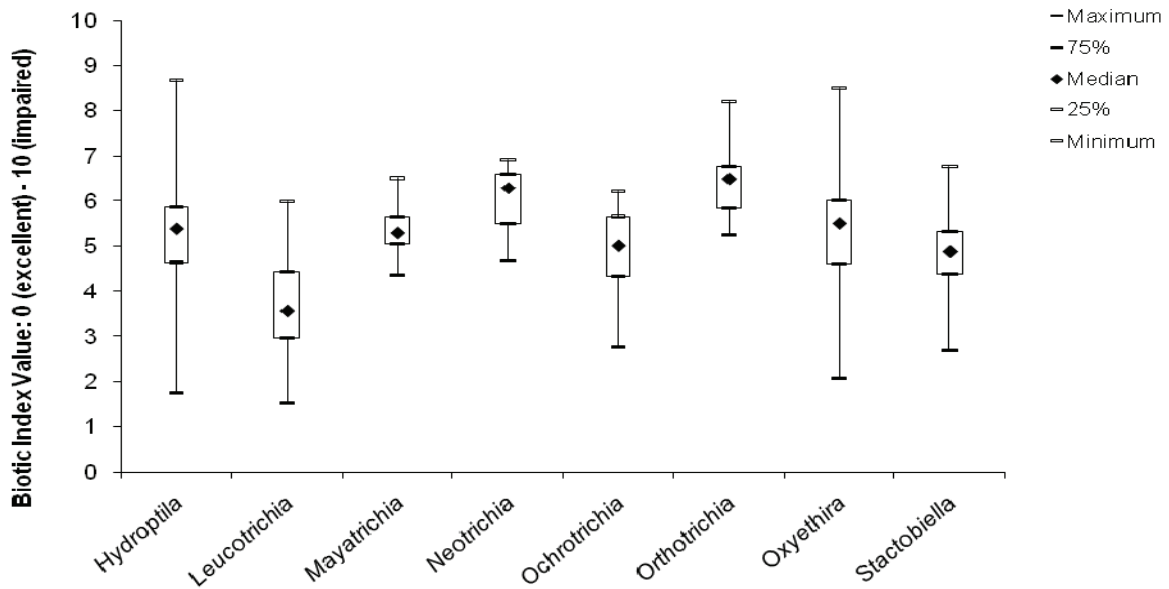
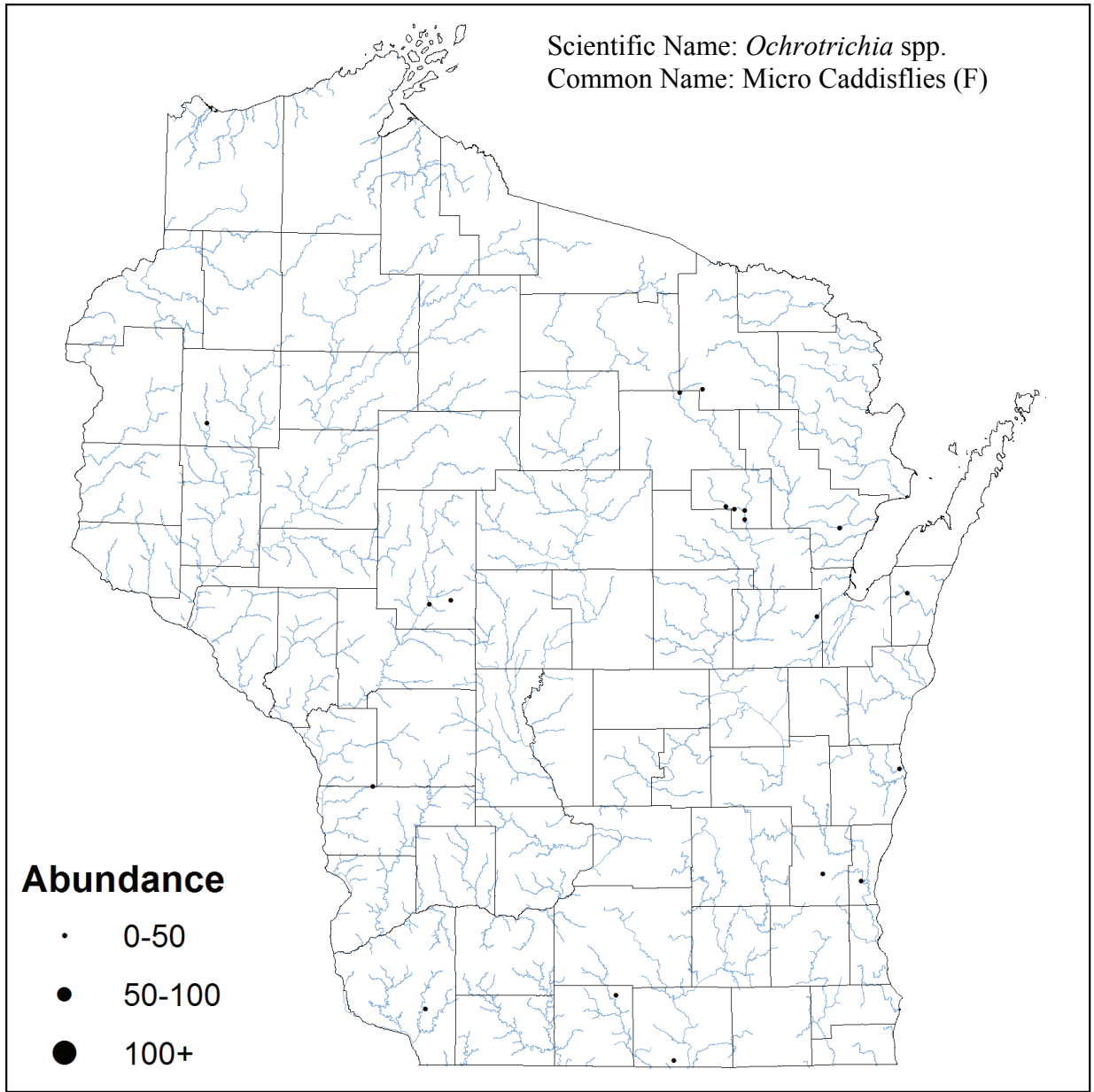
# Trichoptera Hydroptilidae



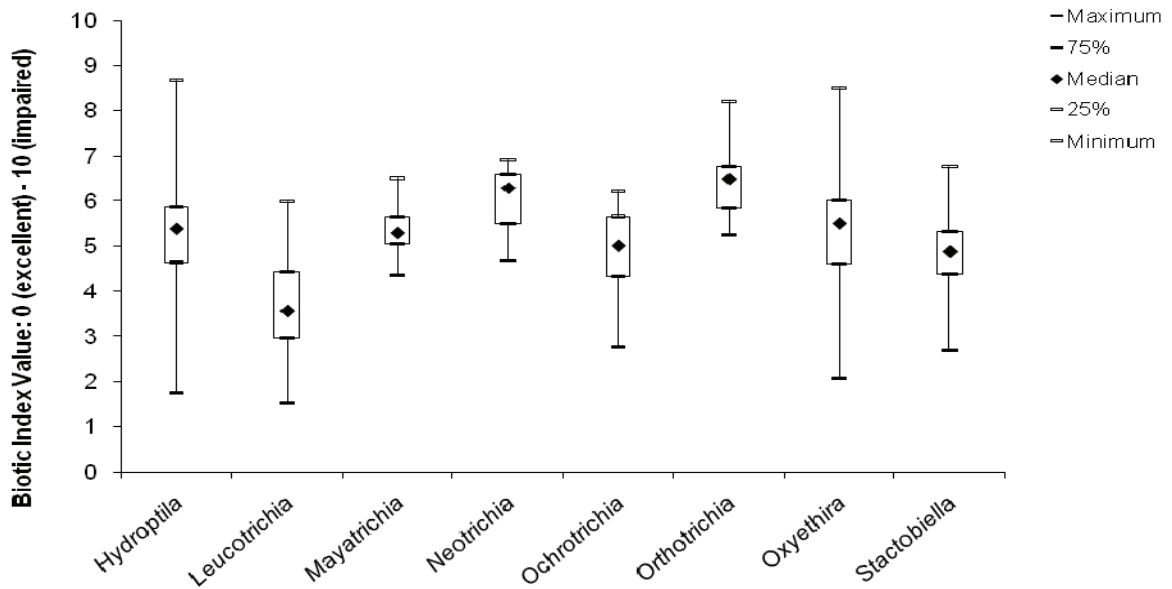
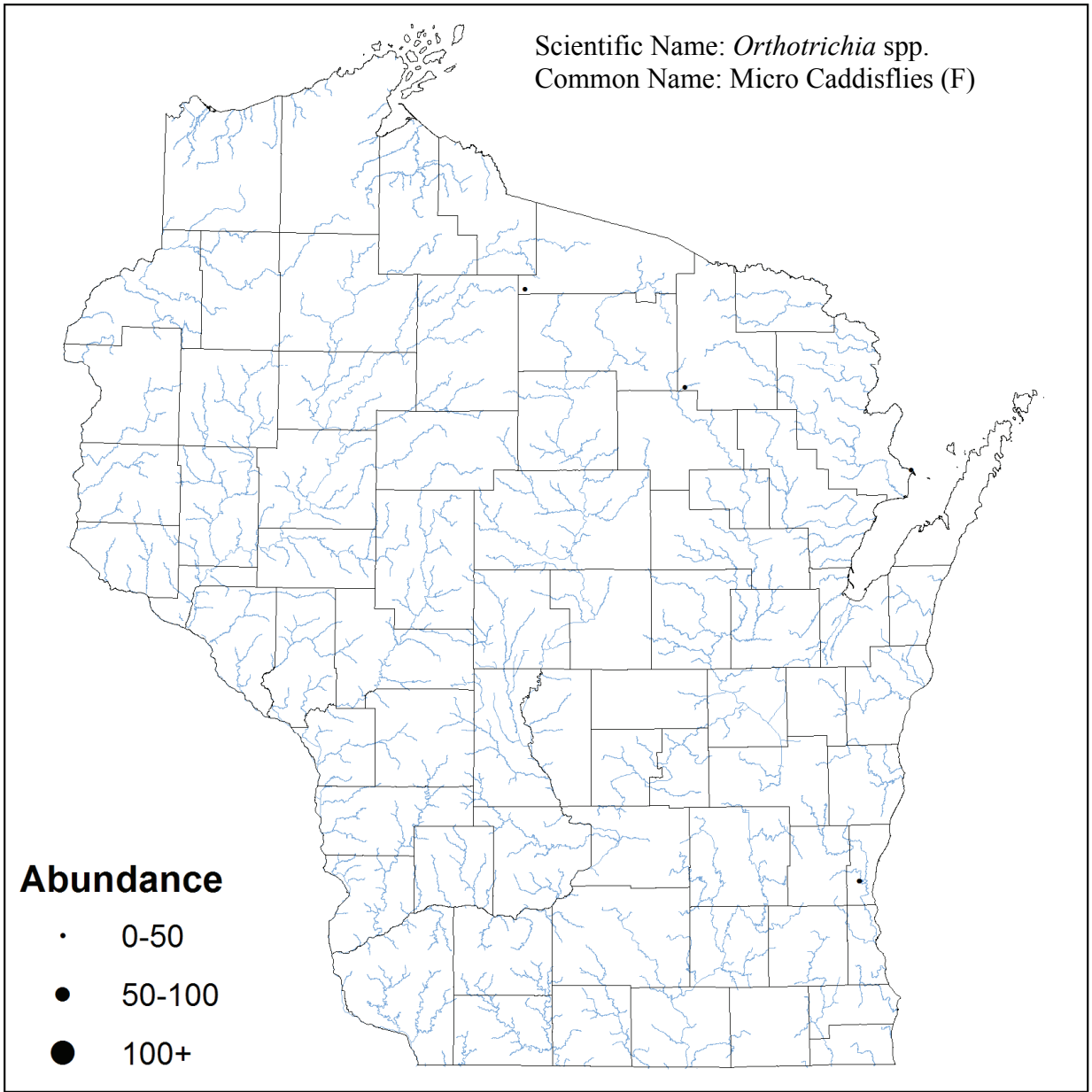
# Trichoptera Hydroptilidae



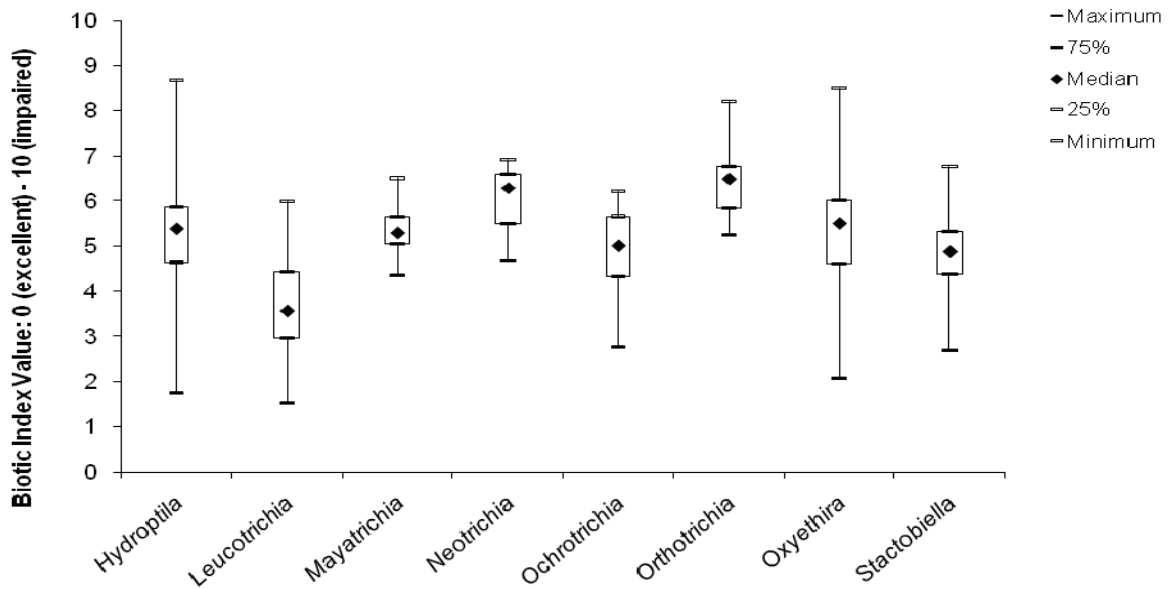
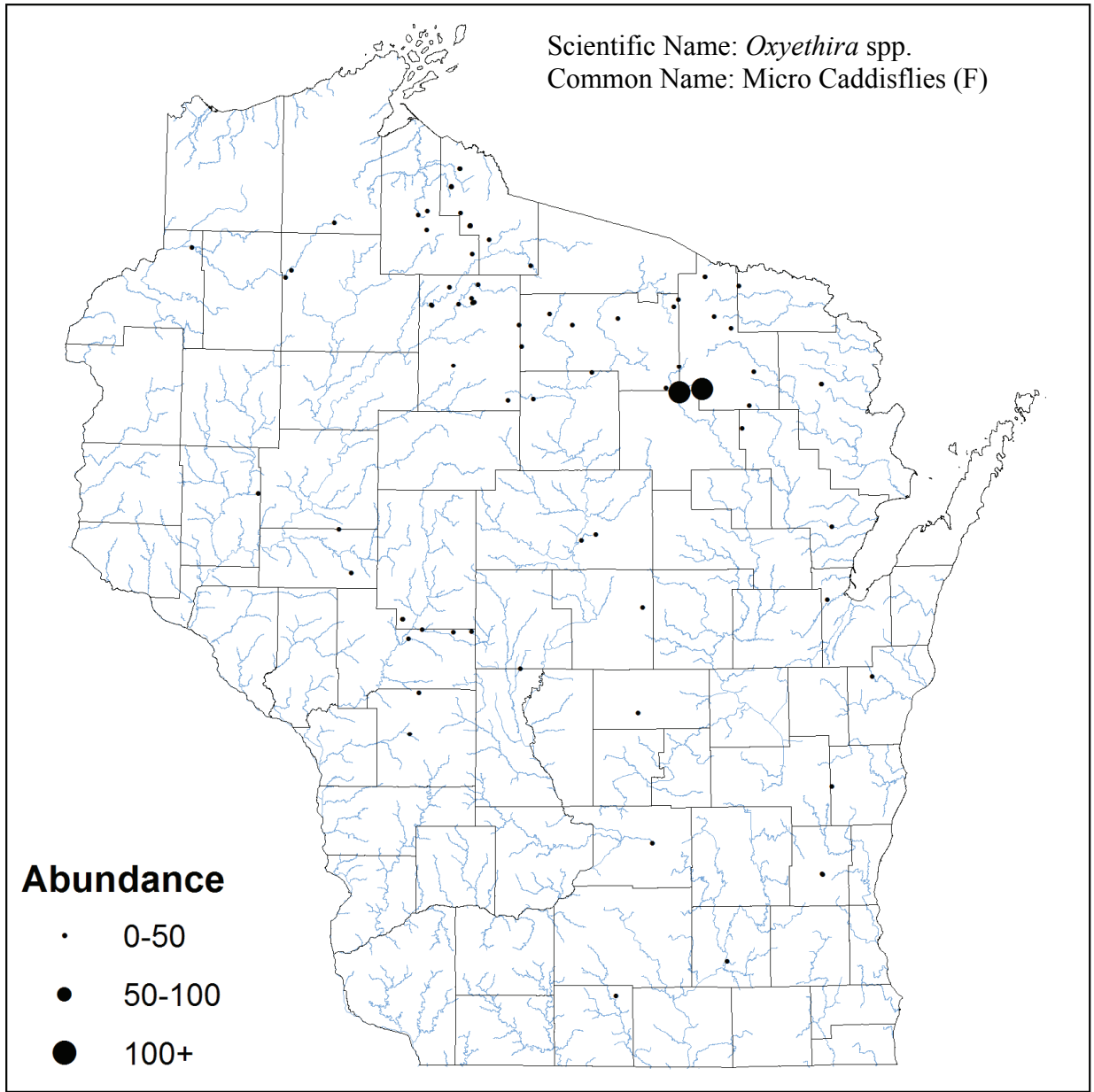
# Trichoptera Hydroptilidae



# Trichoptera Hydroptilidae

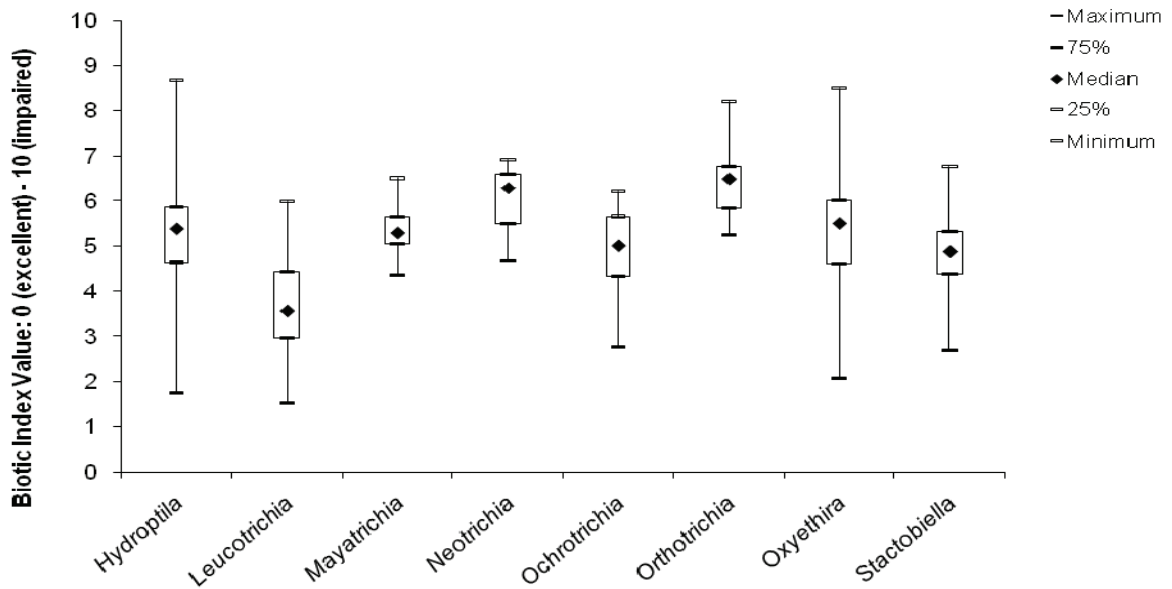
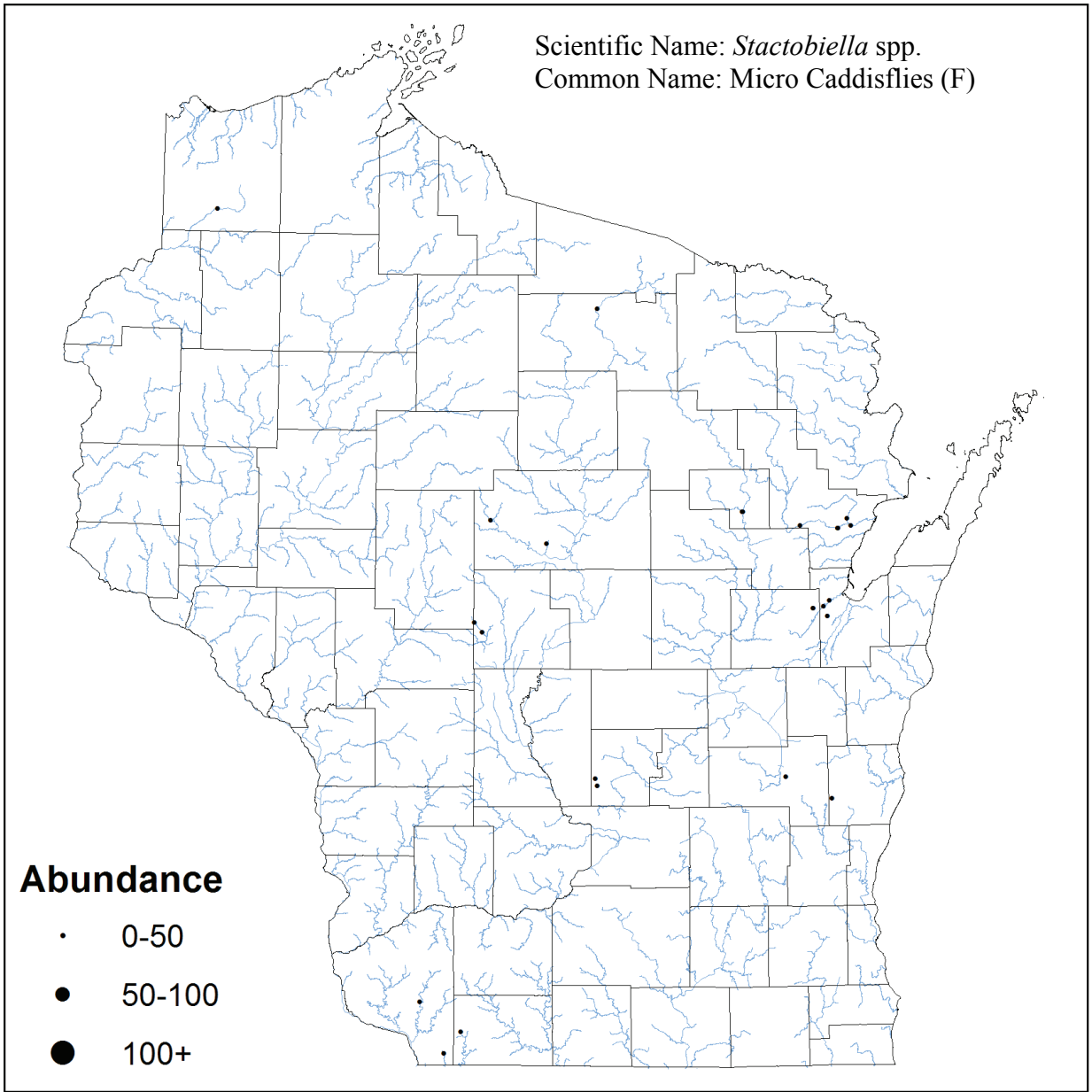


# Trichoptera Hydroptilidae

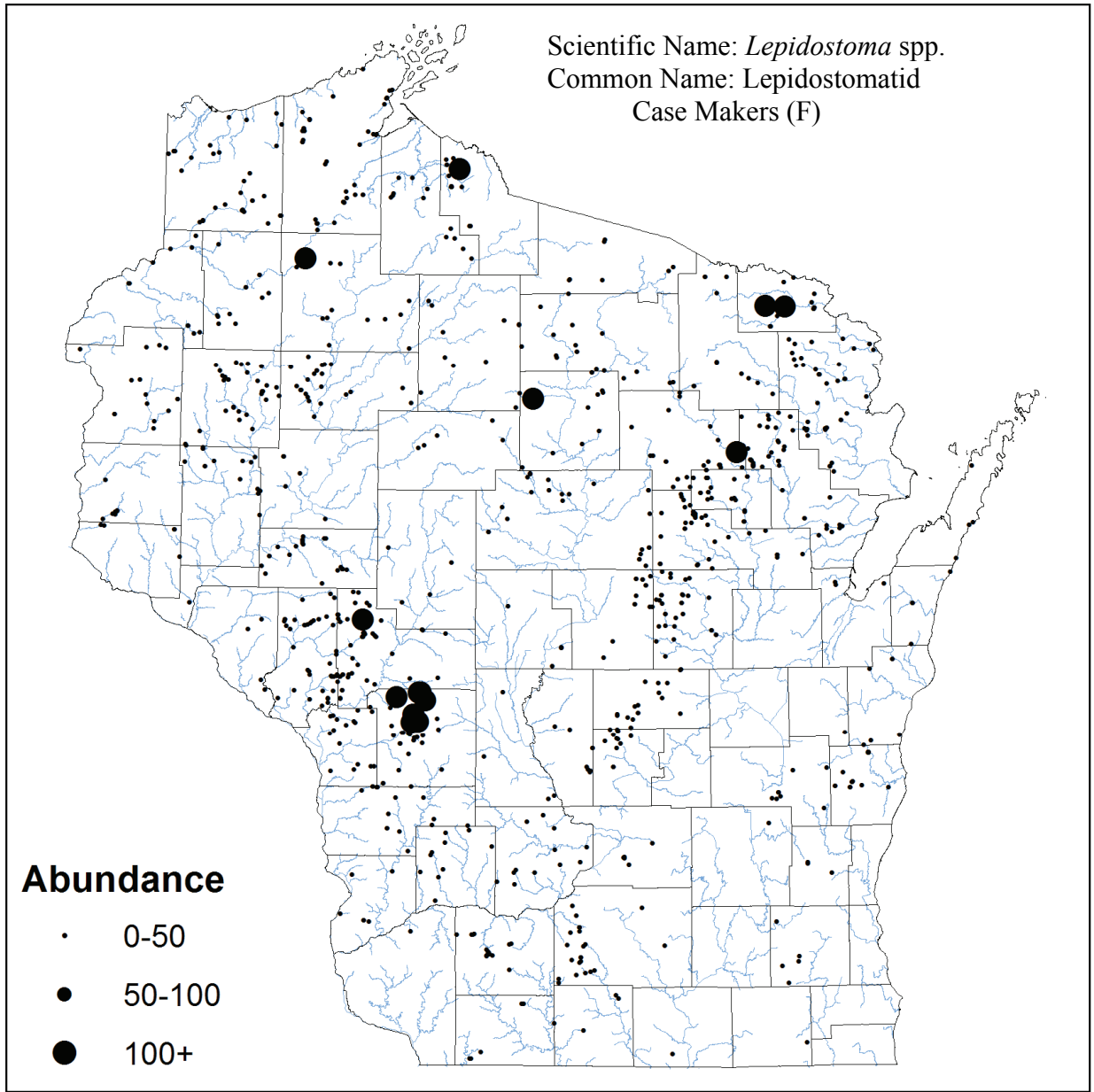




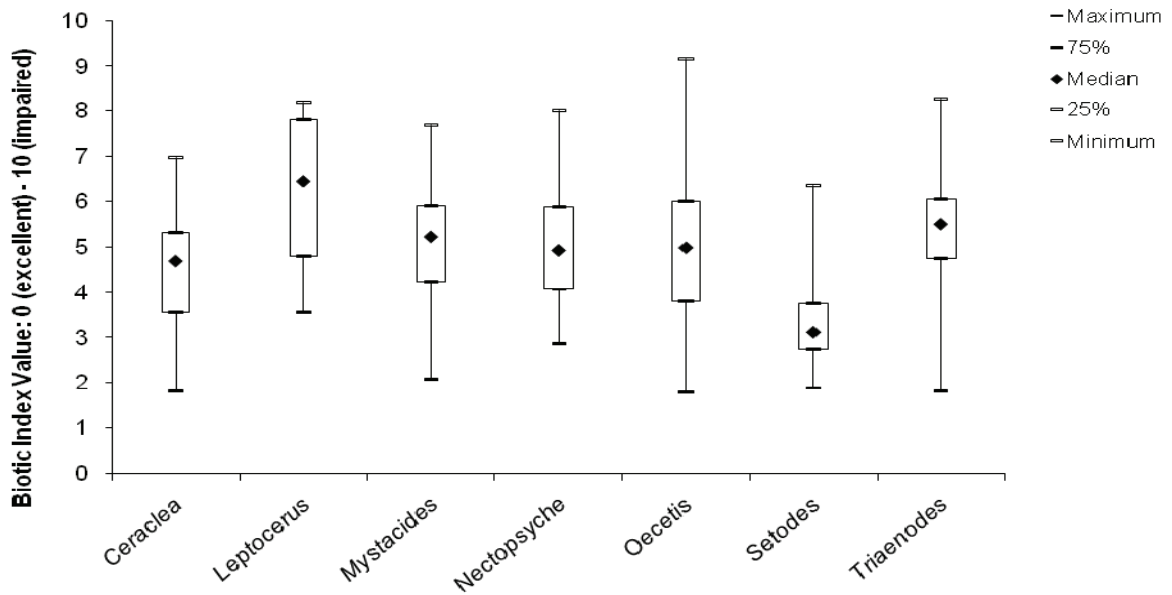
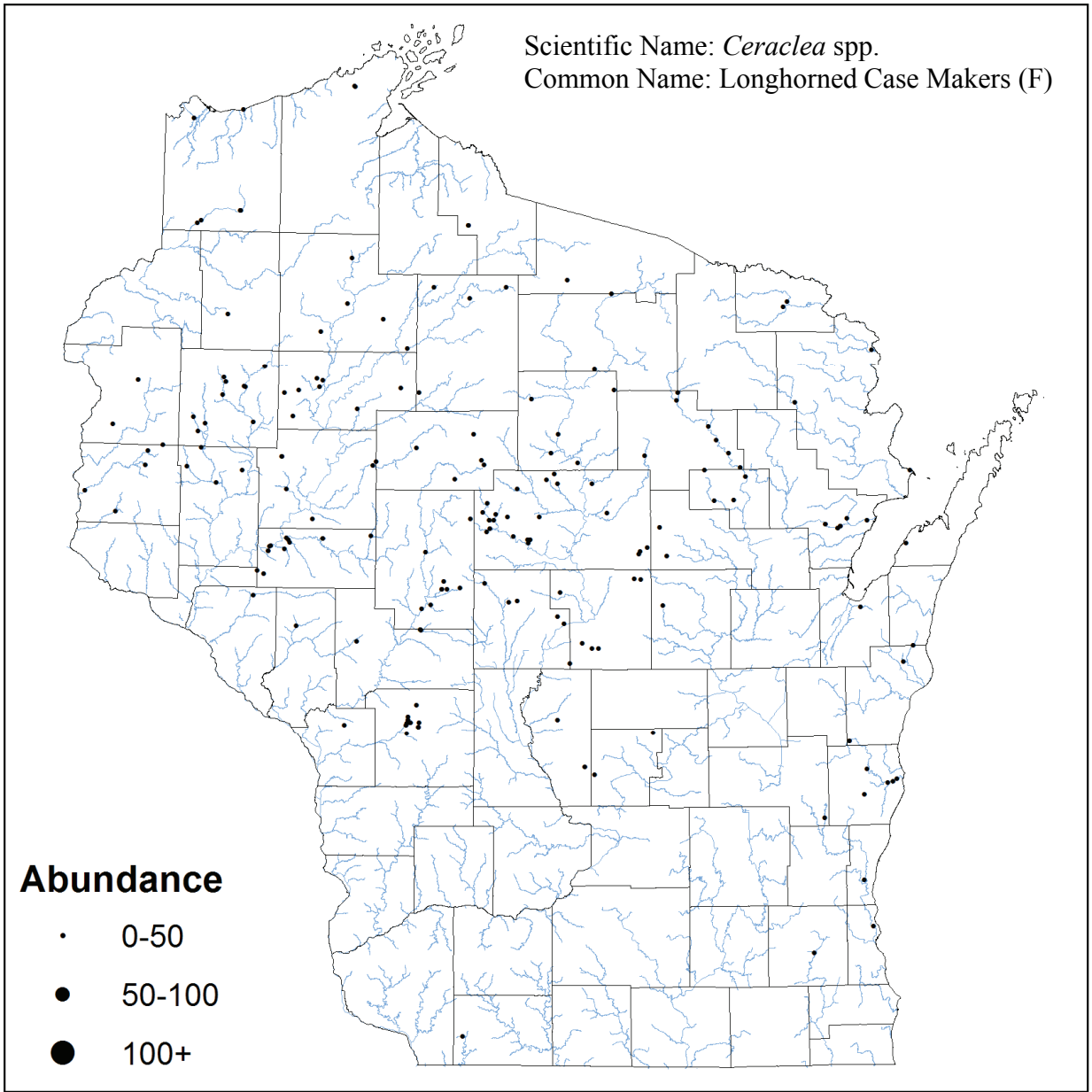
# Trichoptera Hydroptilidae



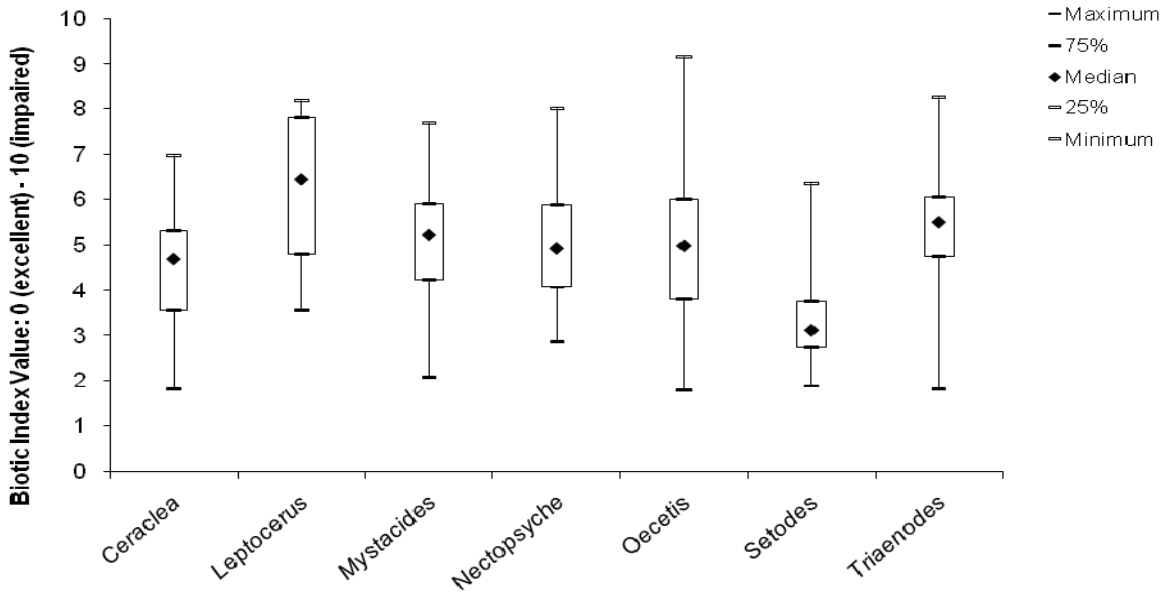
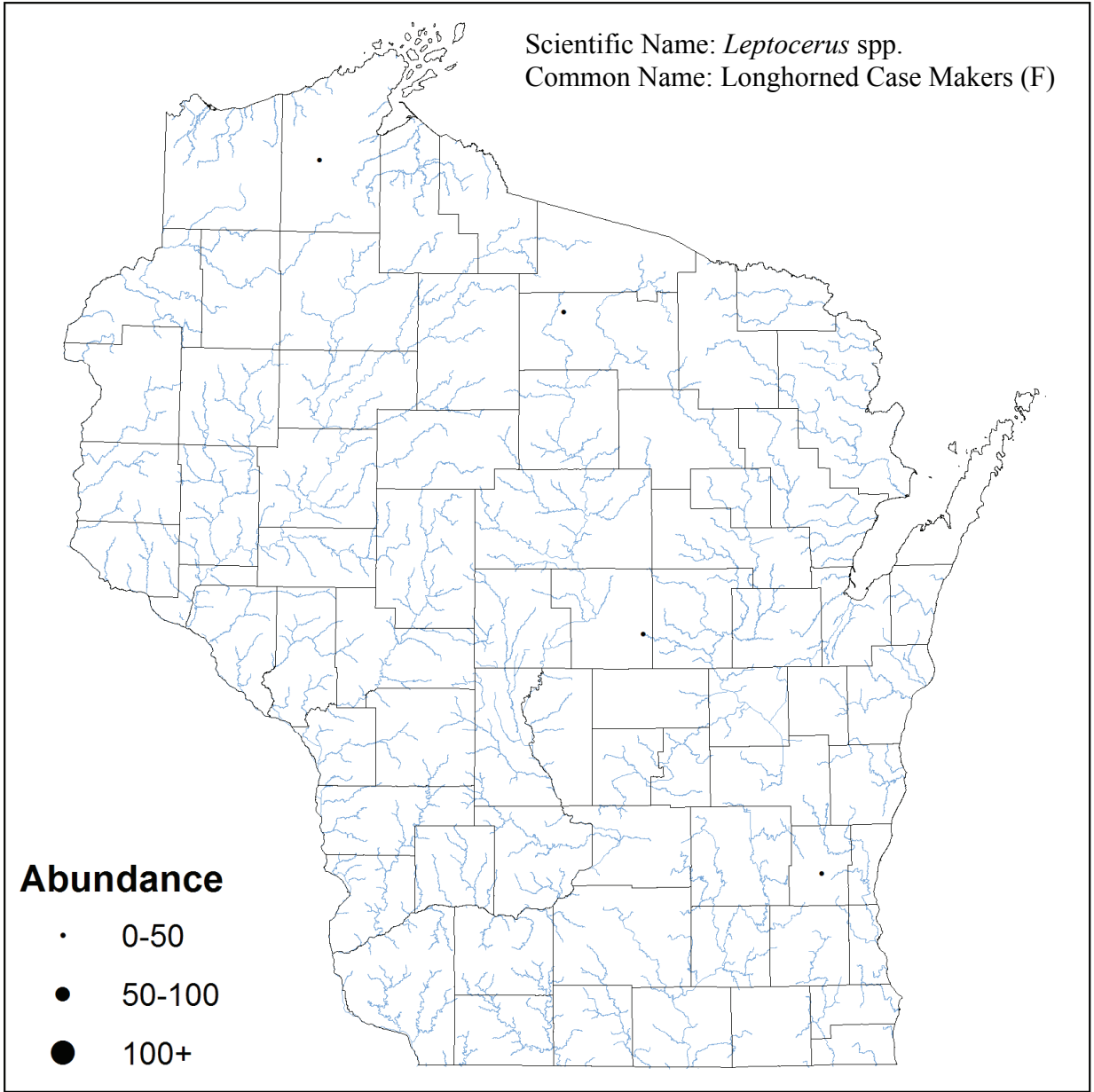
# Trichoptera Lepidostomatidae



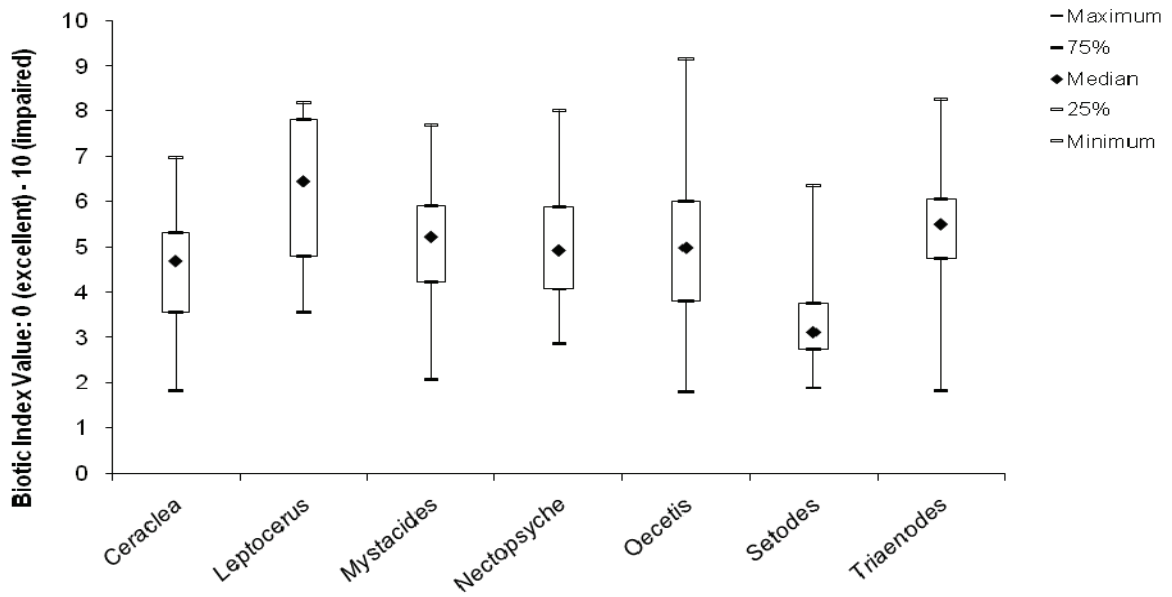
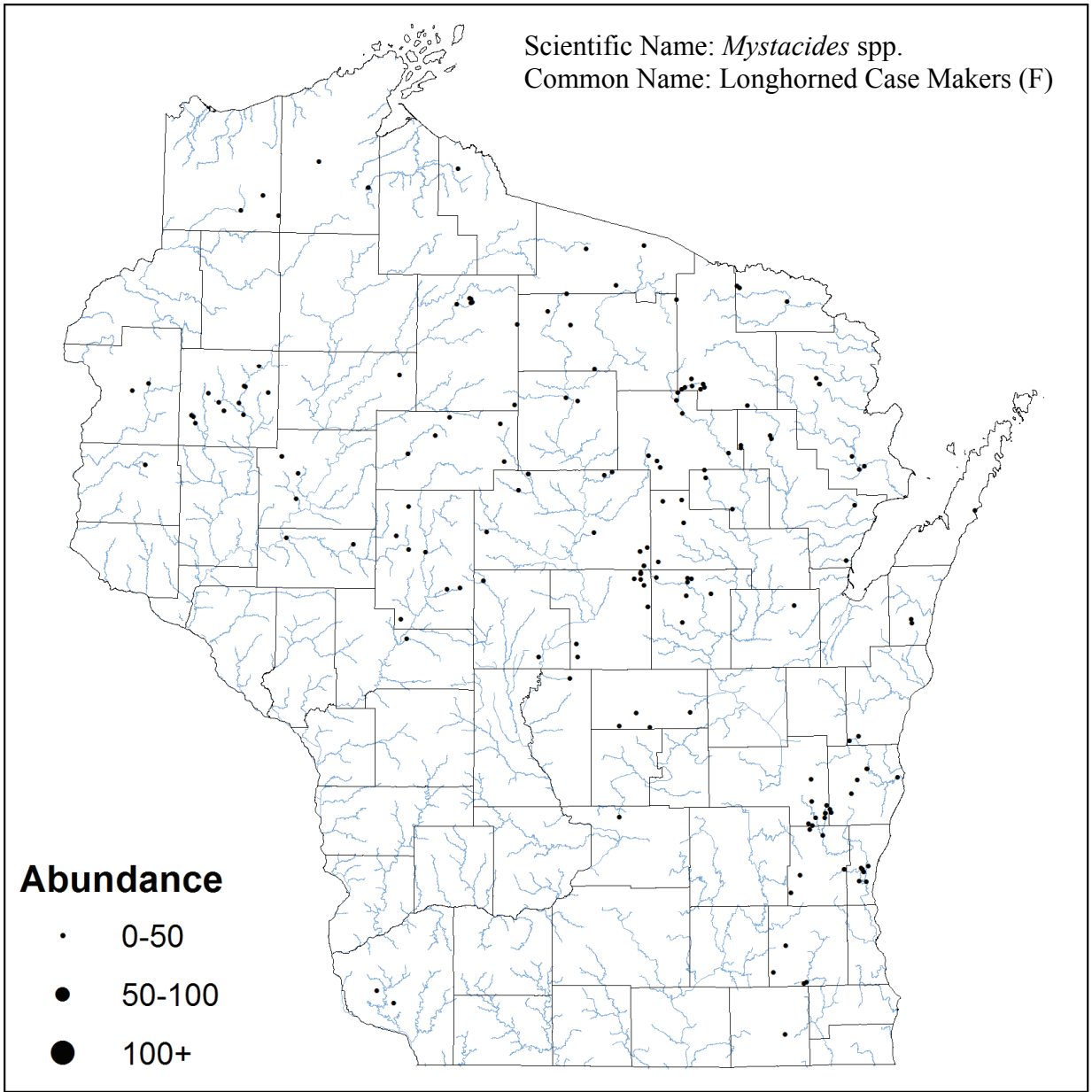
# Trichoptera Leptoceridae



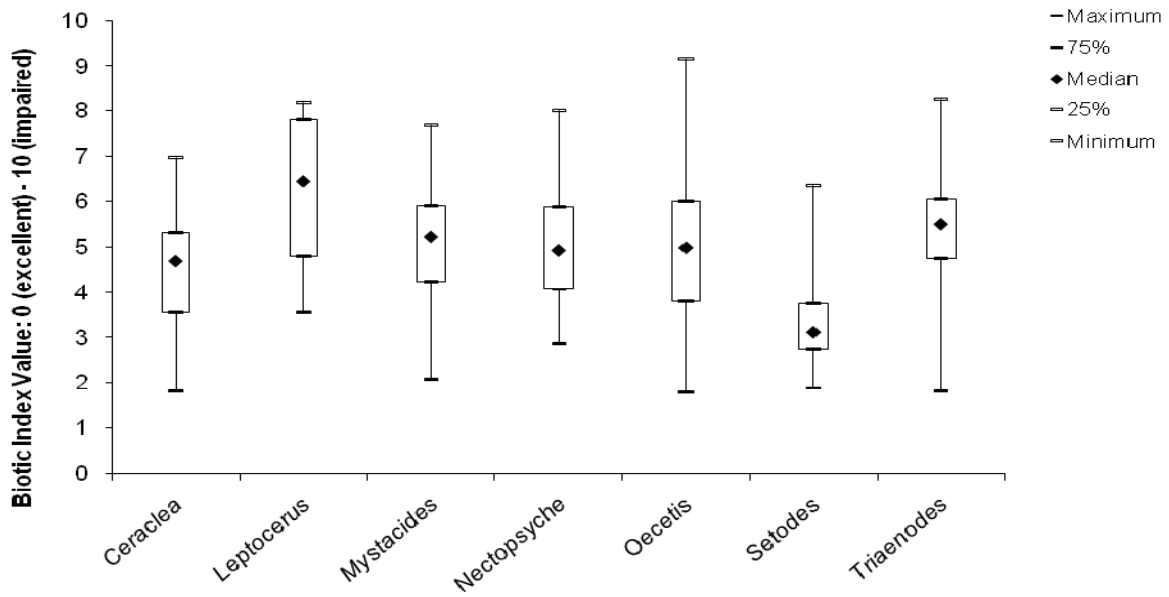
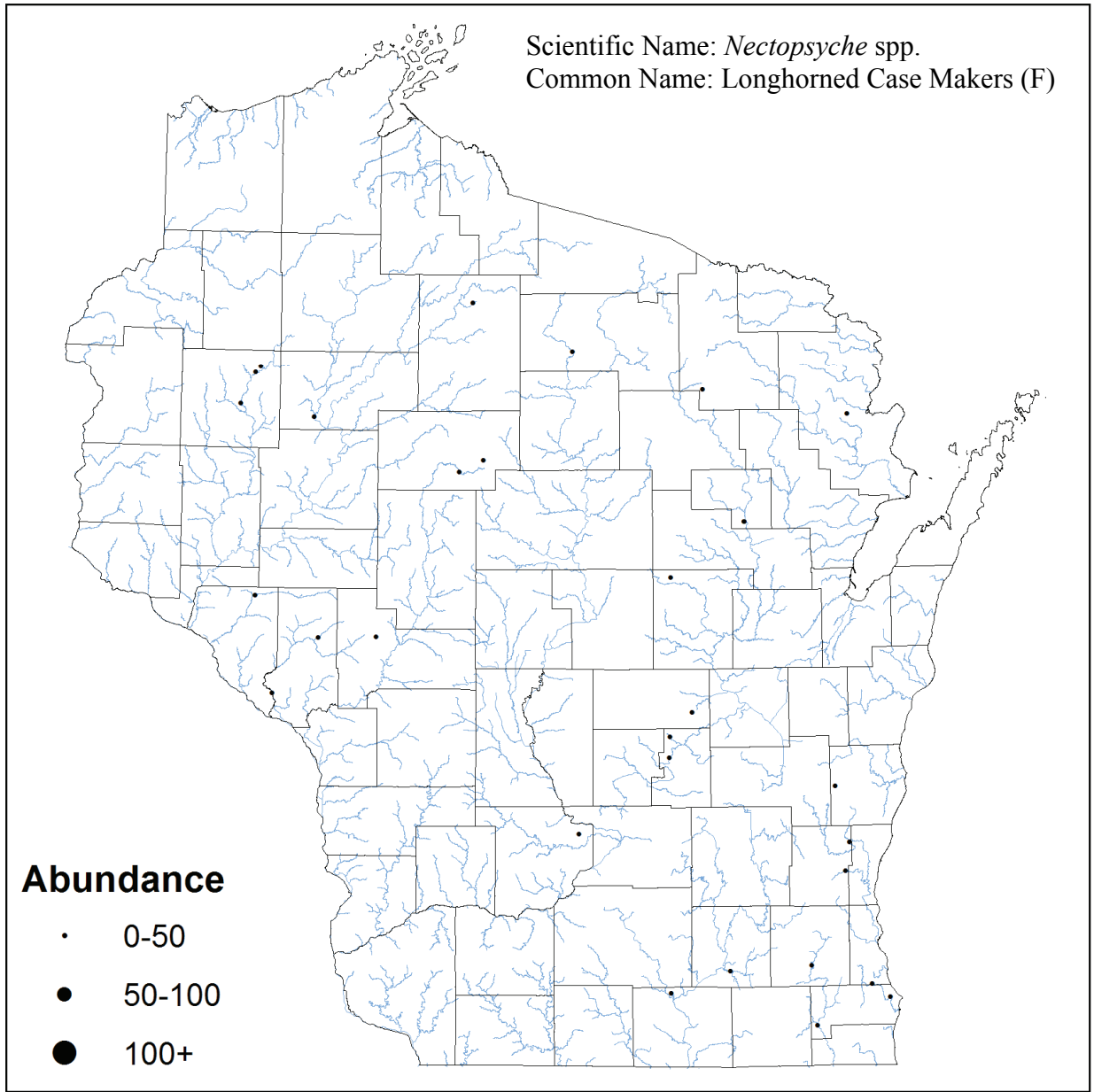
# Trichoptera Leptoceridae

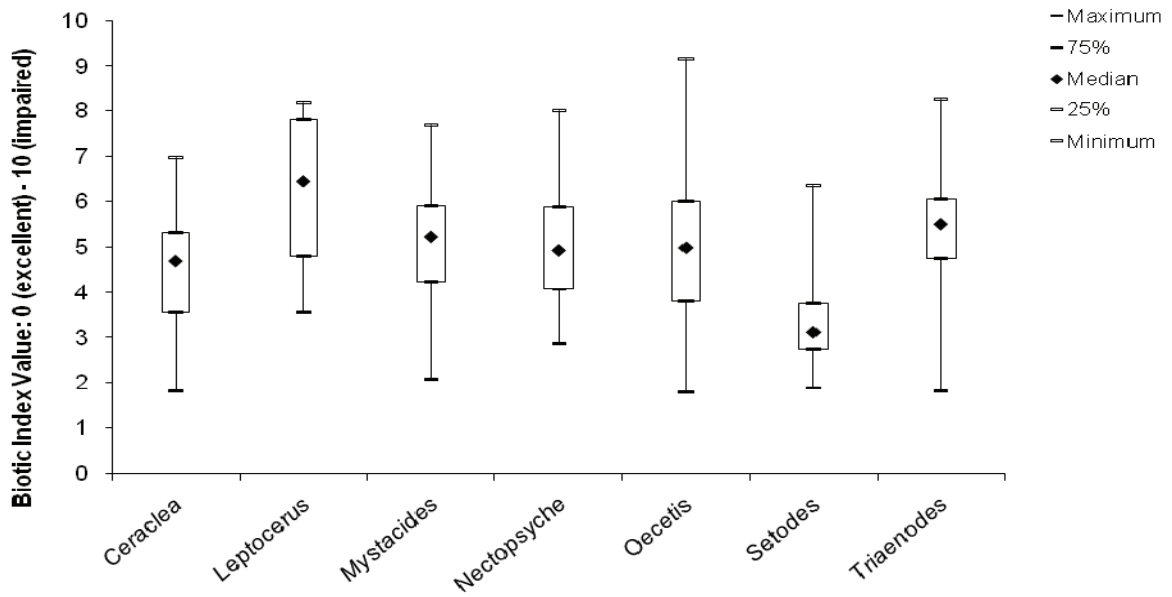
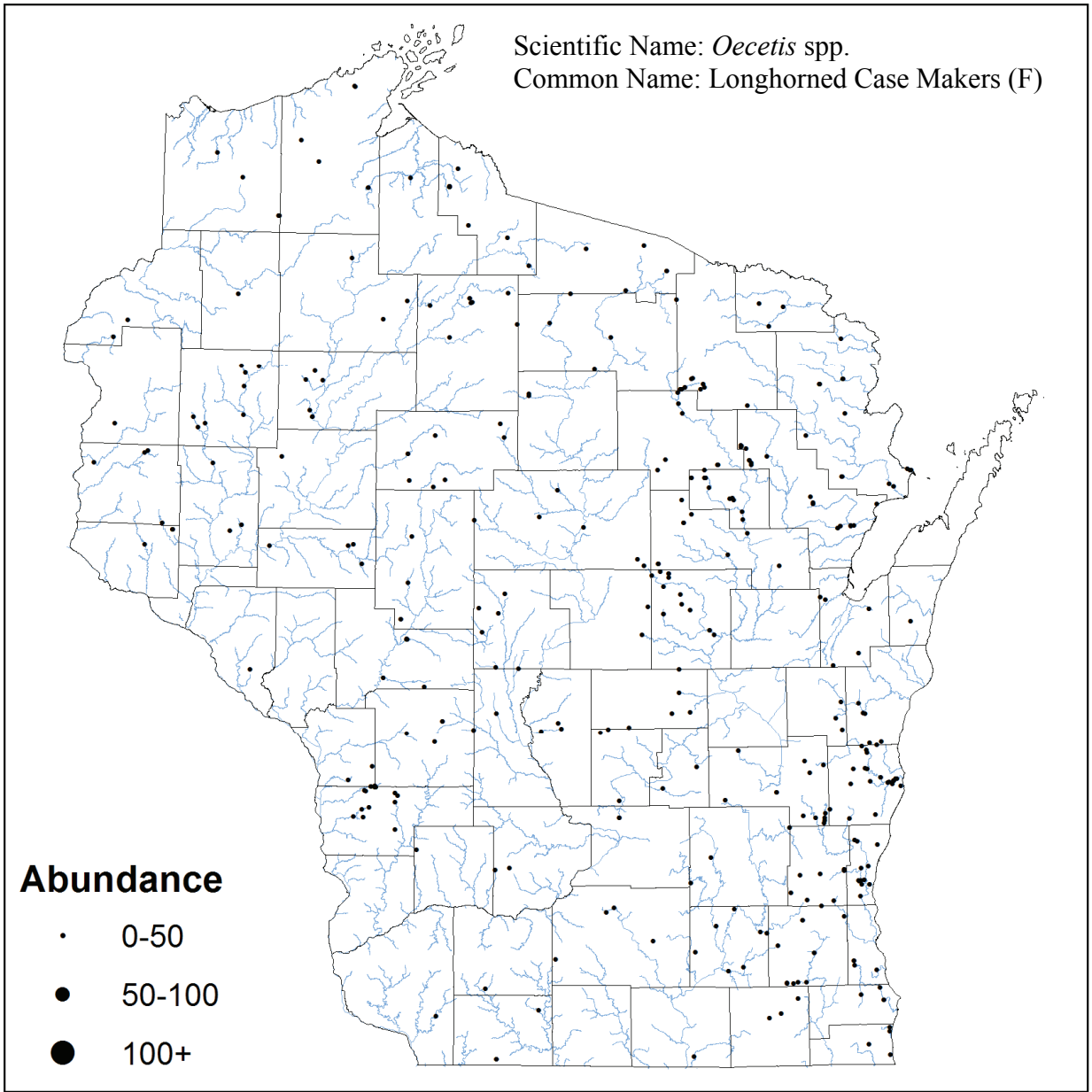


# Trichoptera Leptoceridae

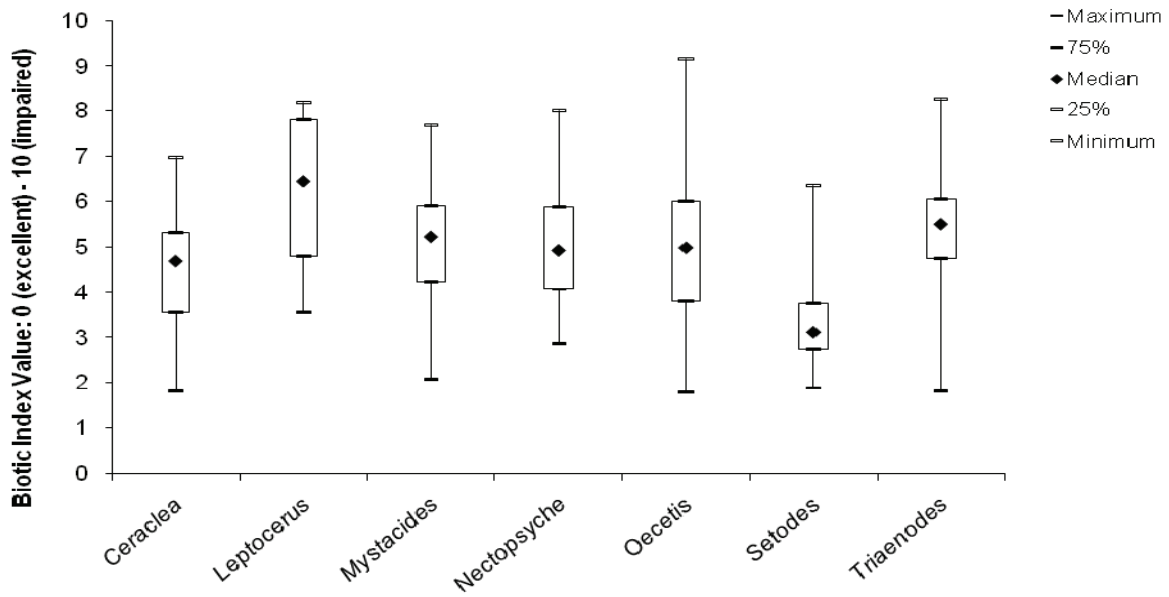
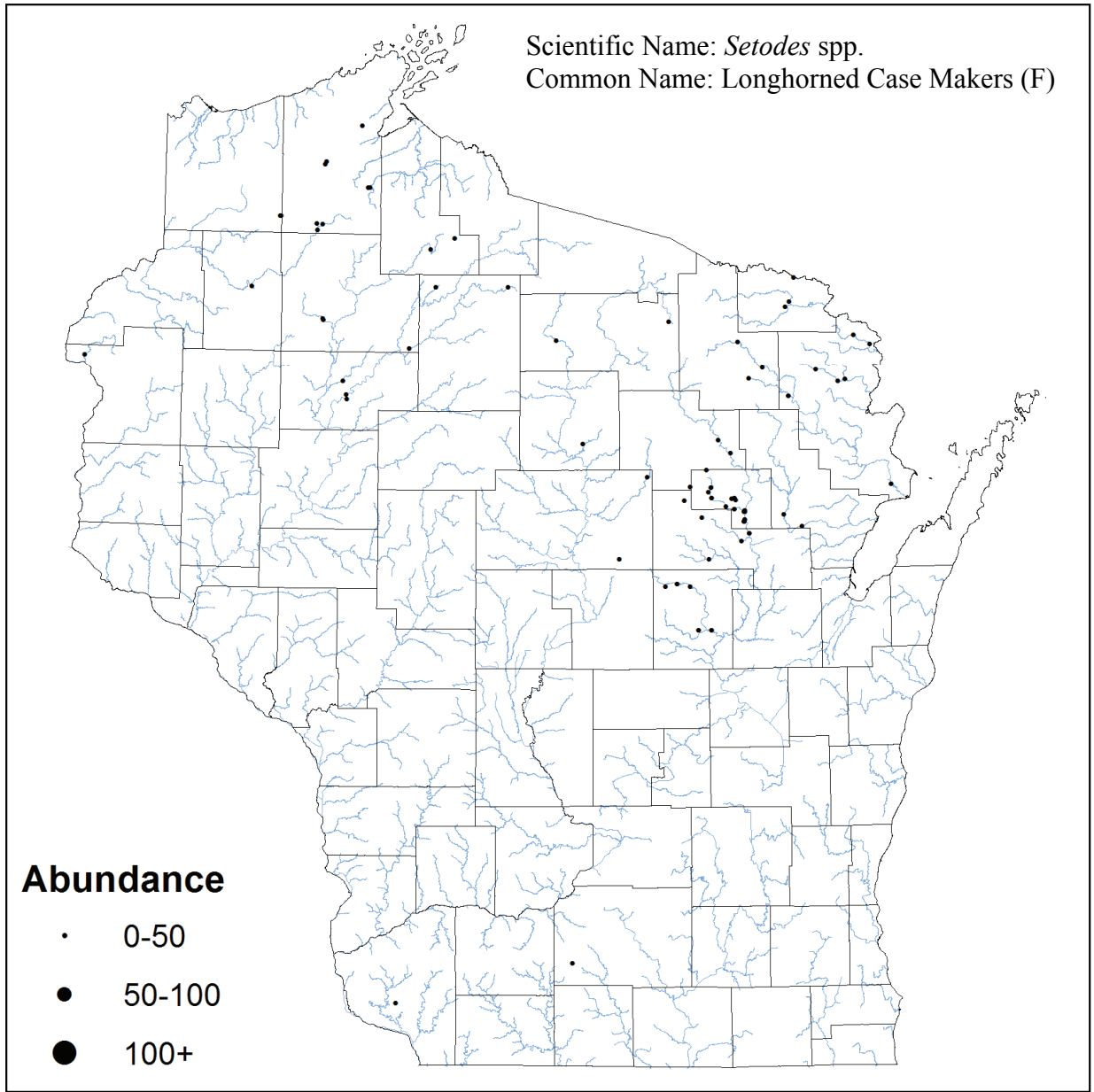


# Trichoptera Leptoceridae



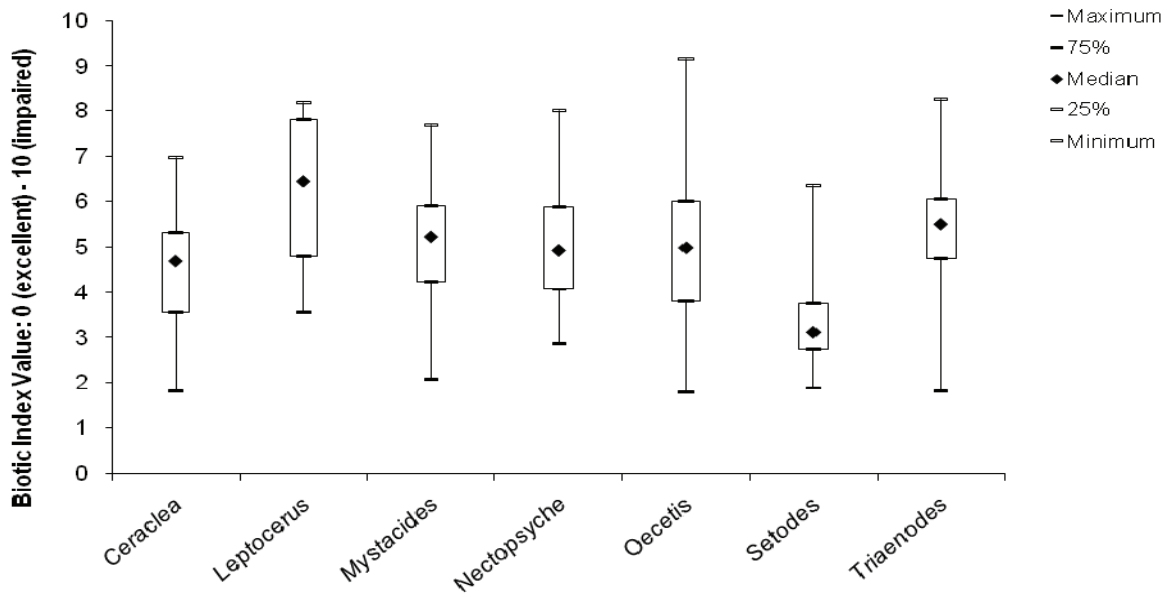
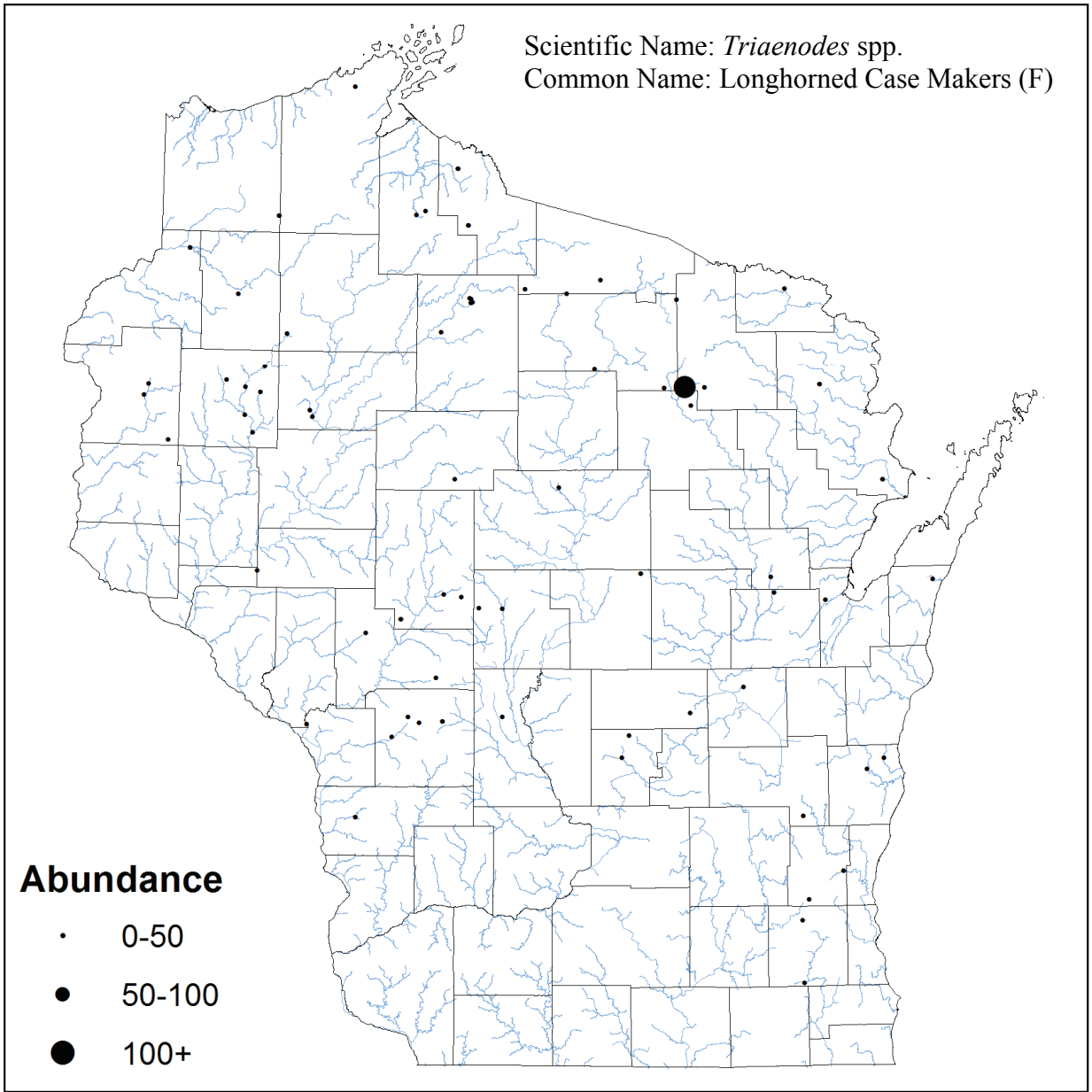


# Trichoptera Leptoceridae

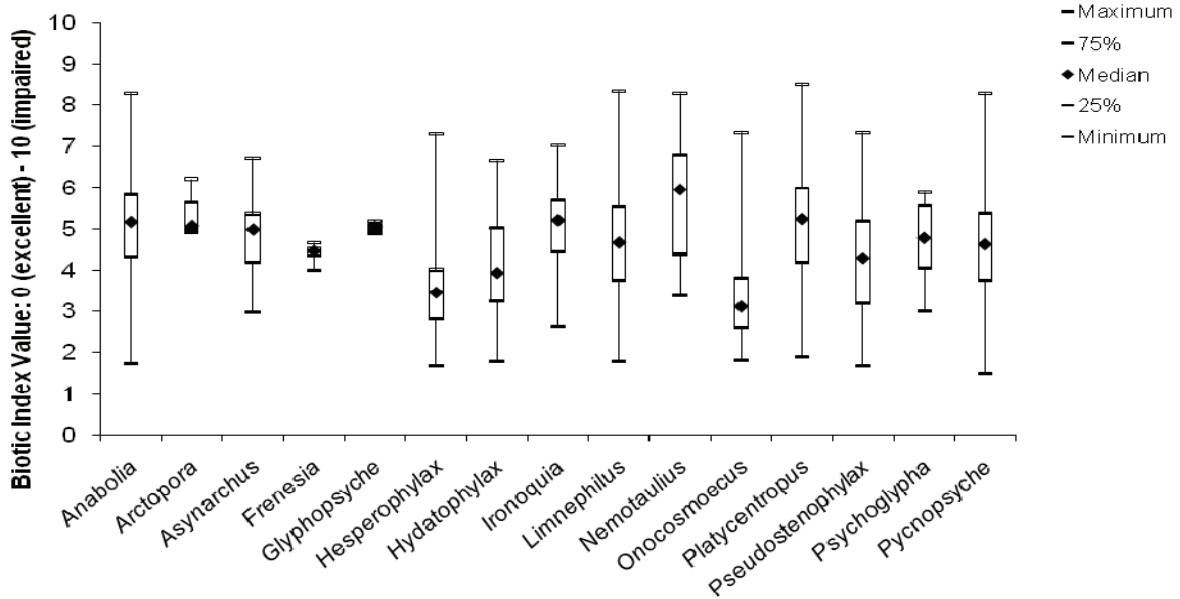
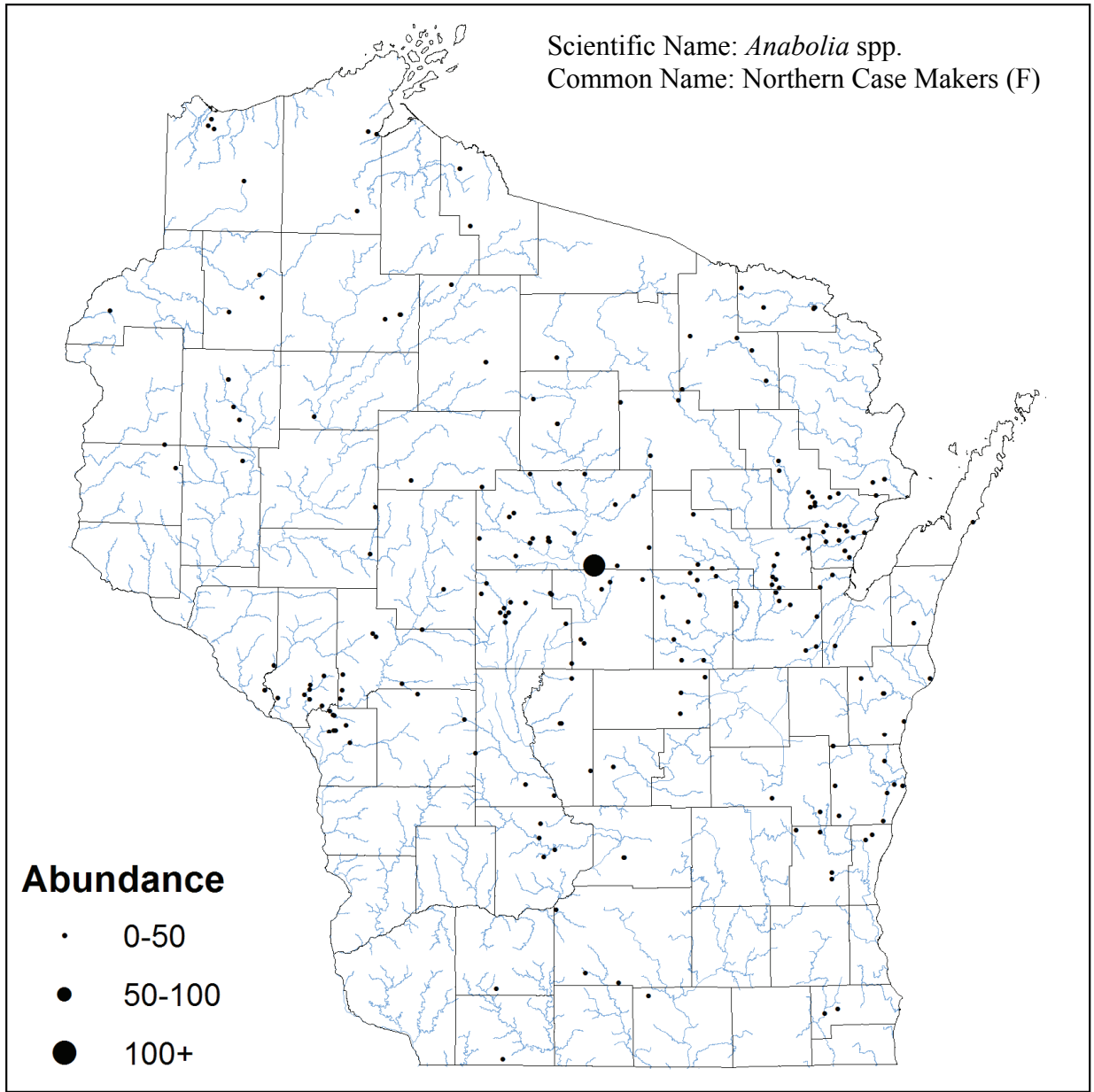




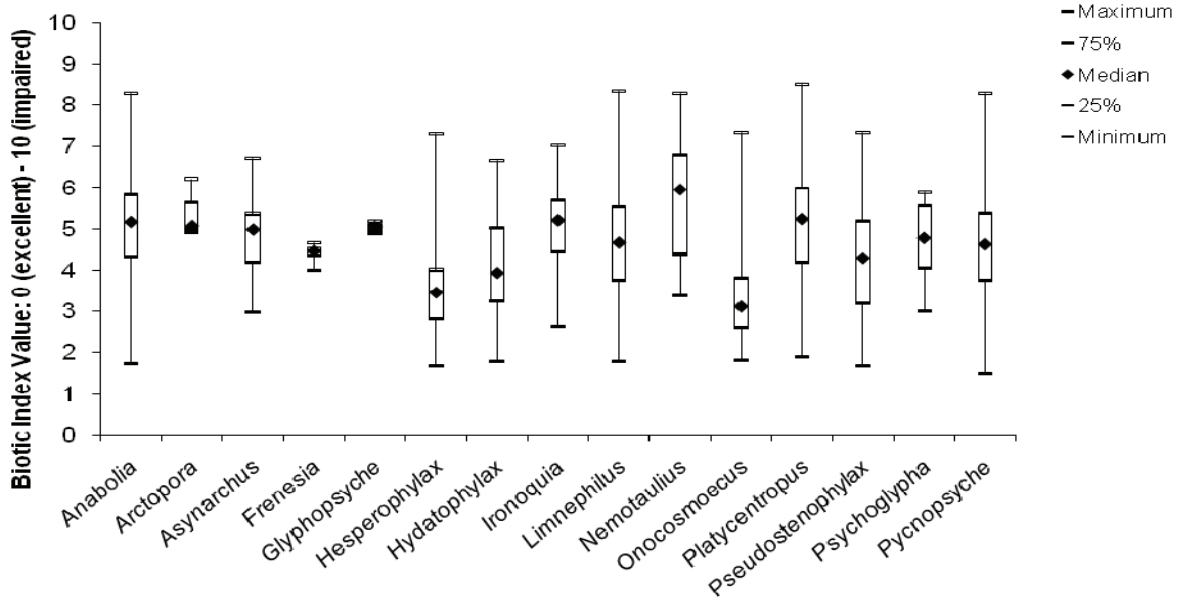
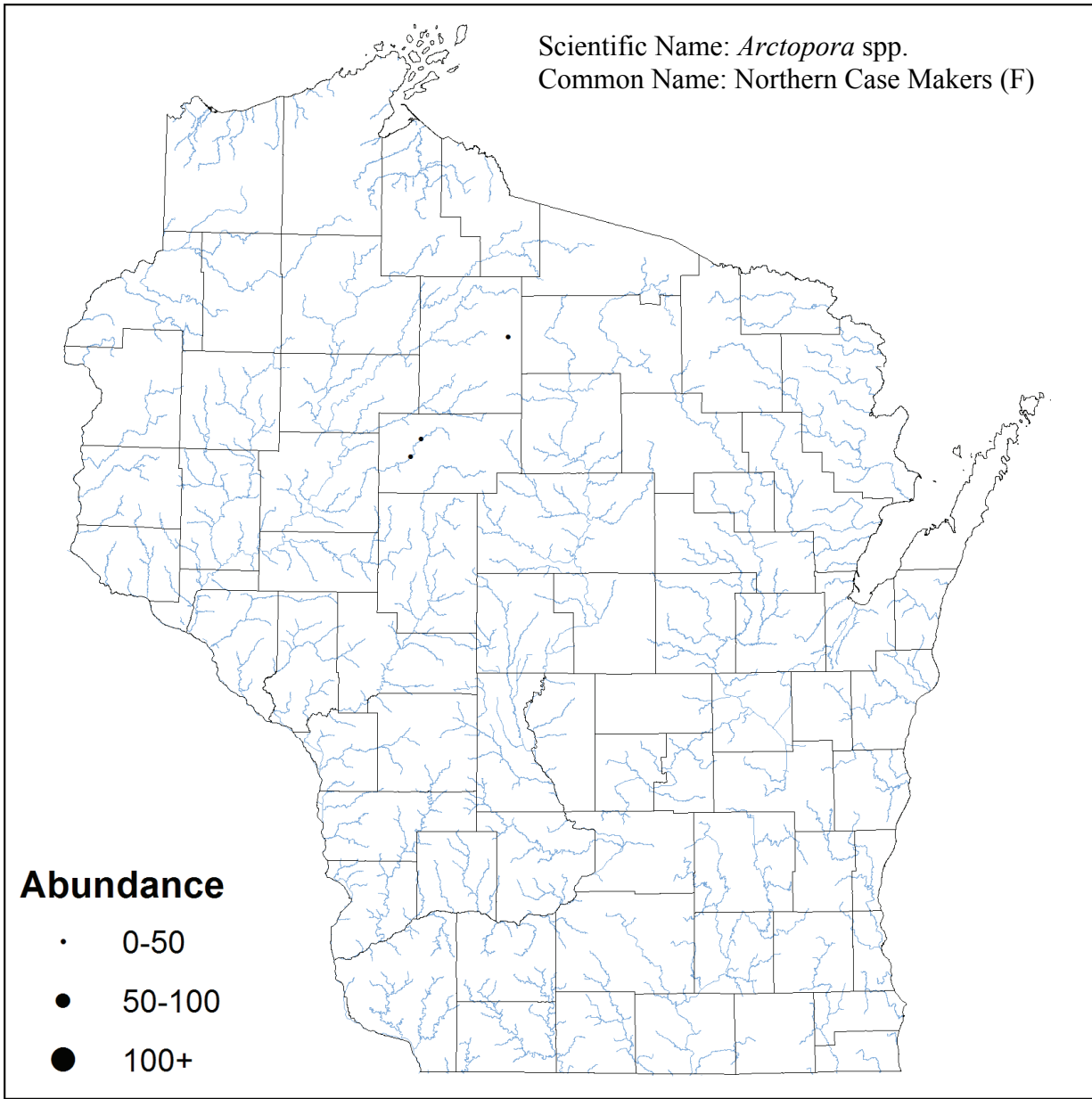
# Trichoptera Leptoceridae



# Trichoptera Limnephilidae



# Trichoptera Limnephilidae

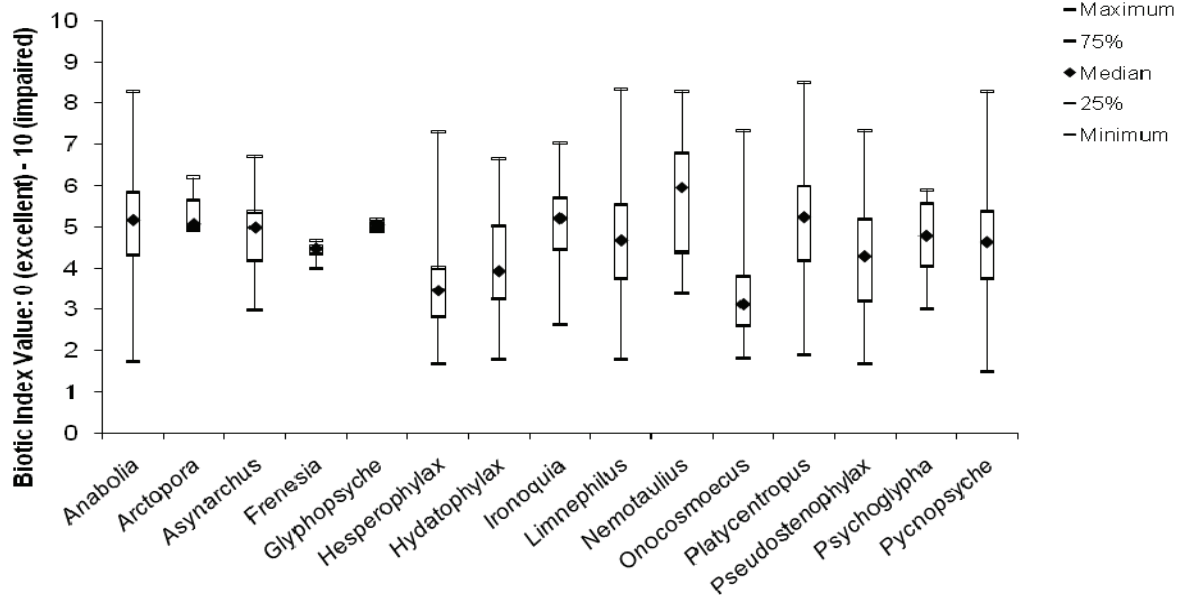
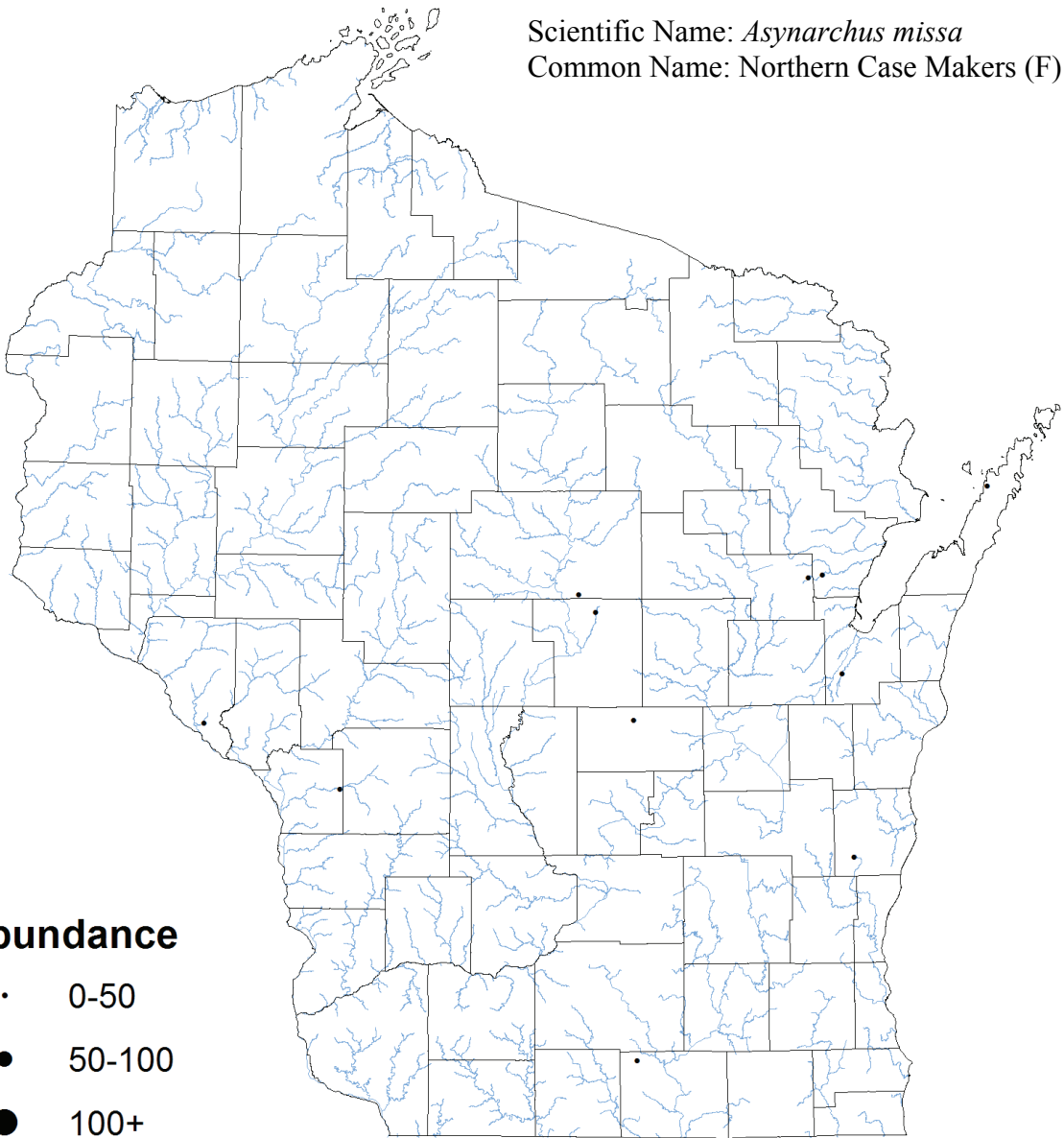


# Trichoptera Limnephilidae

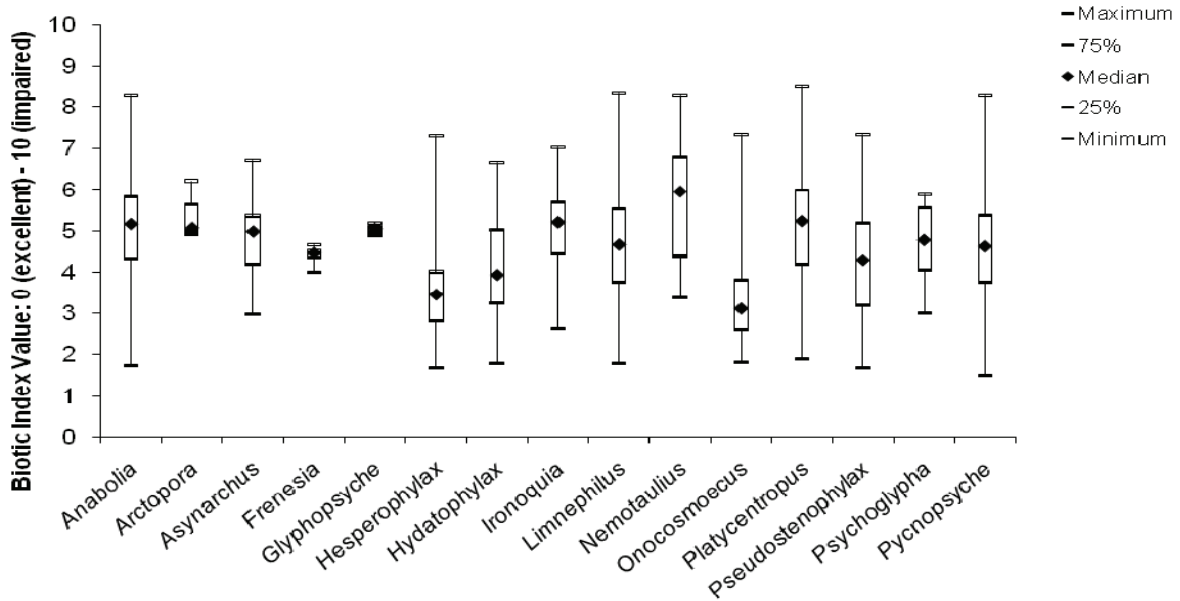
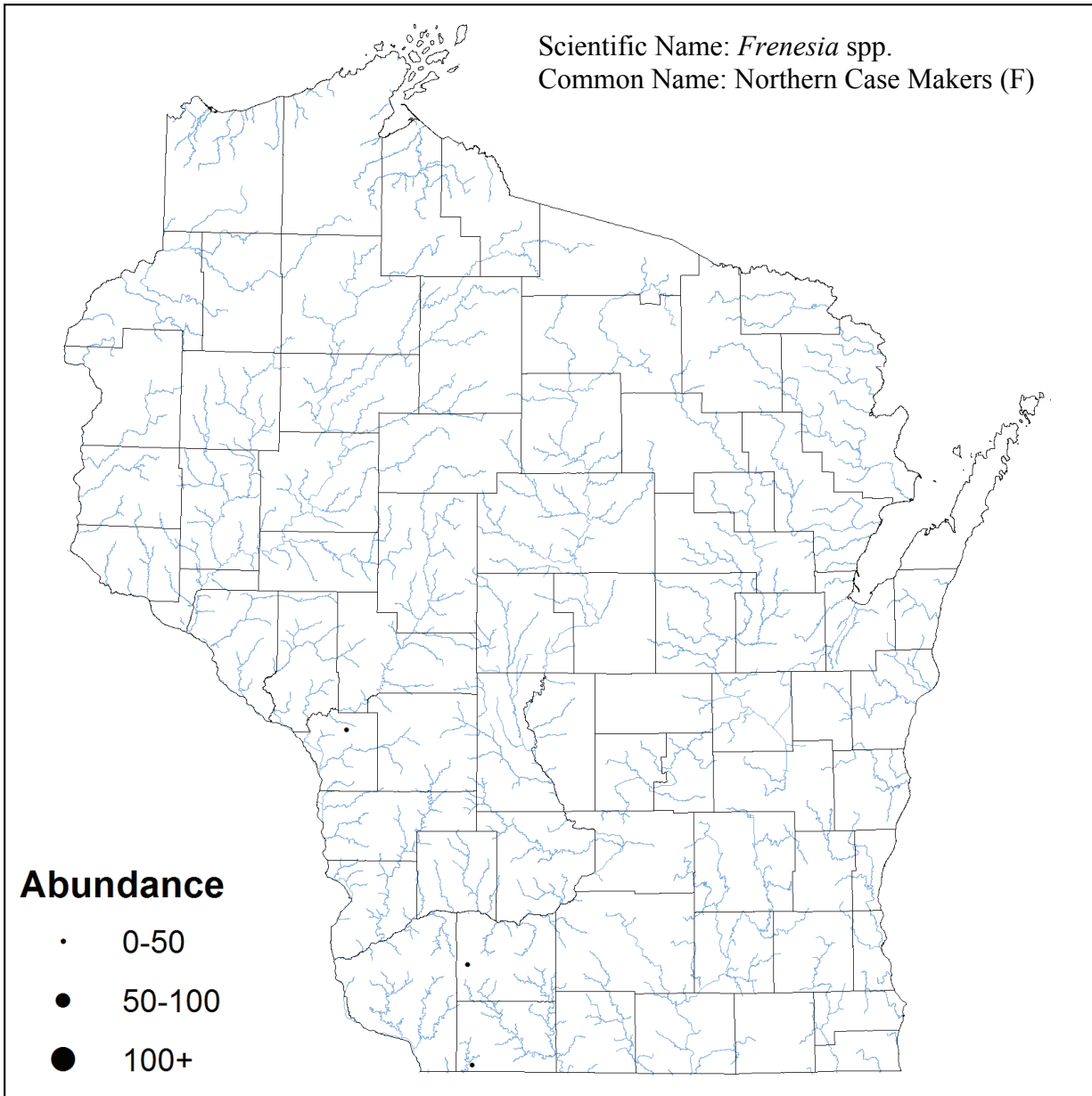
Scientific Name: *Asynarchus missa*  
 Common Name: Northern Case Makers (F)

## Abundance

- 0-50
- 50-100
- 100+



# Trichoptera Limnephilidae

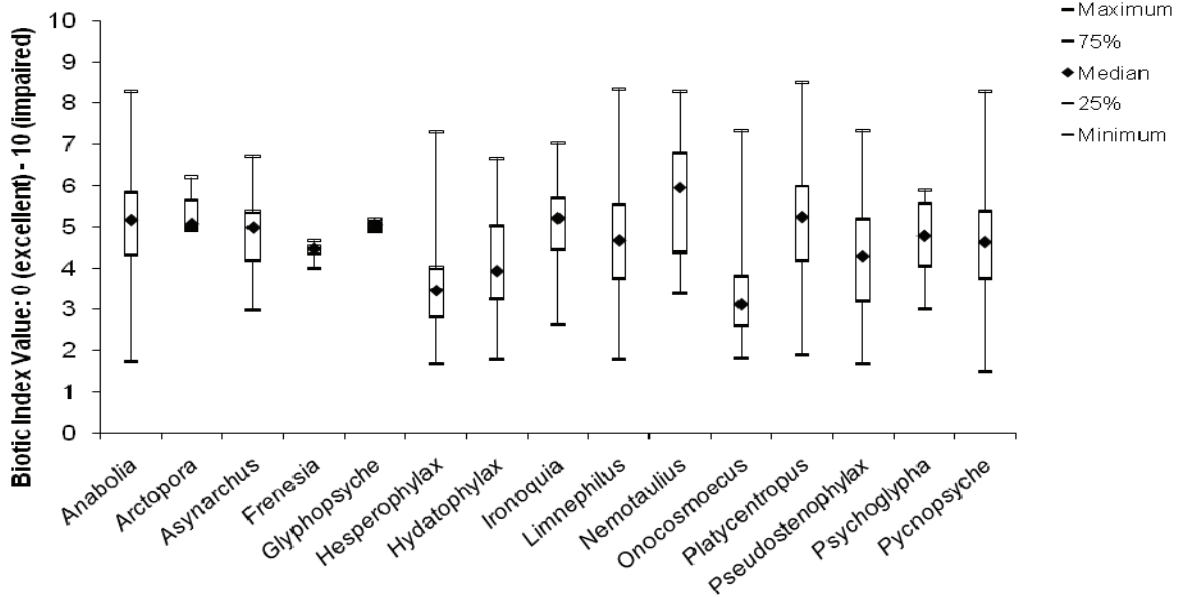
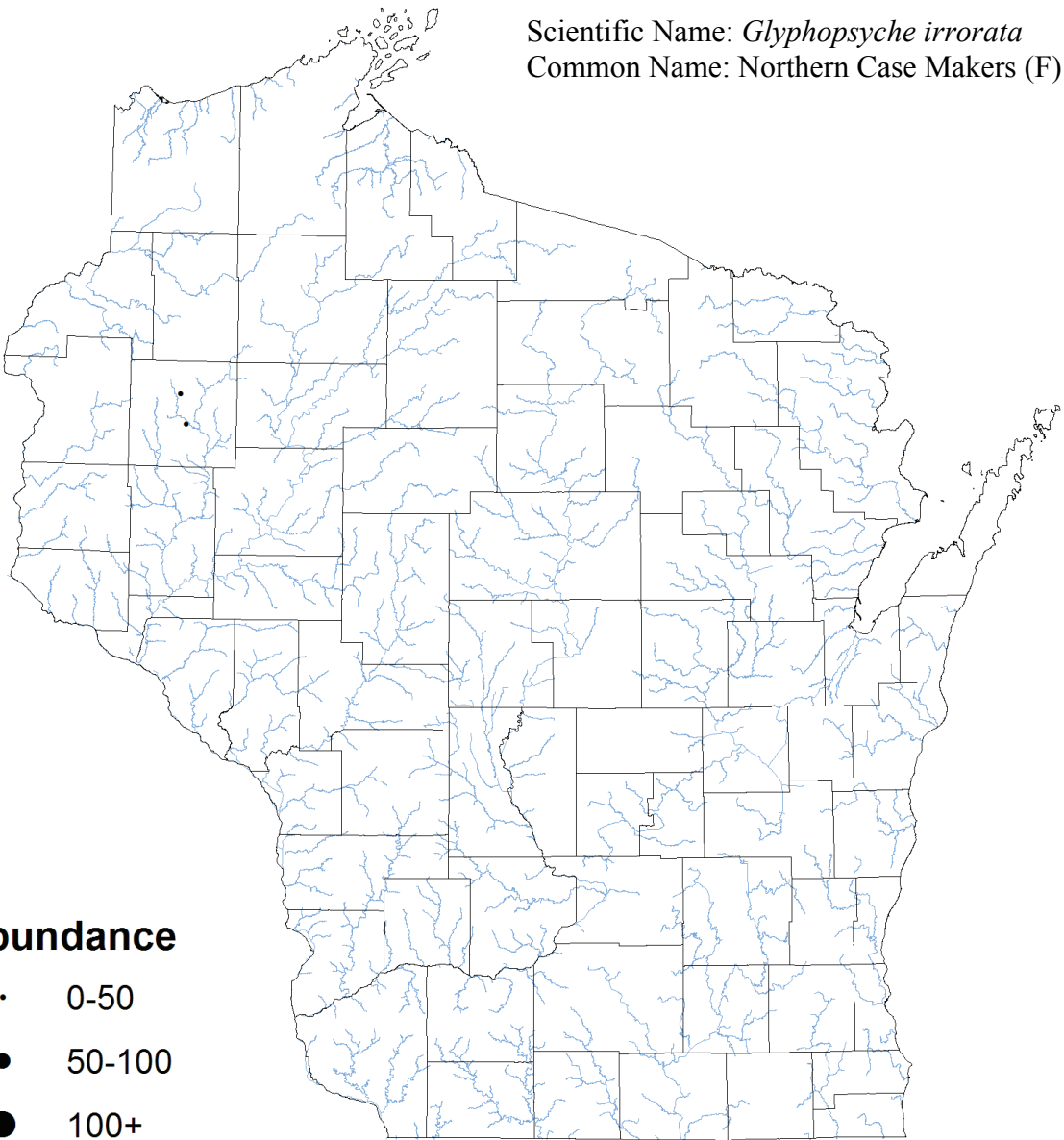


# Trichoptera Limnephilidae

Scientific Name: *Glyphopsyche irrorata*  
 Common Name: Northern Case Makers (F)

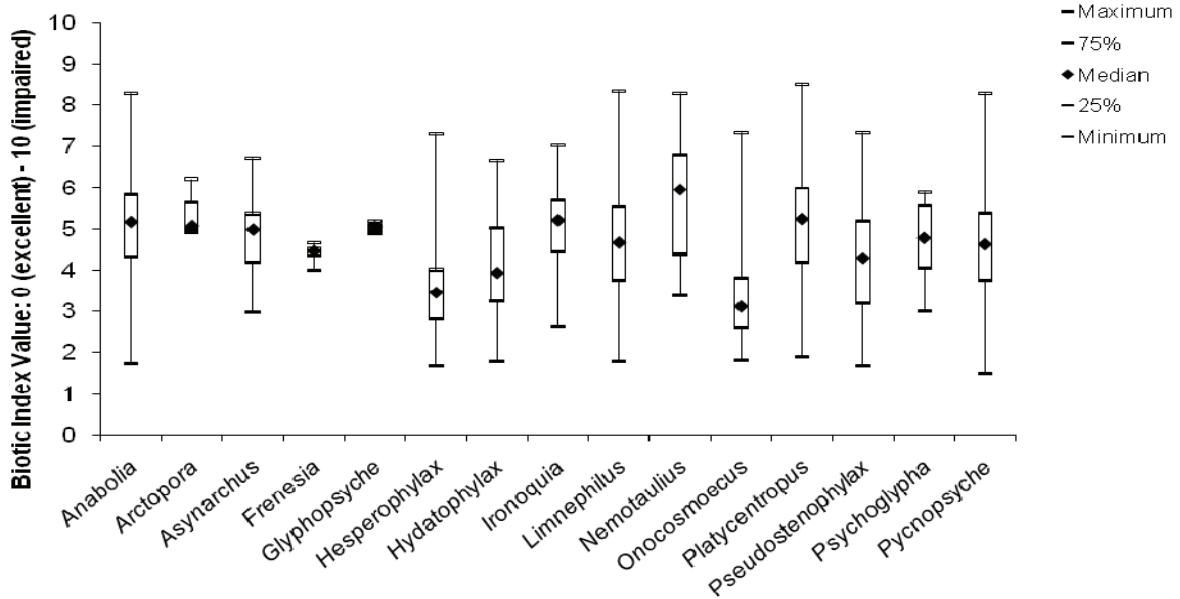
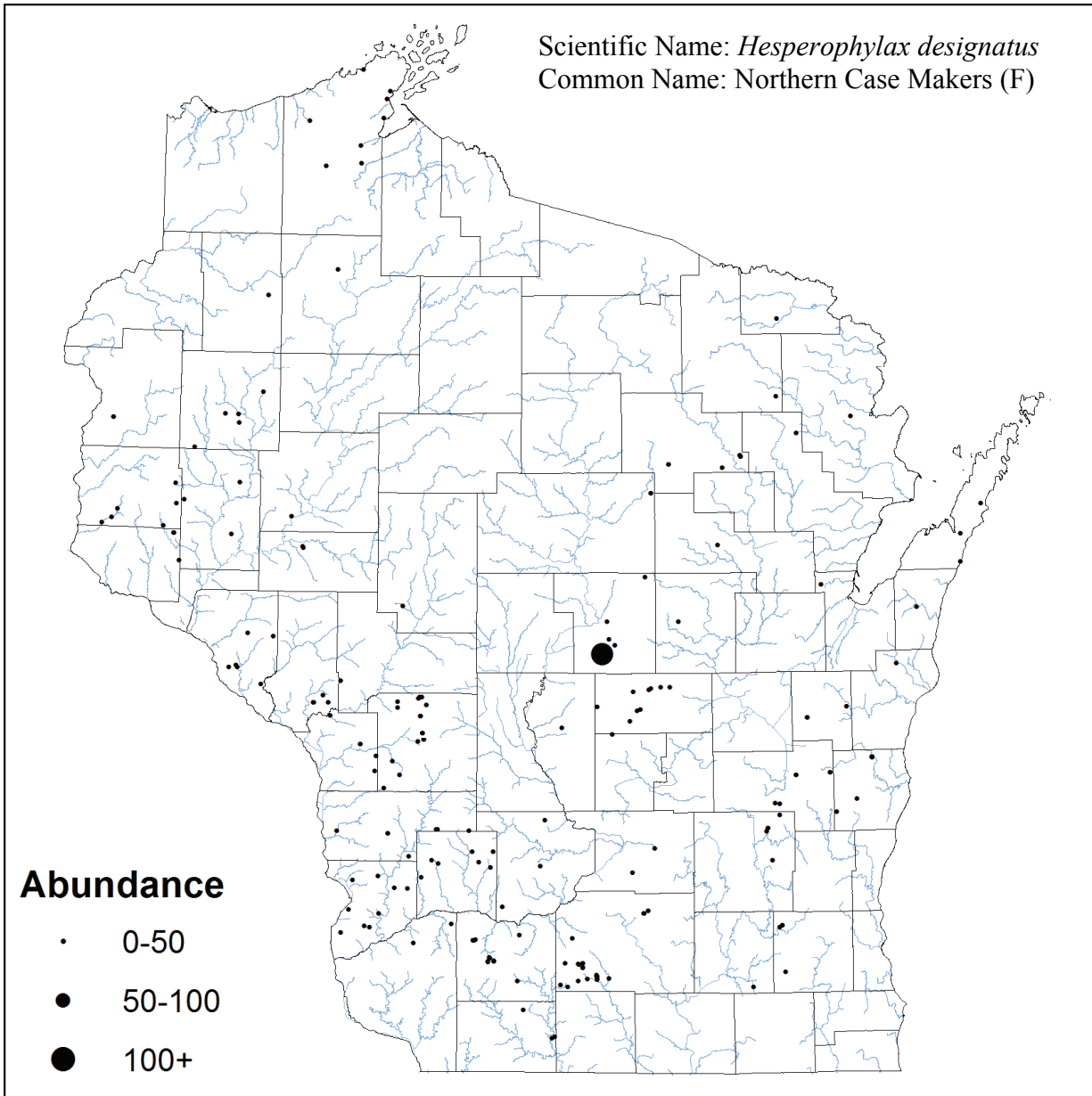
## Abundance

- 0-50
- 50-100
- 100+



# Trichoptera Limnephilidae

Scientific Name: *Hesperophylax designatus*  
 Common Name: Northern Case Makers (F)

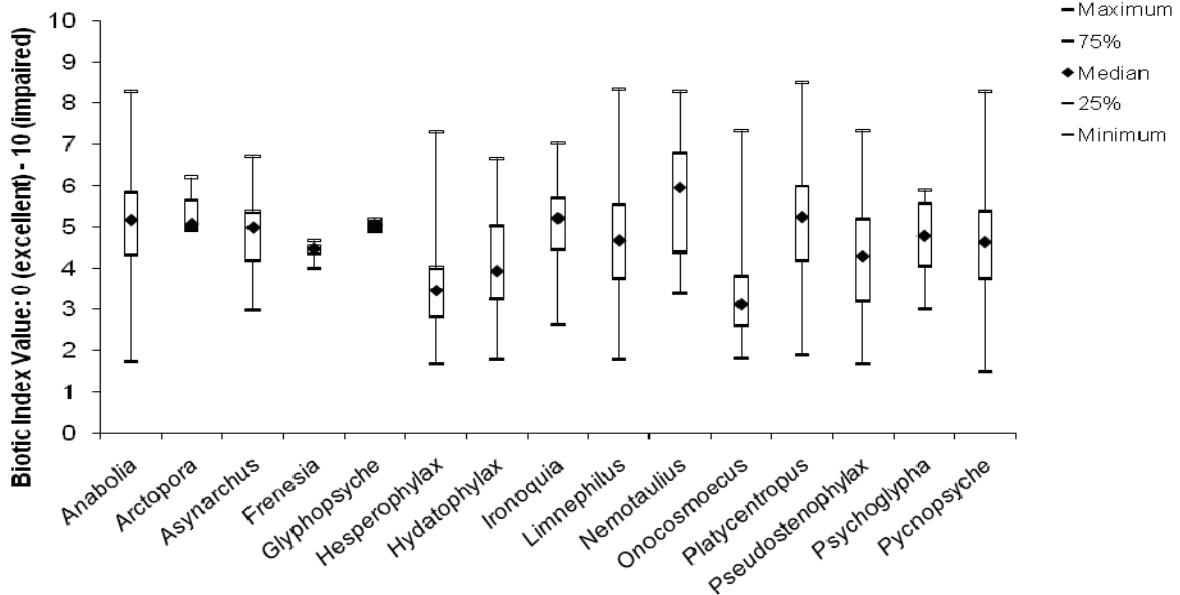
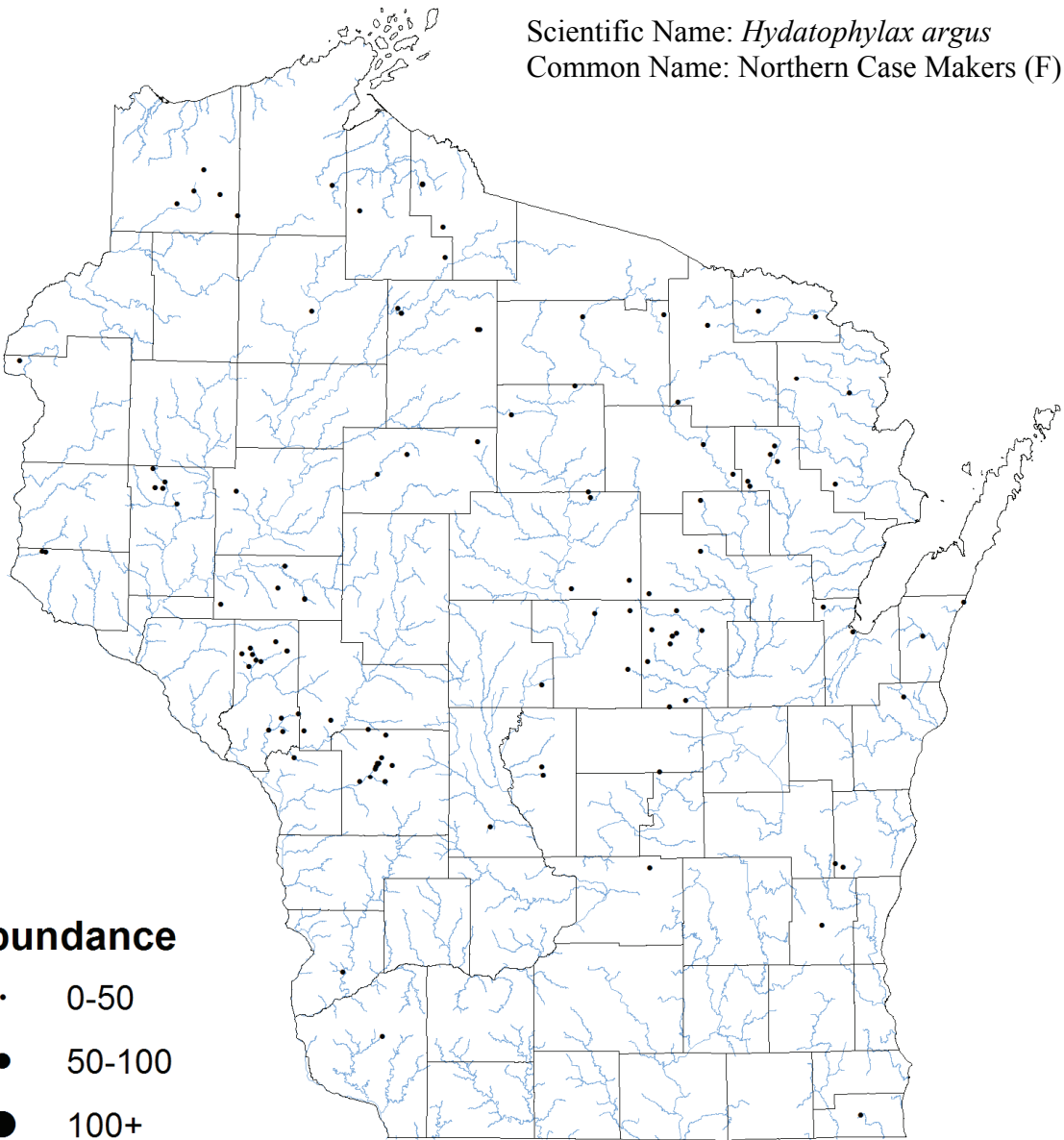


# Trichoptera Limnephilidae

Scientific Name: *Hydatophylax argus*  
 Common Name: Northern Case Makers (F)

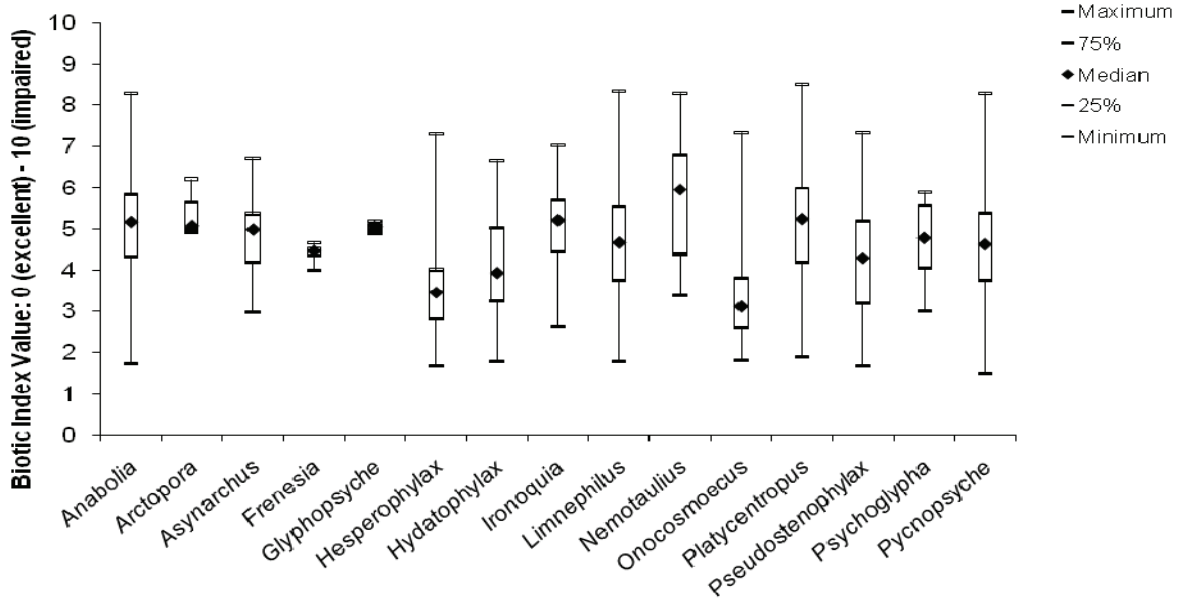
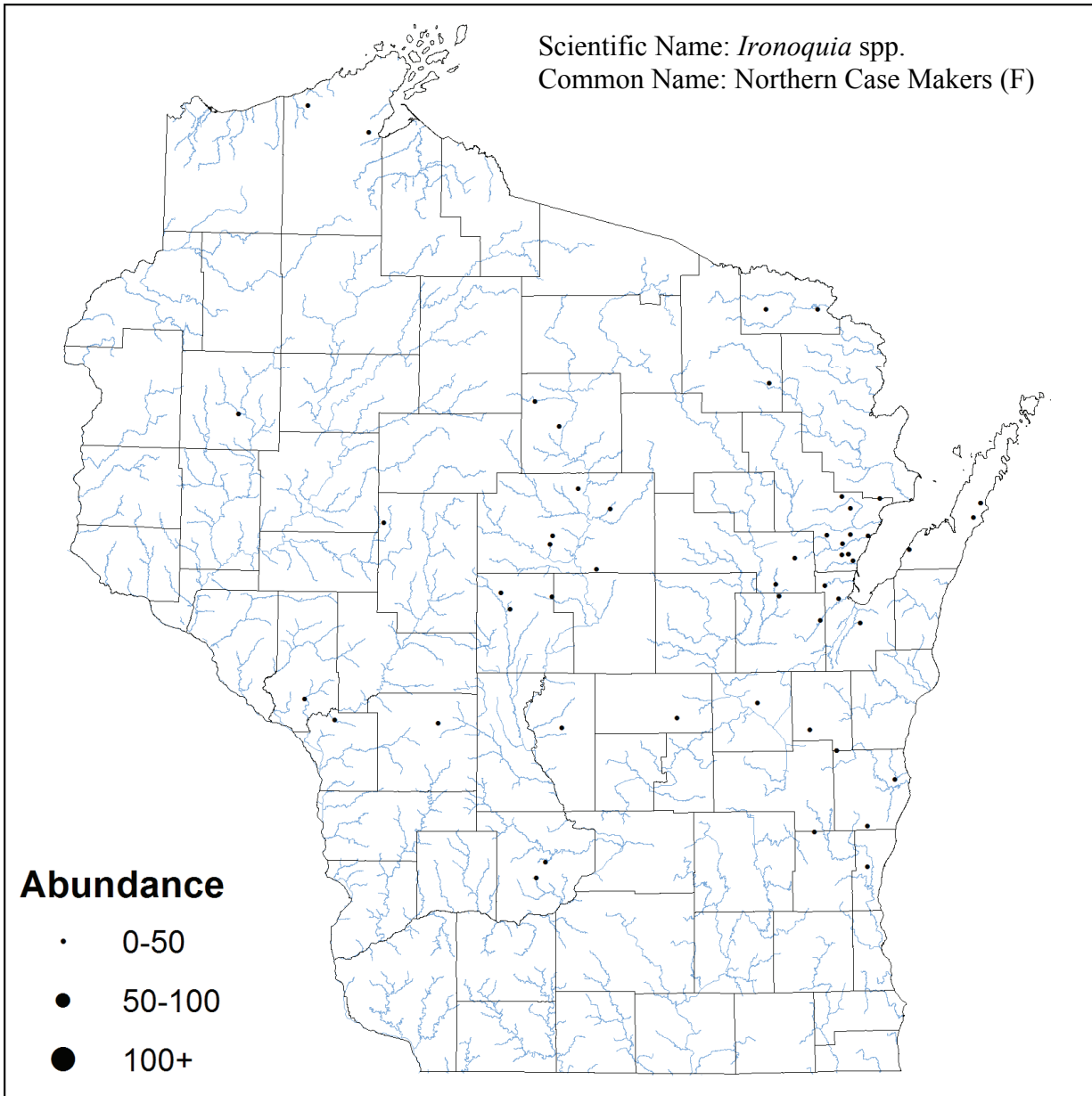
## Abundance

- 0-50
- 50-100
- 100+





# Trichoptera Limnephilidae

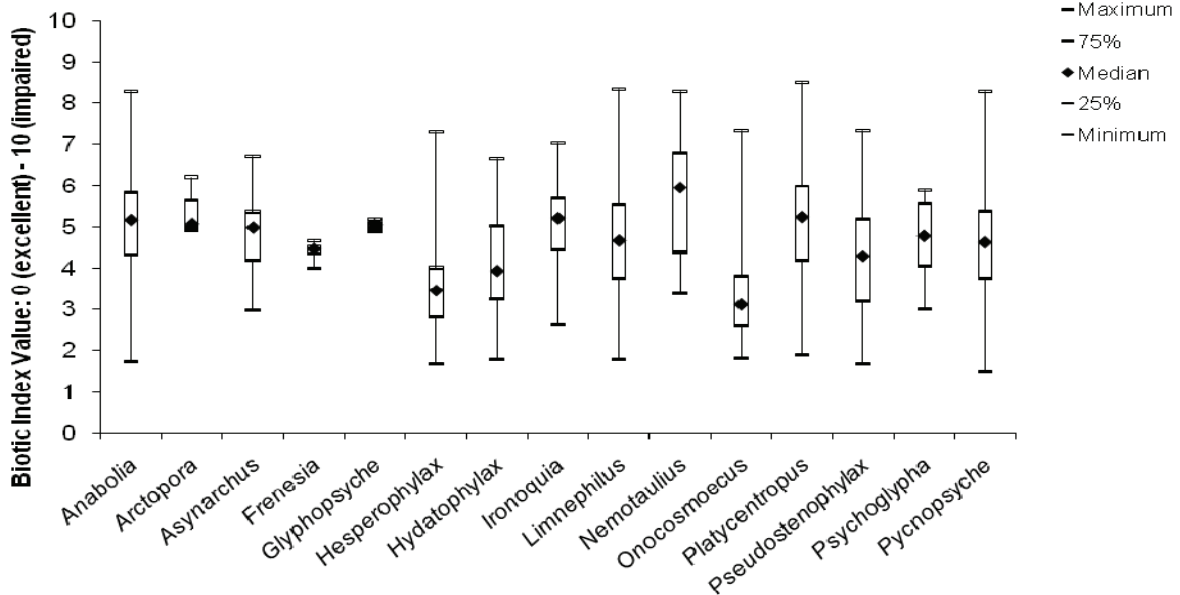
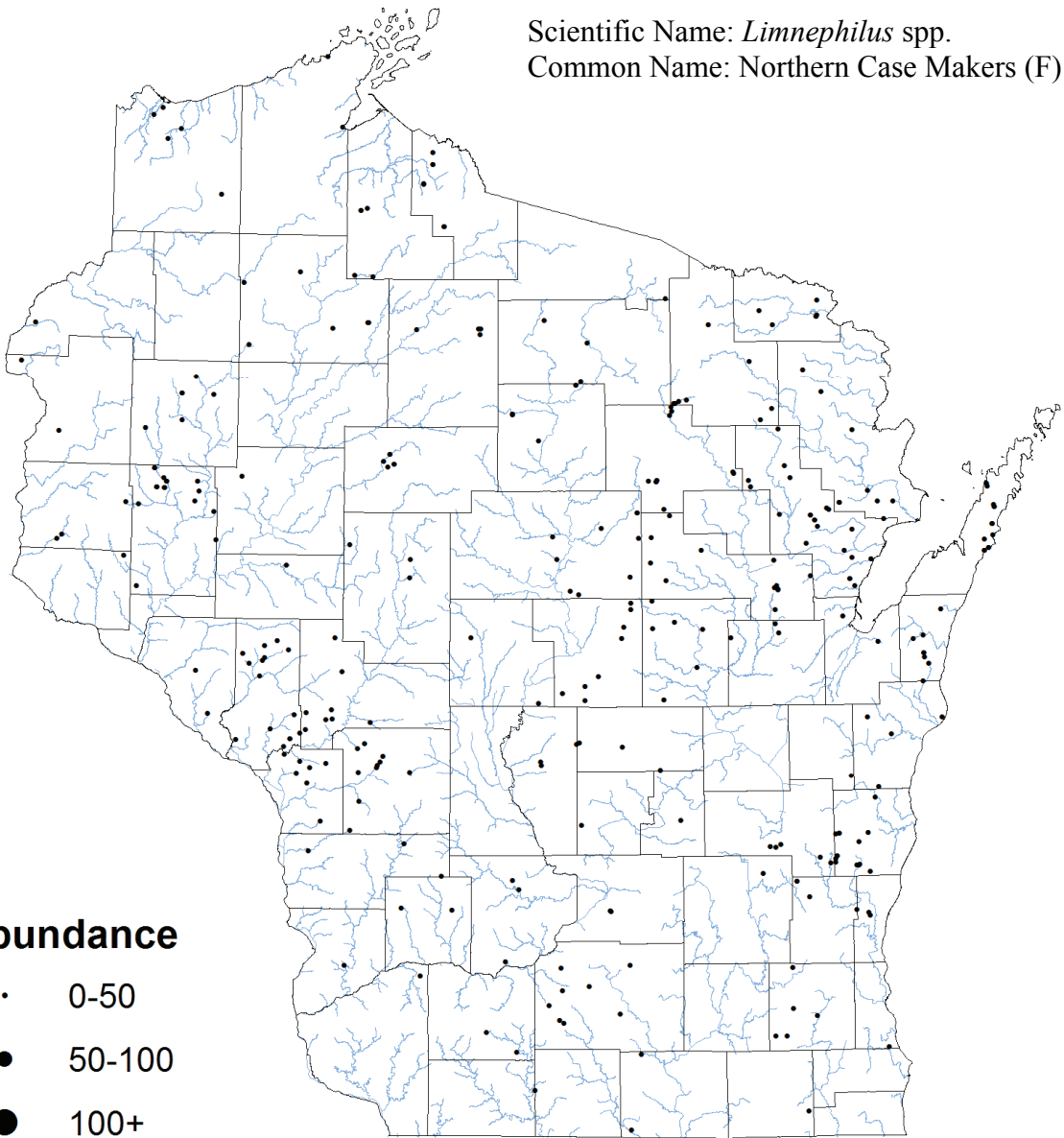


# Trichoptera Limnephilidae

Scientific Name: *Limnephilus* spp.  
 Common Name: Northern Case Makers (F)

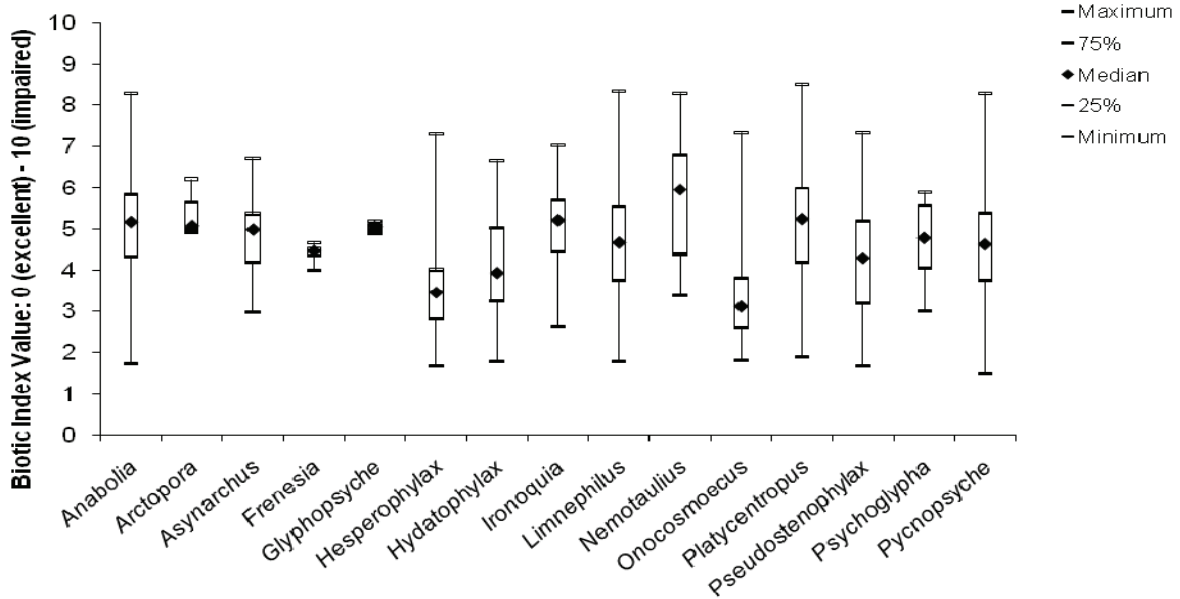
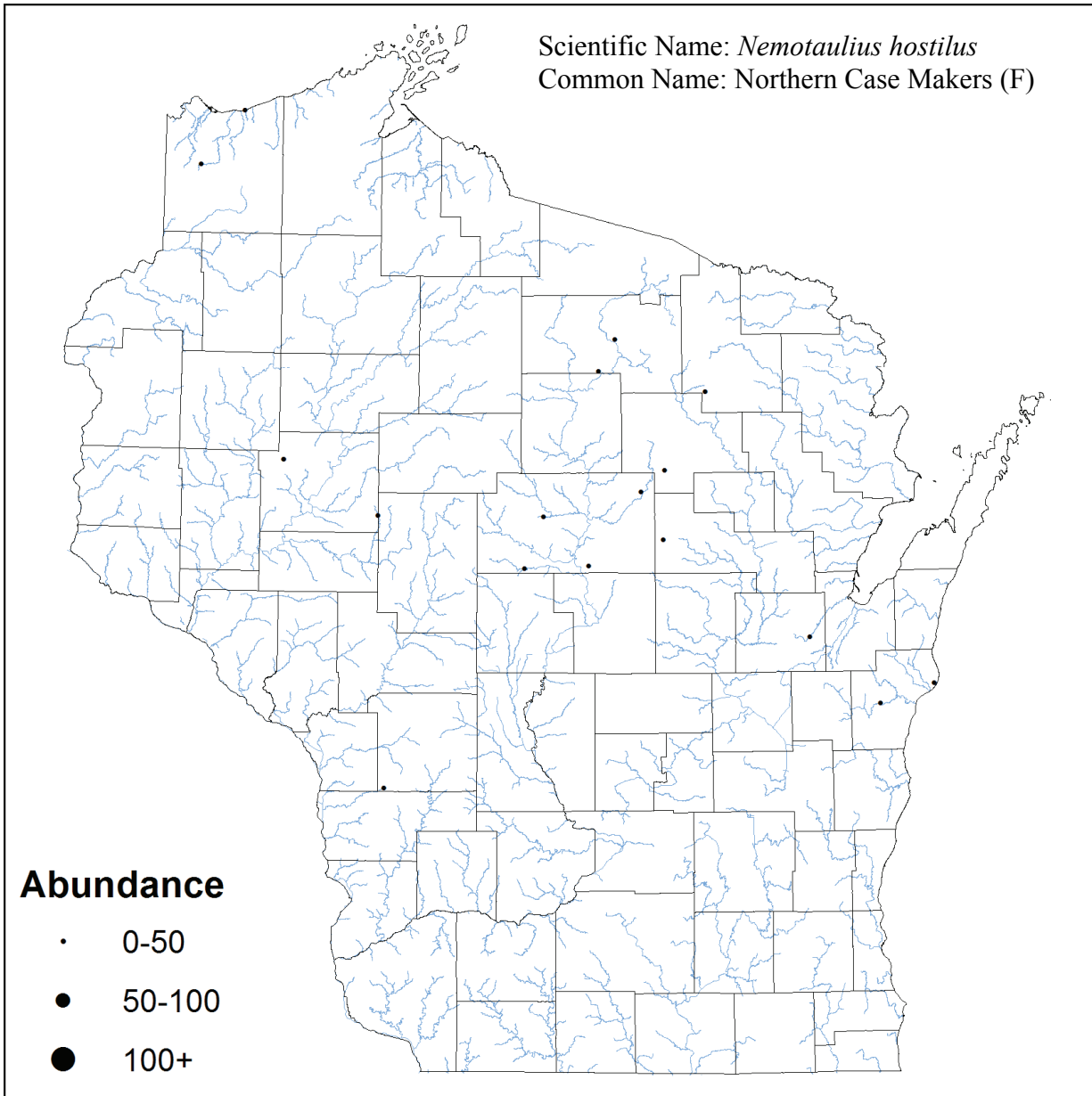
## Abundance

- 0-50
- 50-100
- 100+

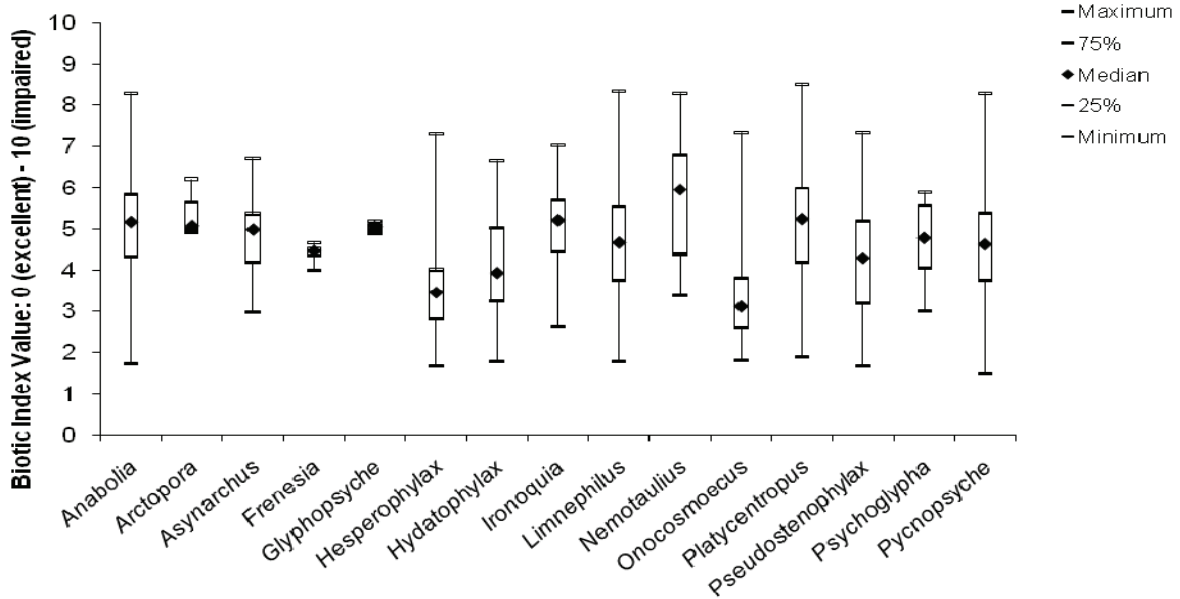
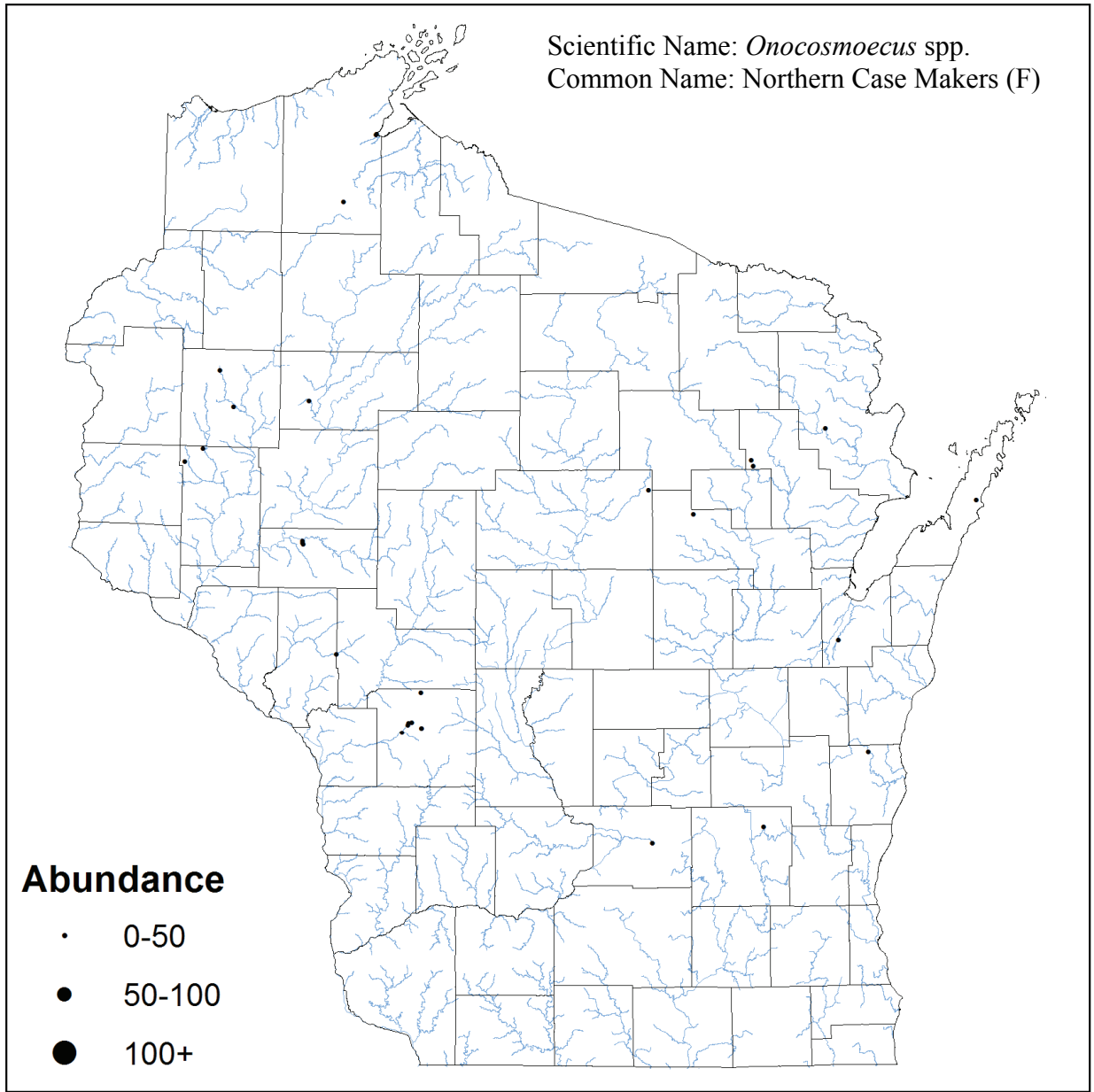


# Trichoptera Limnephilidae

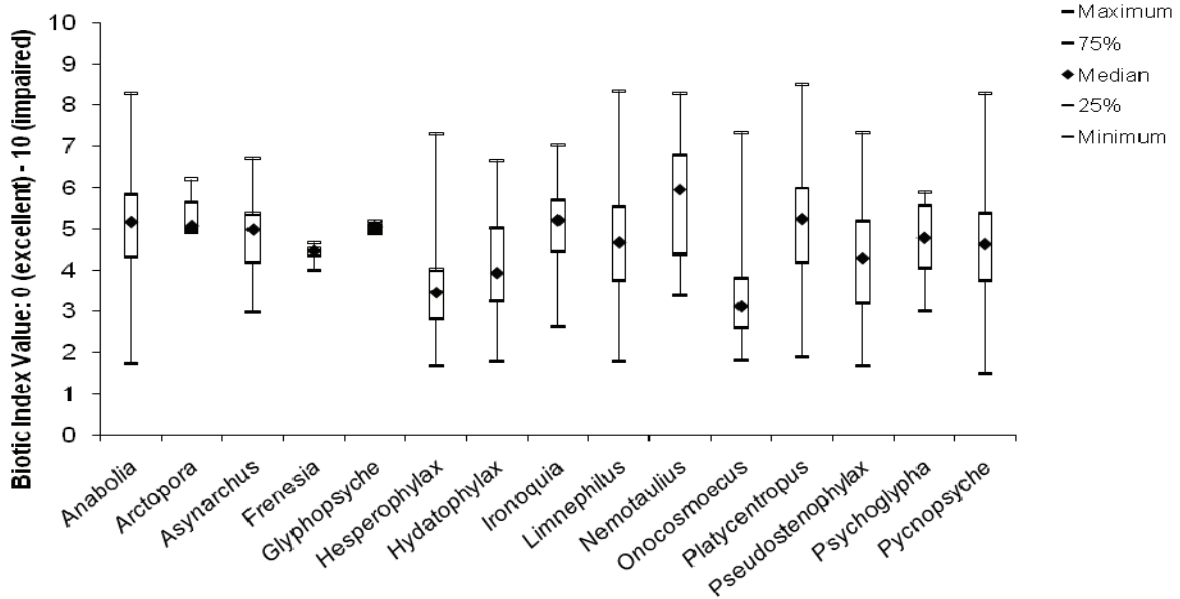
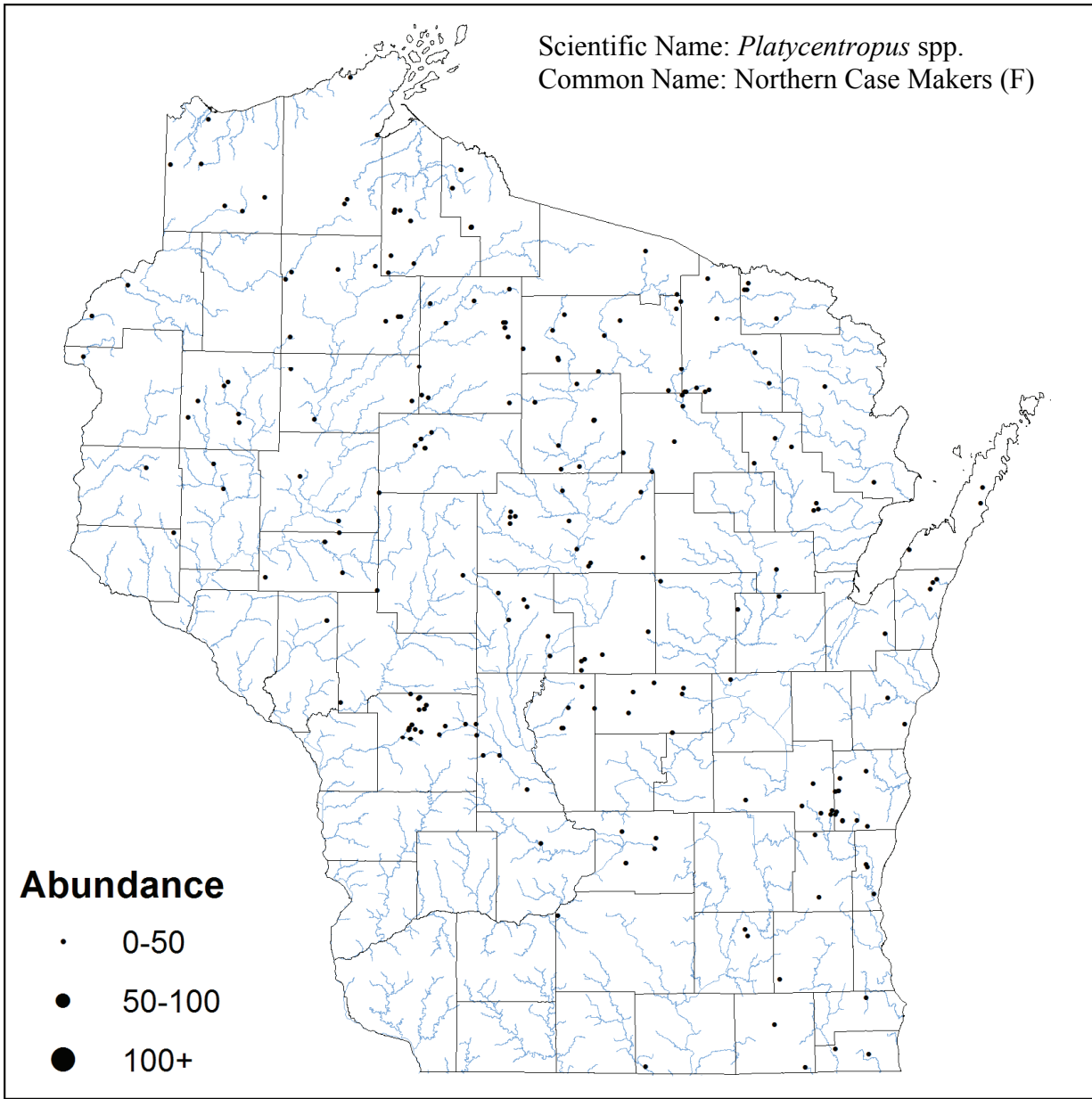
Scientific Name: *Nemotaulius hostilus*  
 Common Name: Northern Case Makers (F)



# Trichoptera Limnephilidae



# Trichoptera Limnephilidae

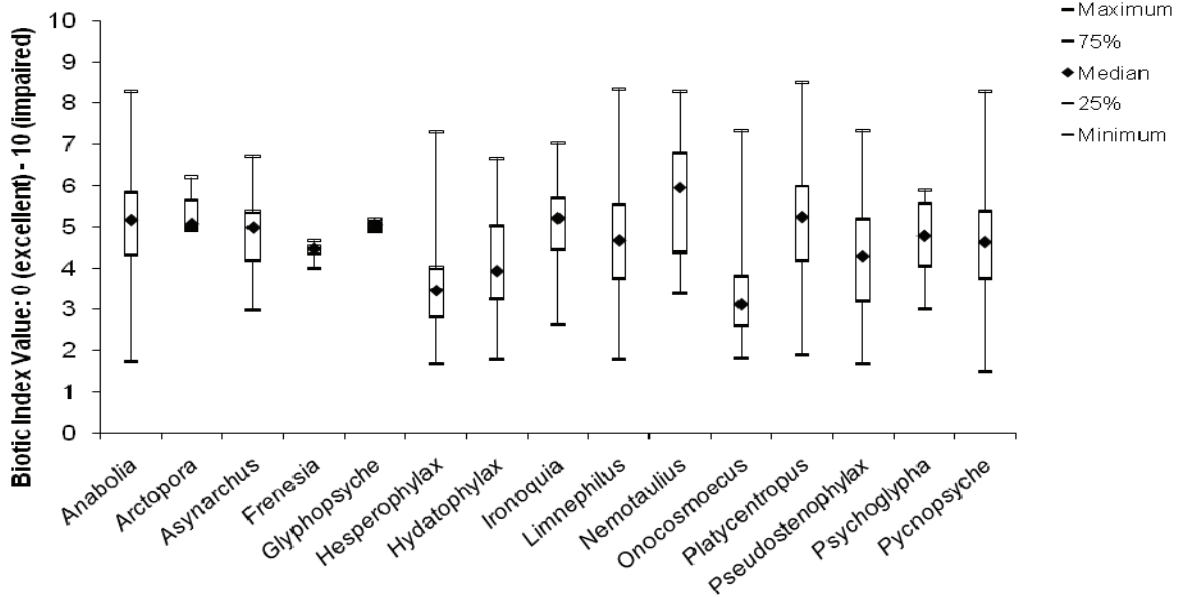
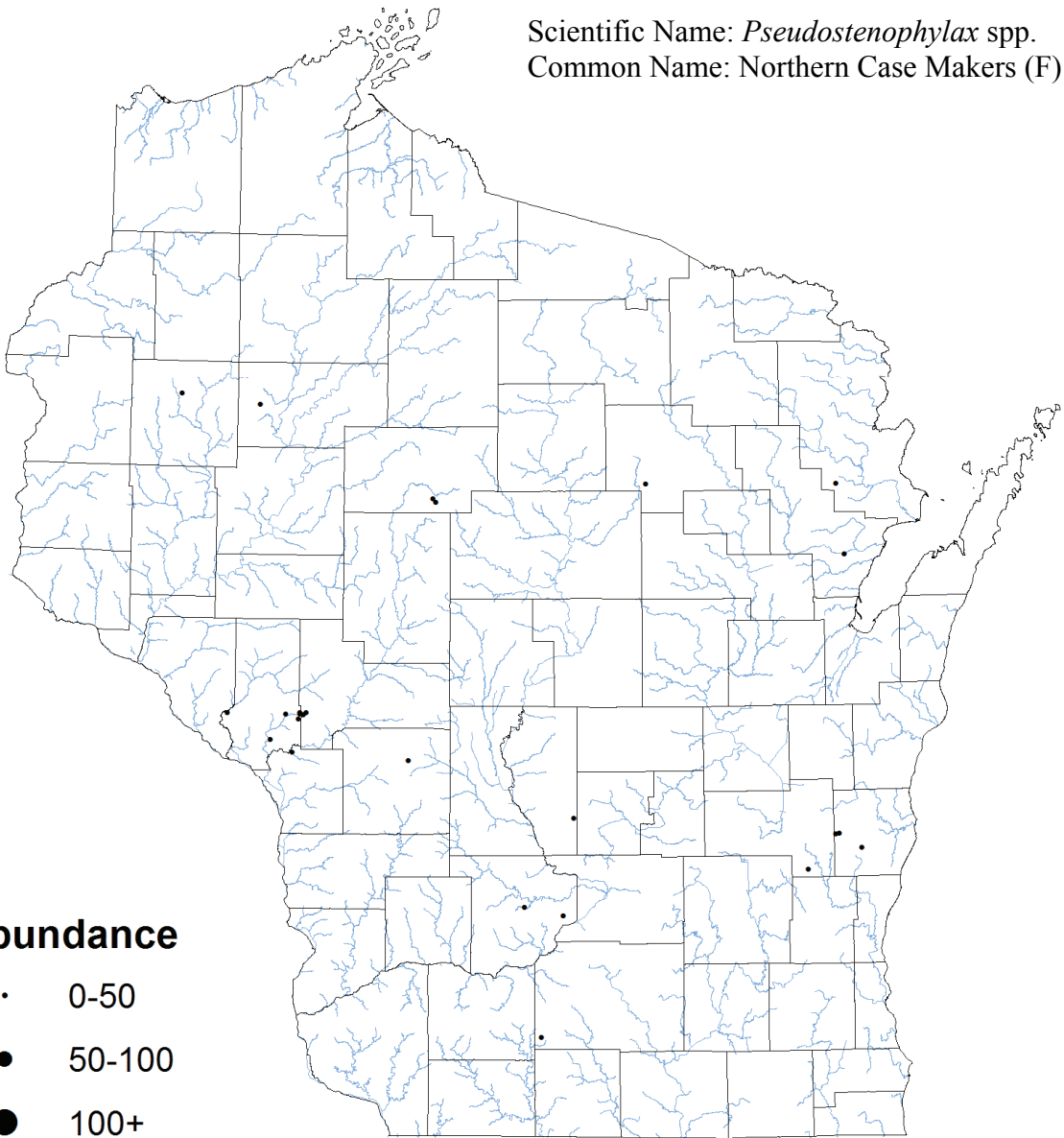


# Trichoptera Limnephilidae

Scientific Name: *Pseudostenophylax* spp.  
 Common Name: Northern Case Makers (F)

## Abundance

- 0-50
- 50-100
- 100+

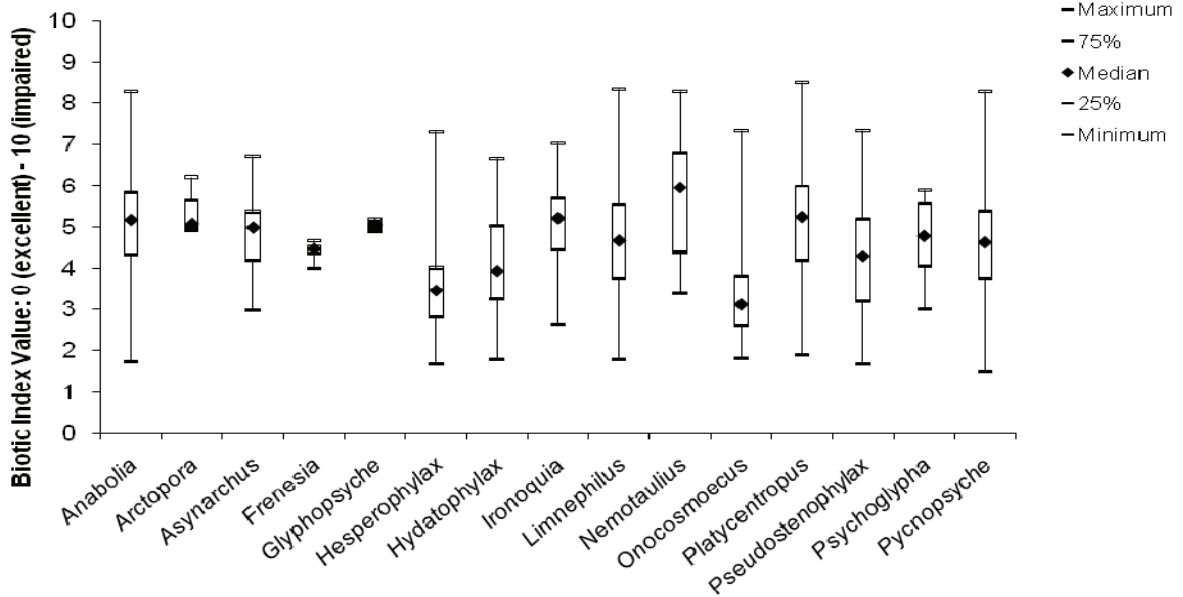
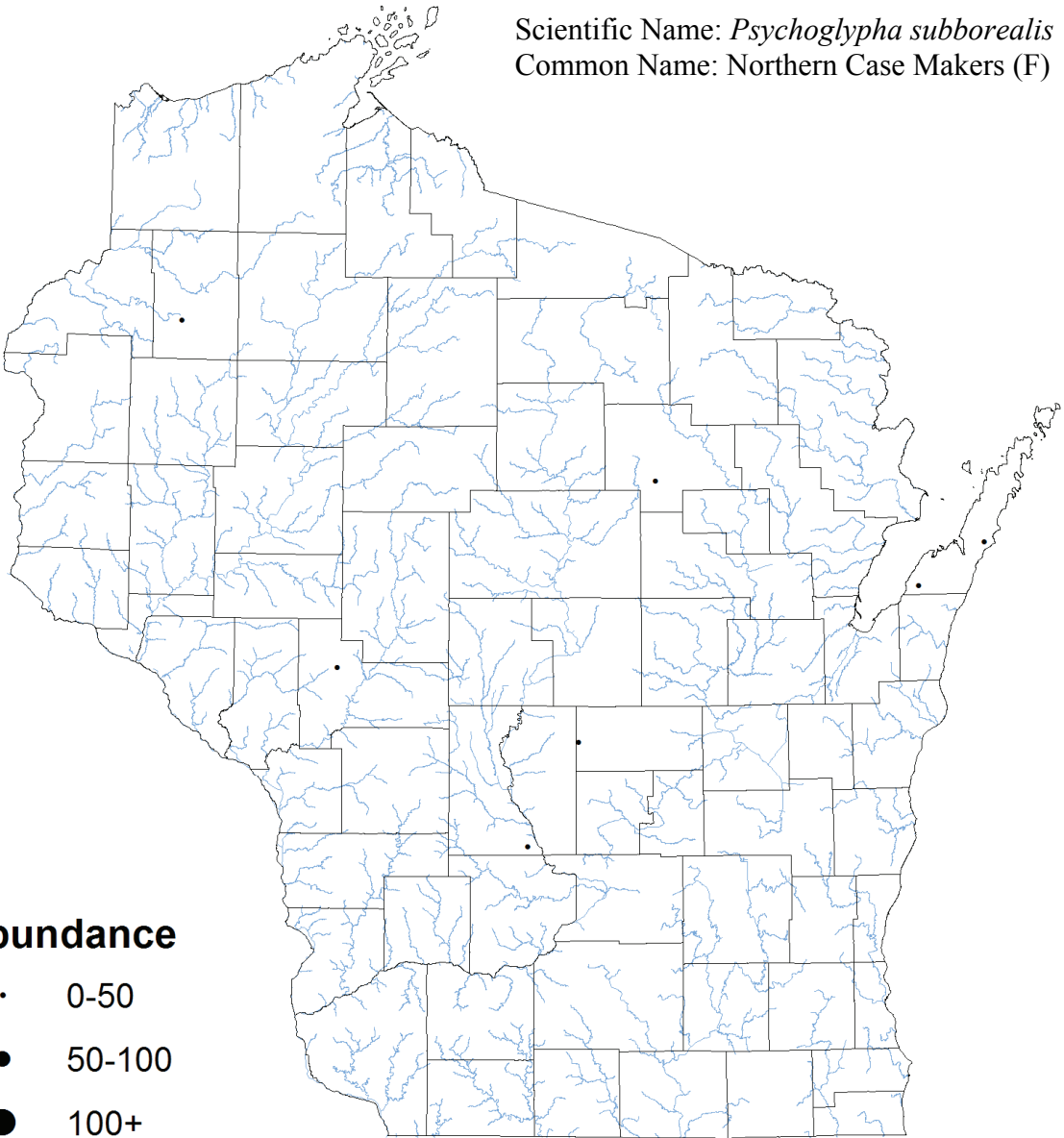


# Trichoptera Limnephilidae

Scientific Name: *Psychoglypha subborealis*  
 Common Name: Northern Case Makers (F)

## Abundance

- 0-50
- 50-100
- 100+

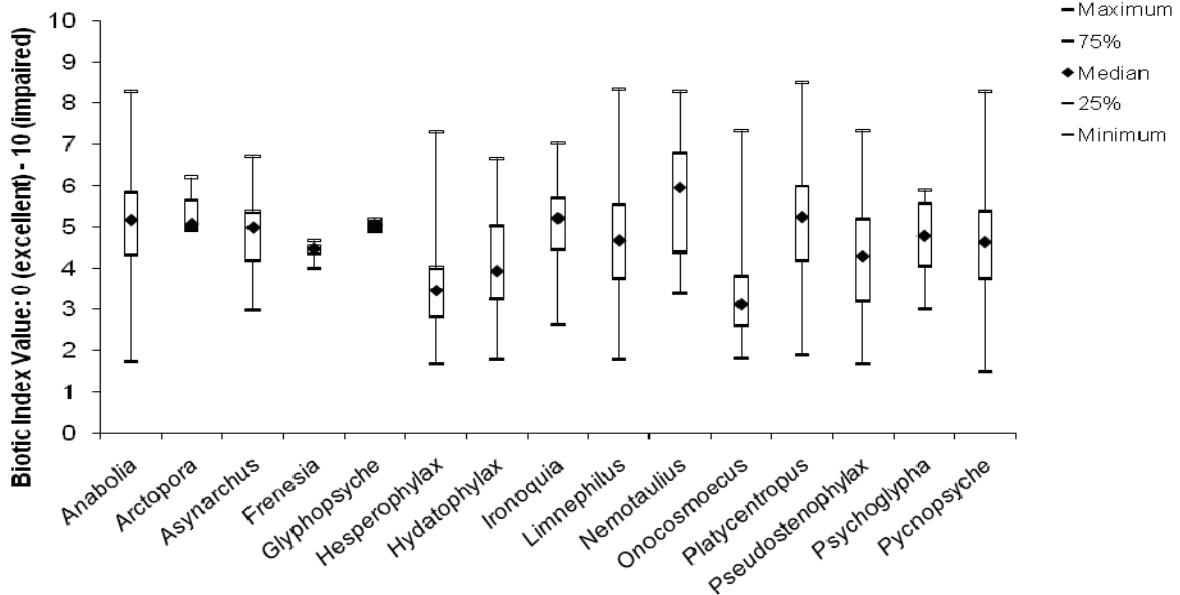
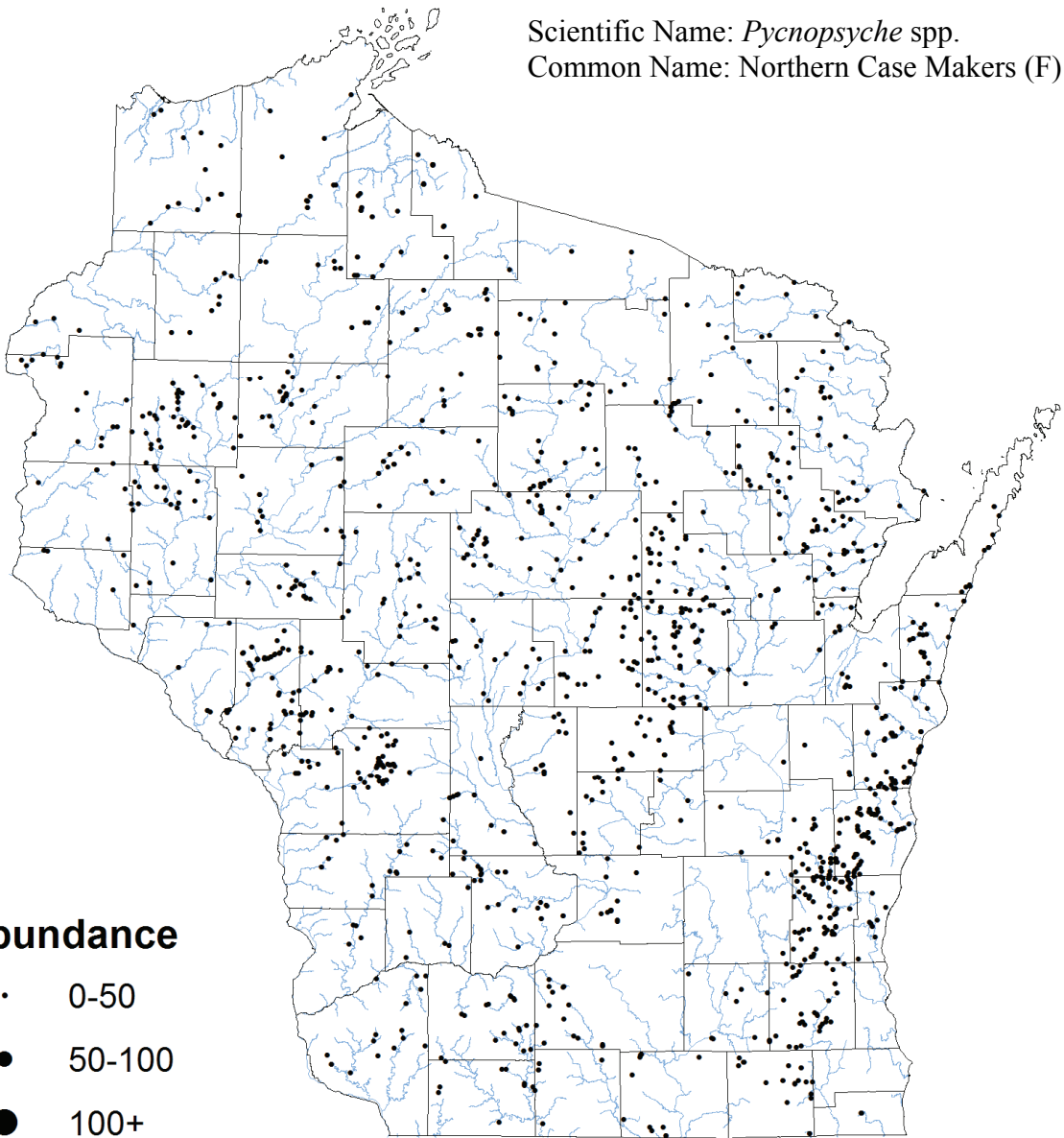


# Trichoptera Limnephilidae

Scientific Name: *Pycnopsyche* spp.  
 Common Name: Northern Case Makers (F)

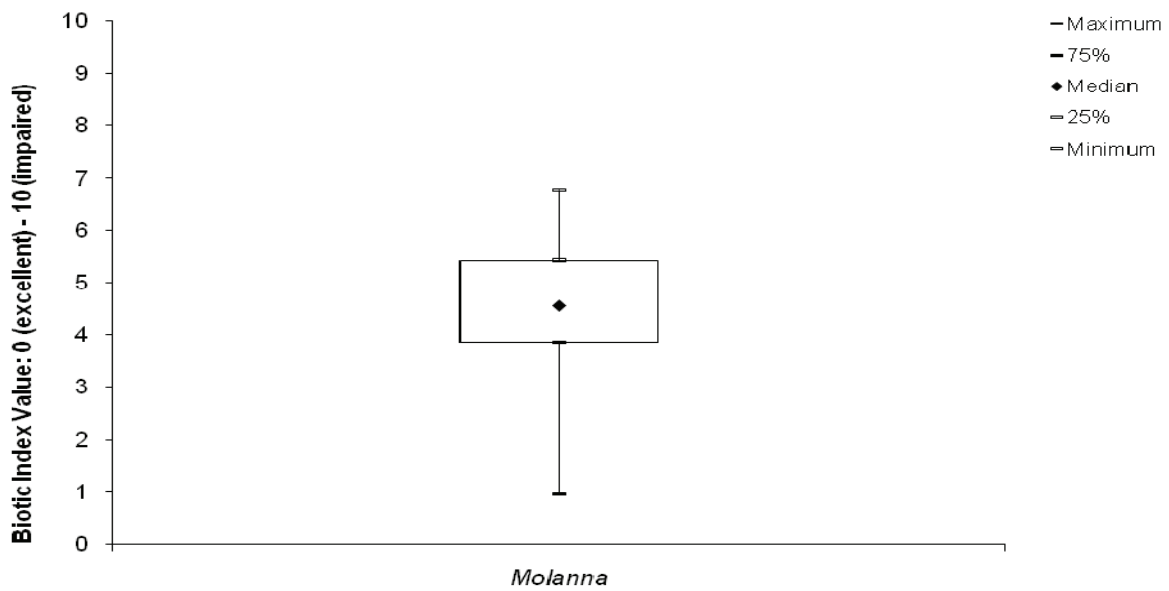
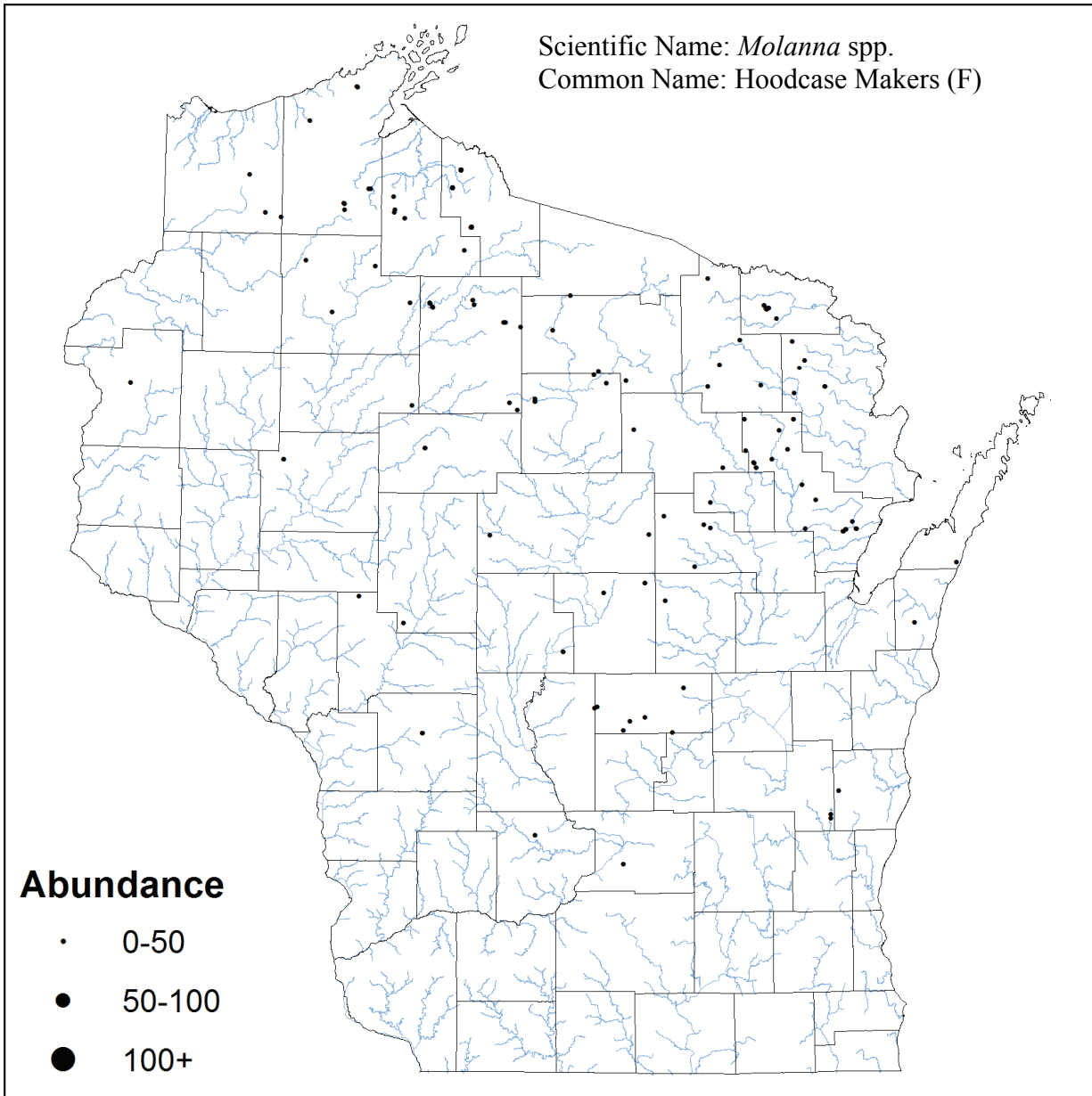
## Abundance

- 0-50
- 50-100
- 100+





# Trichoptera Molannidae

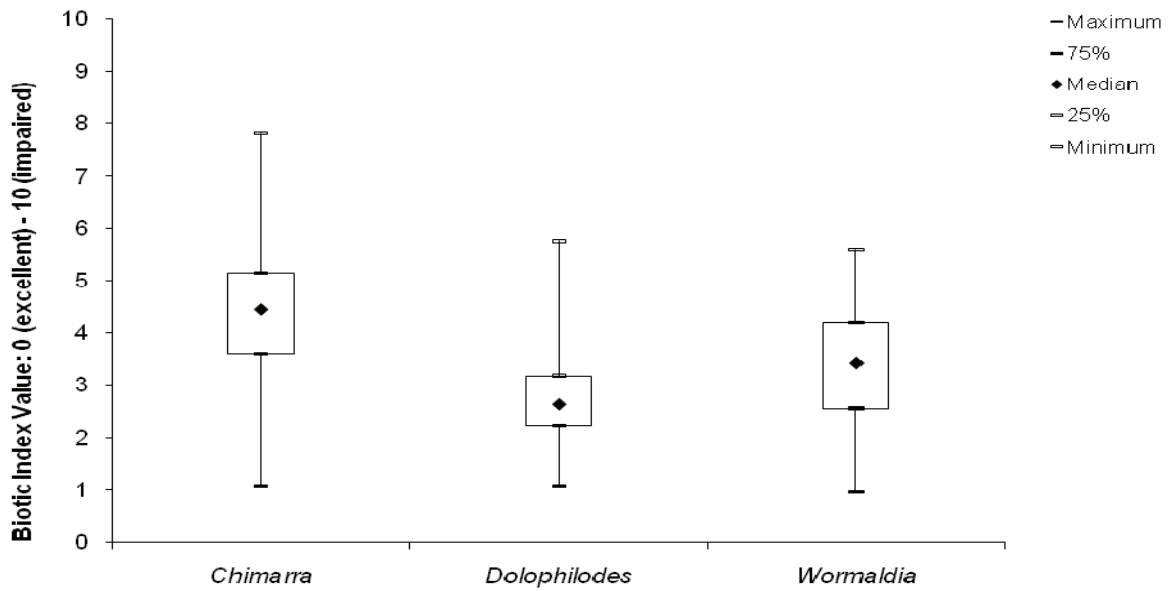
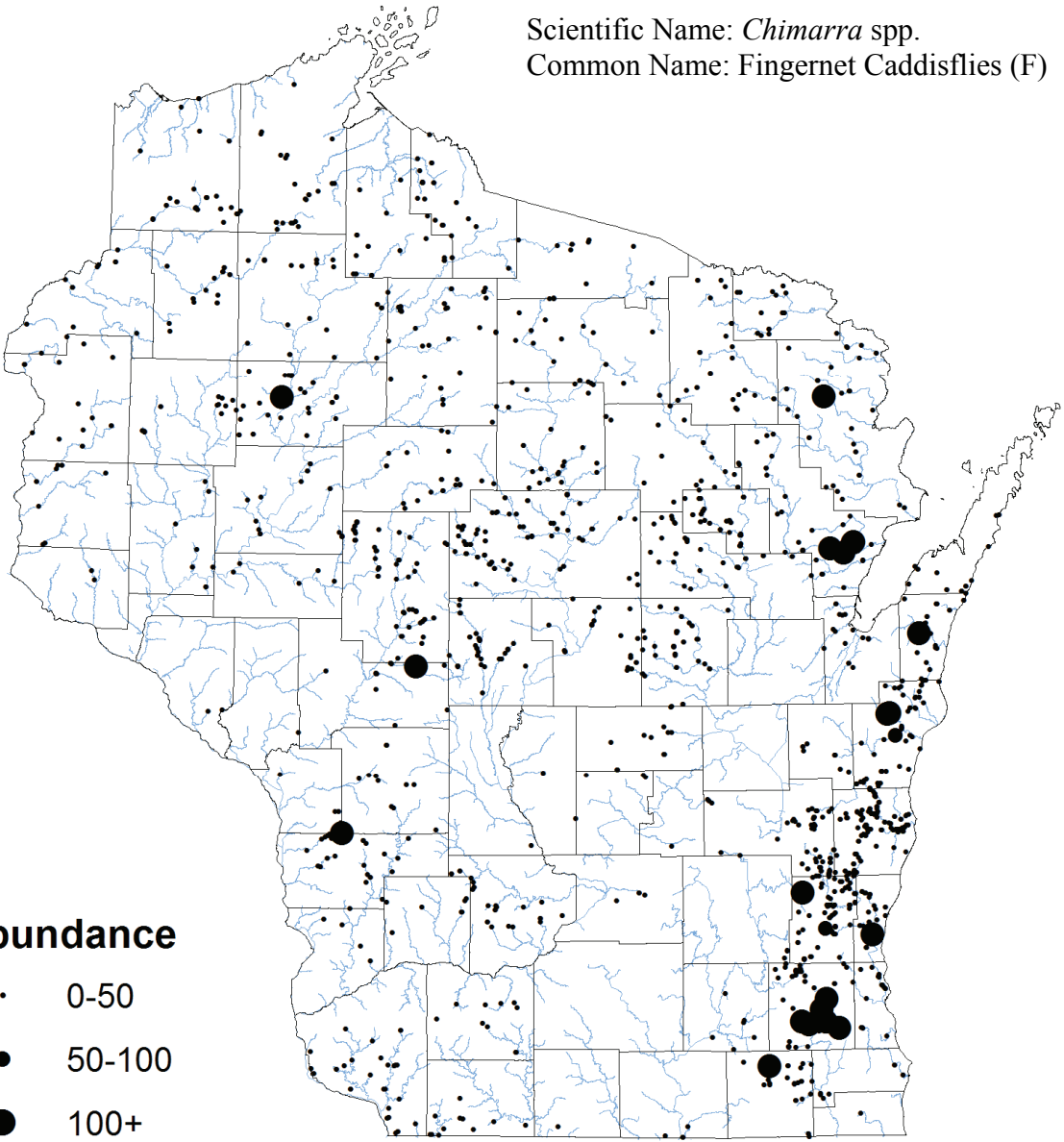


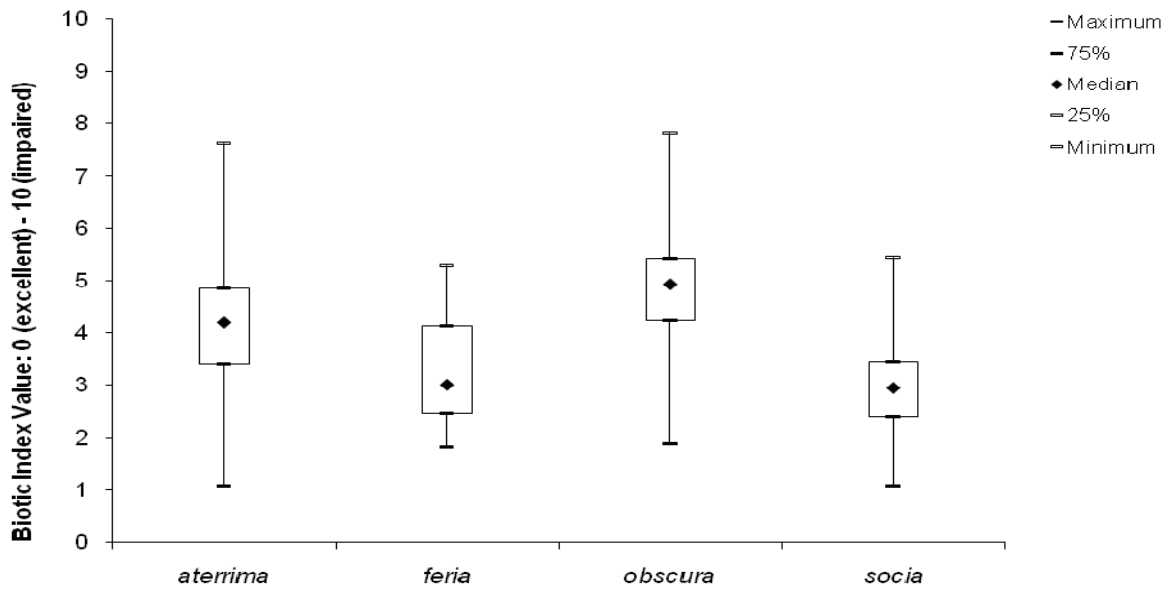
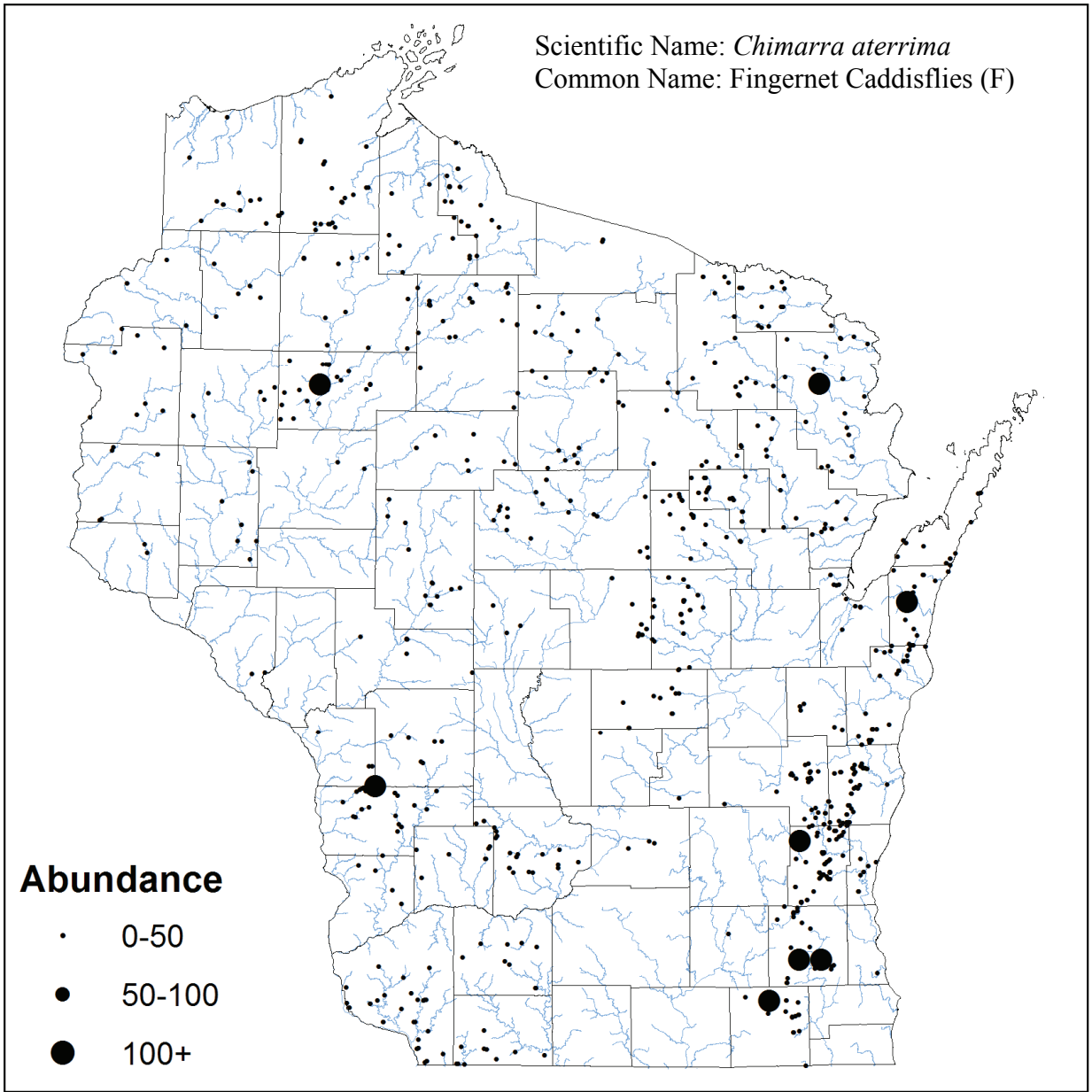
# Trichoptera Philopotamidae

Scientific Name: *Chimarra* spp.  
 Common Name: Fingernet Caddisflies (F)

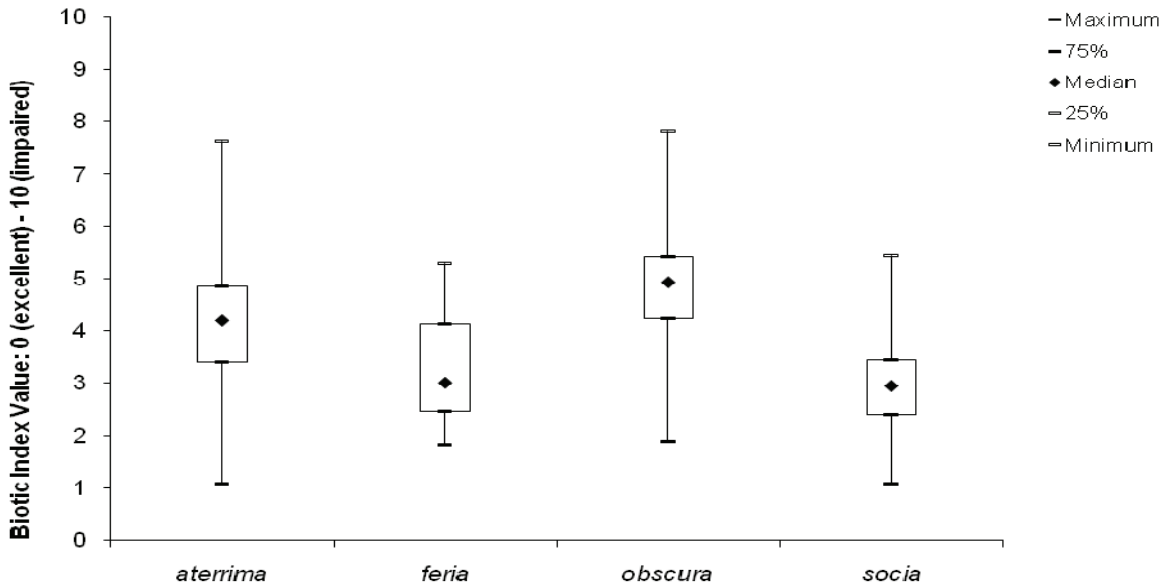
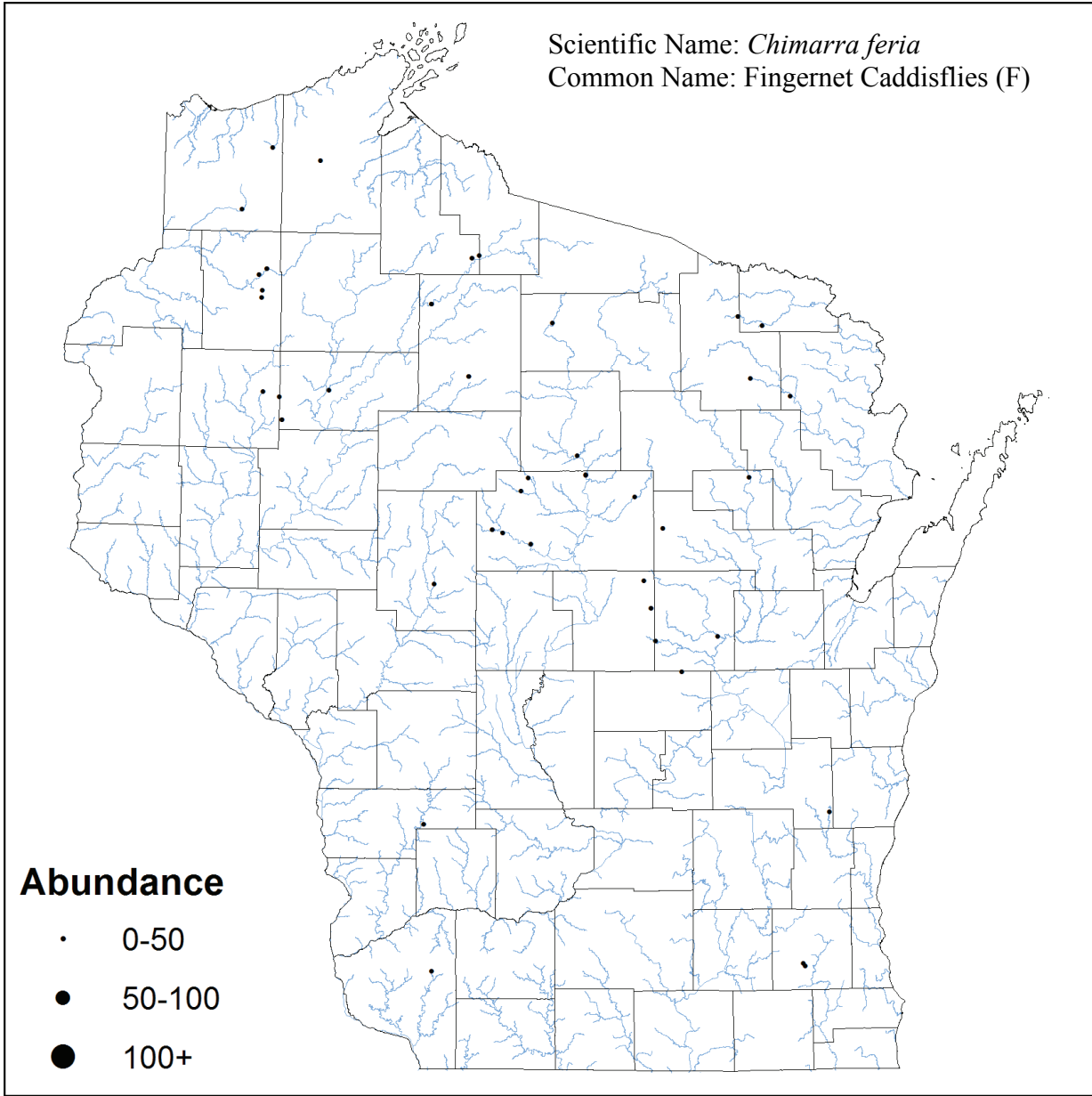
## Abundance

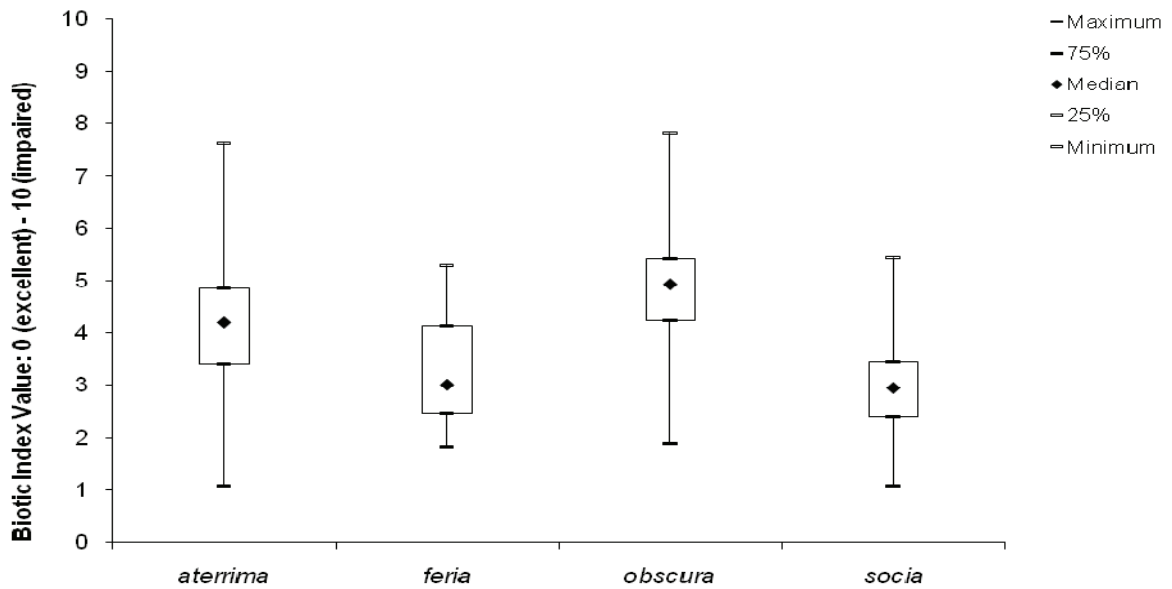
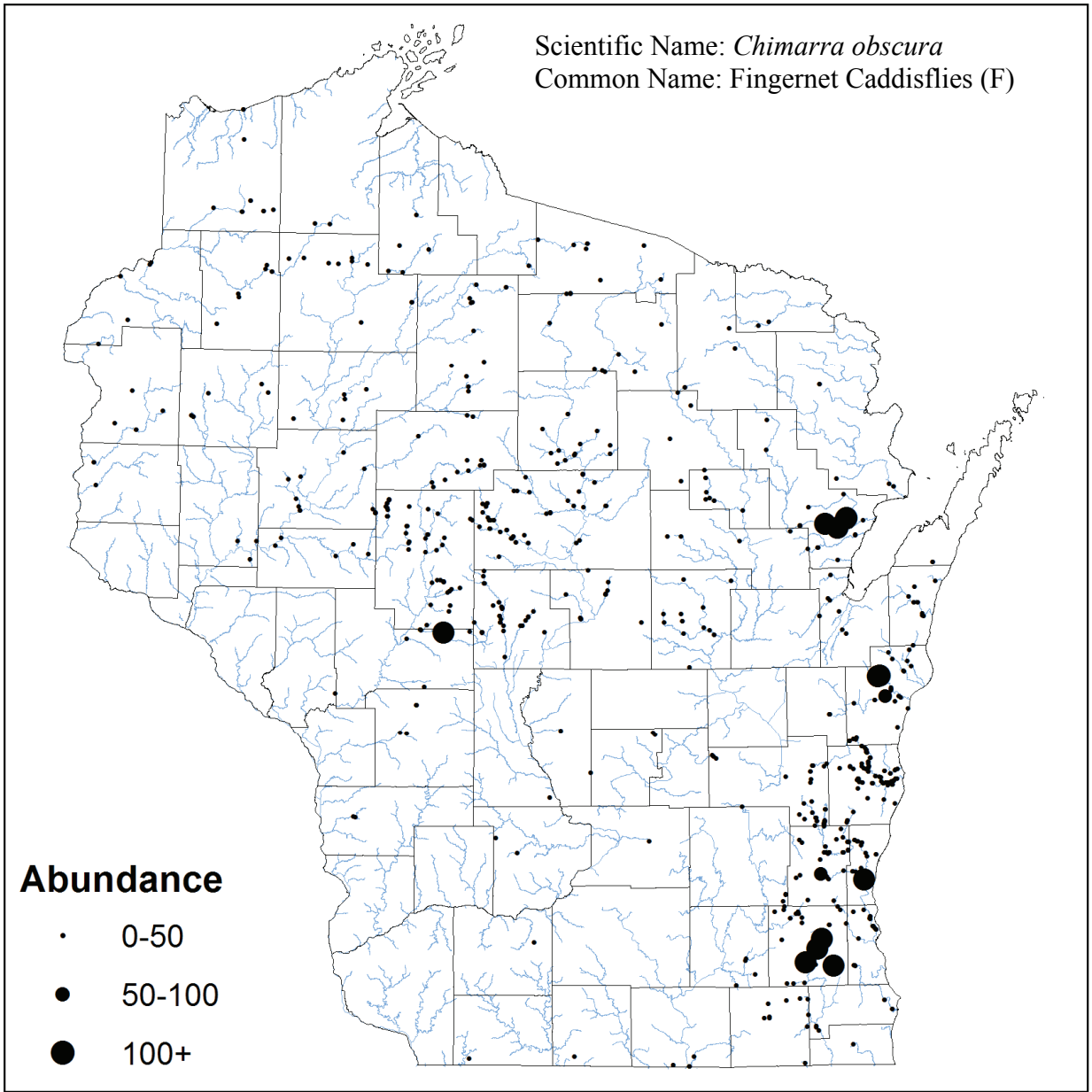
- 0-50
- 50-100
- 100+





# Trichoptera Philopotamidae



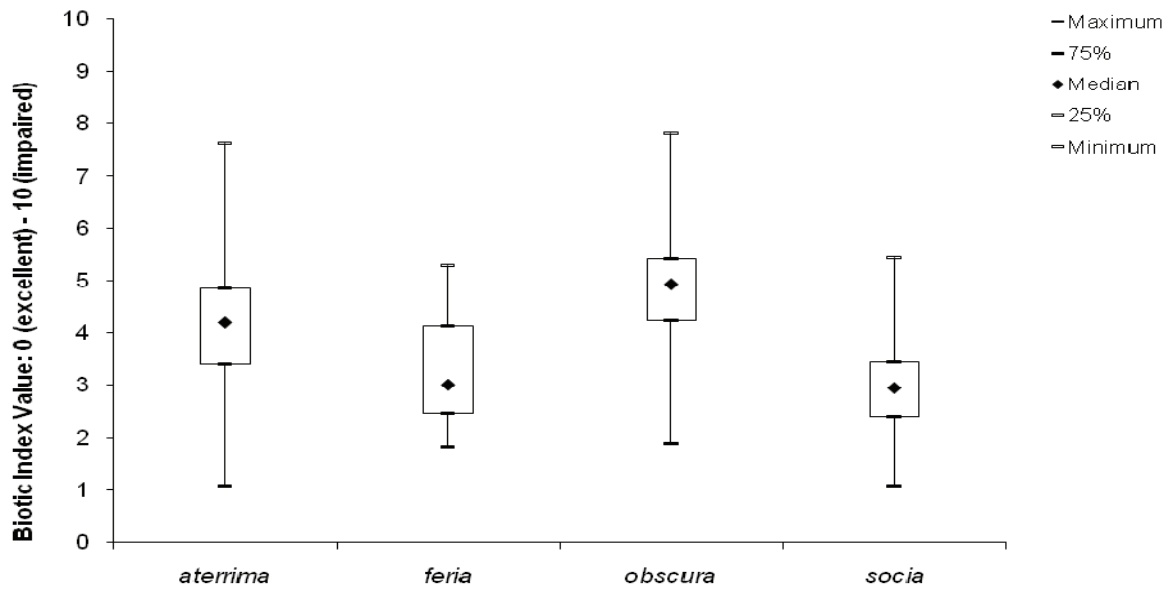
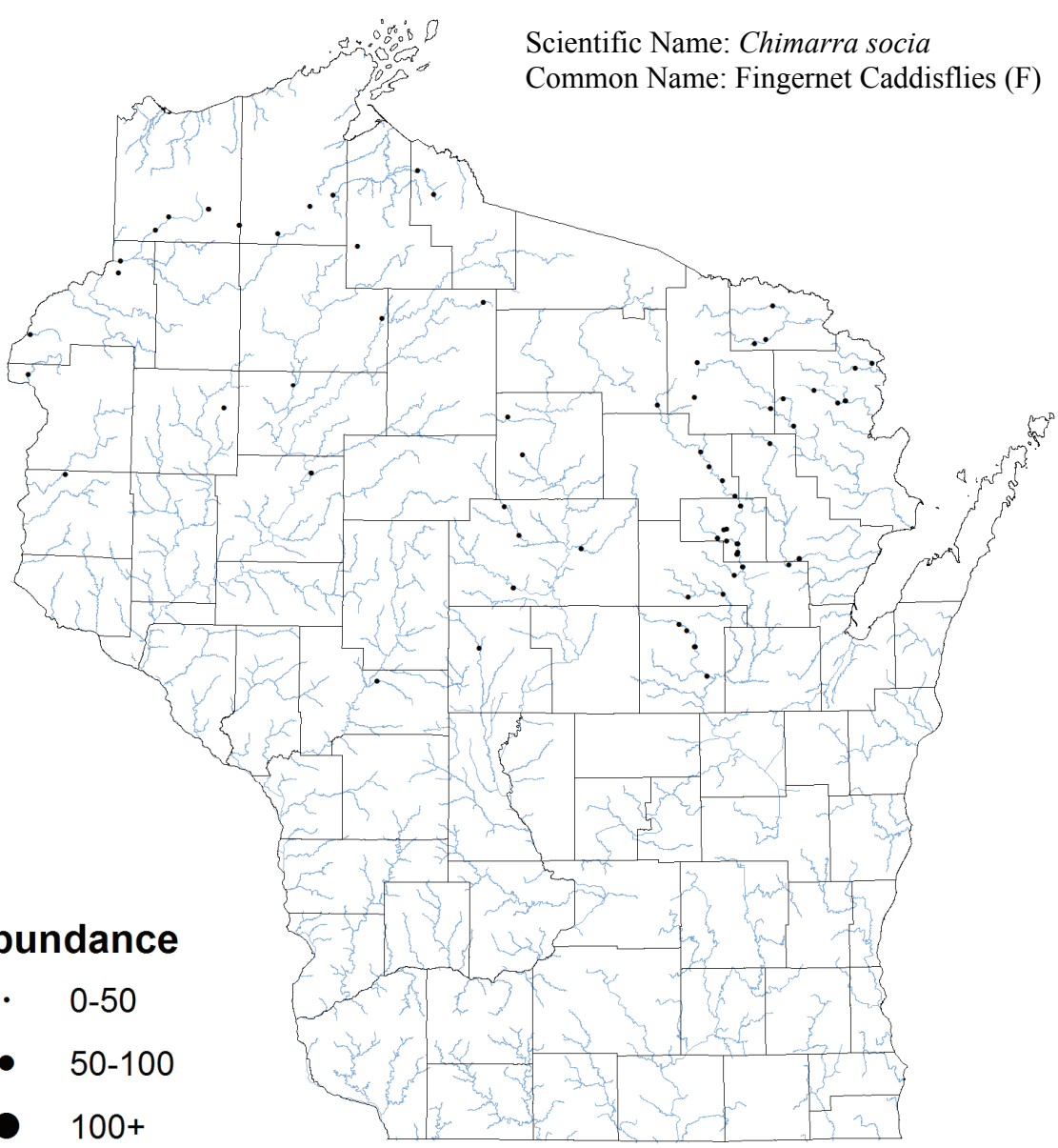


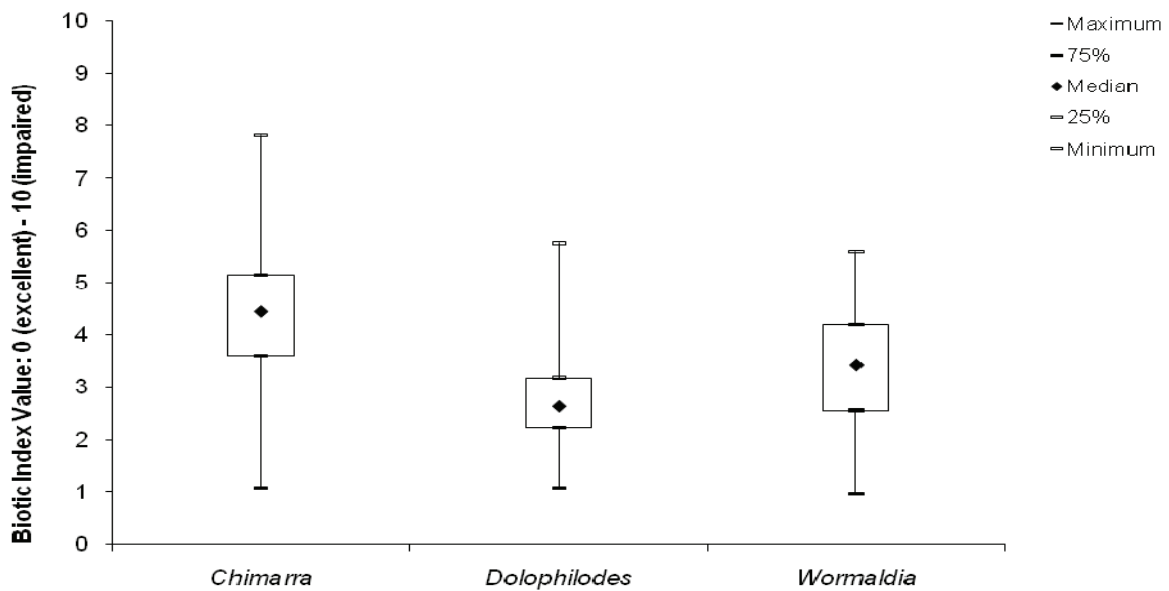
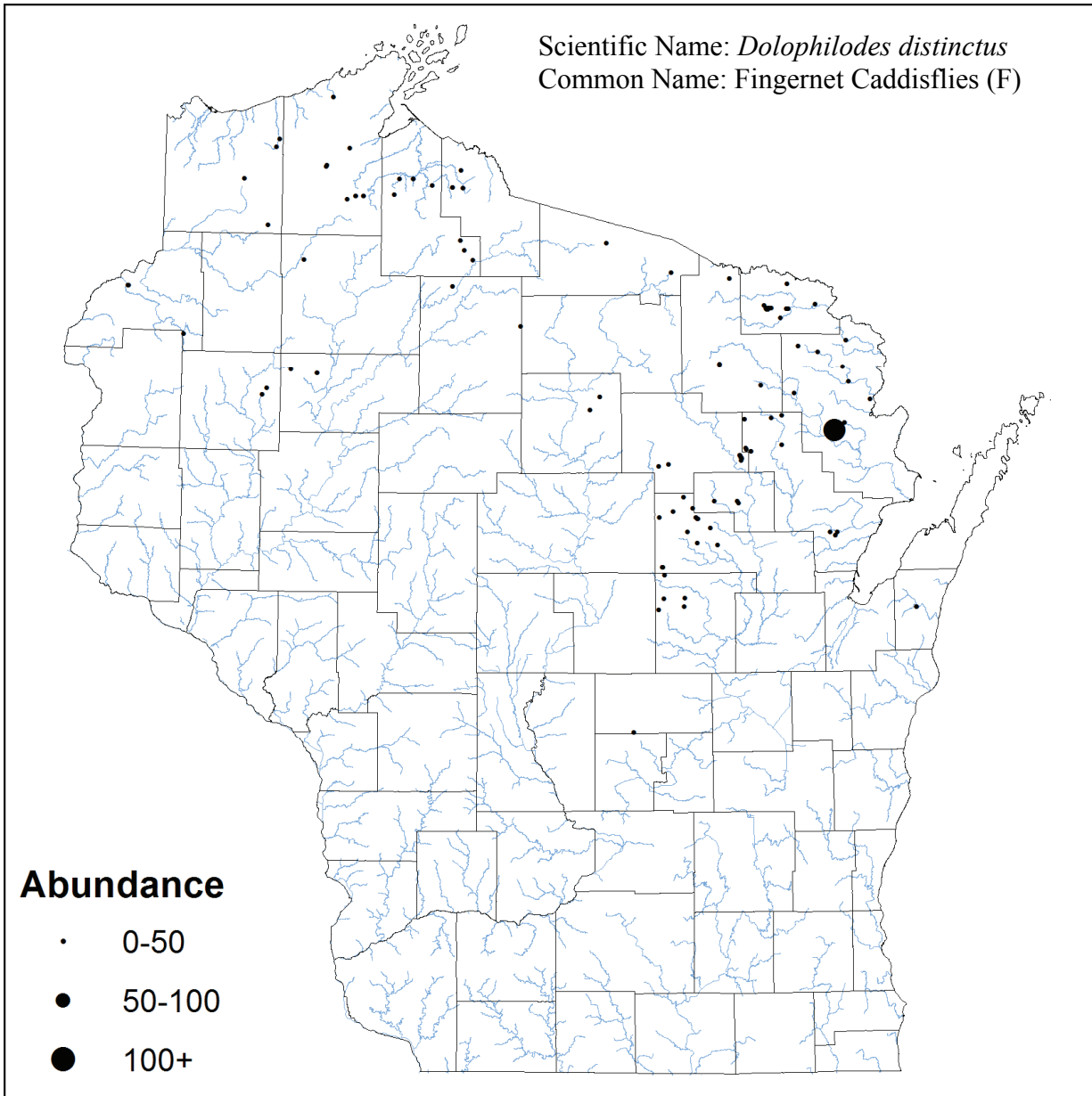
# Trichoptera Philopotamidae

Scientific Name: *Chimarra socia*  
 Common Name: Fingernet Caddisflies (F)

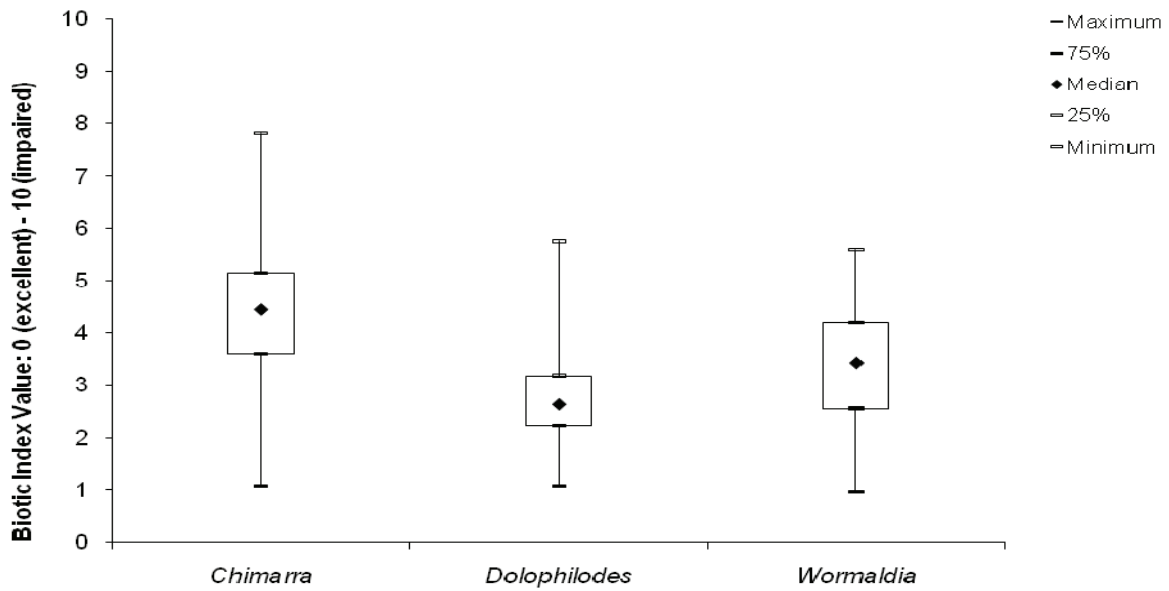
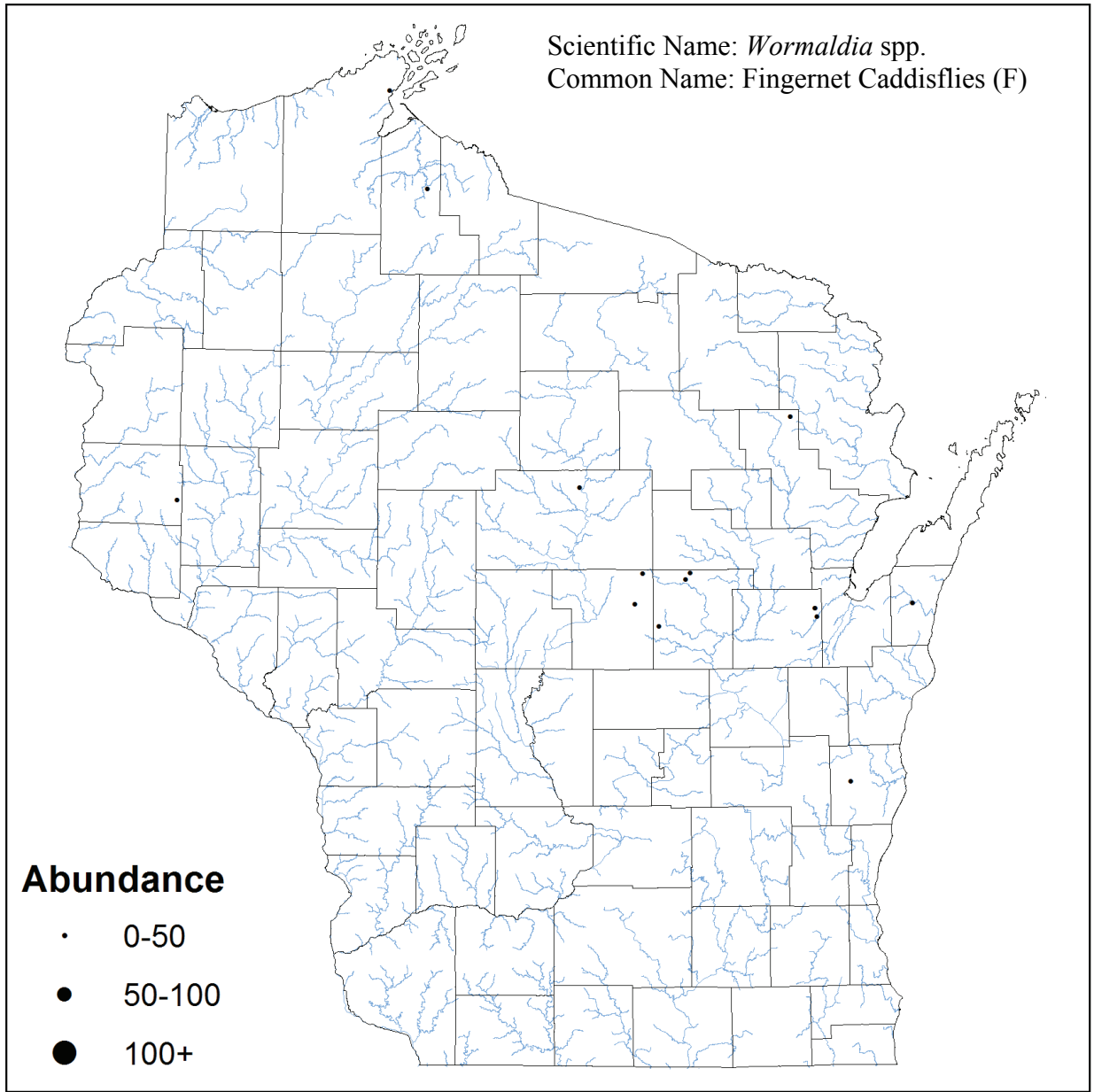
## Abundance

- 0-50
- 50-100
- 100+



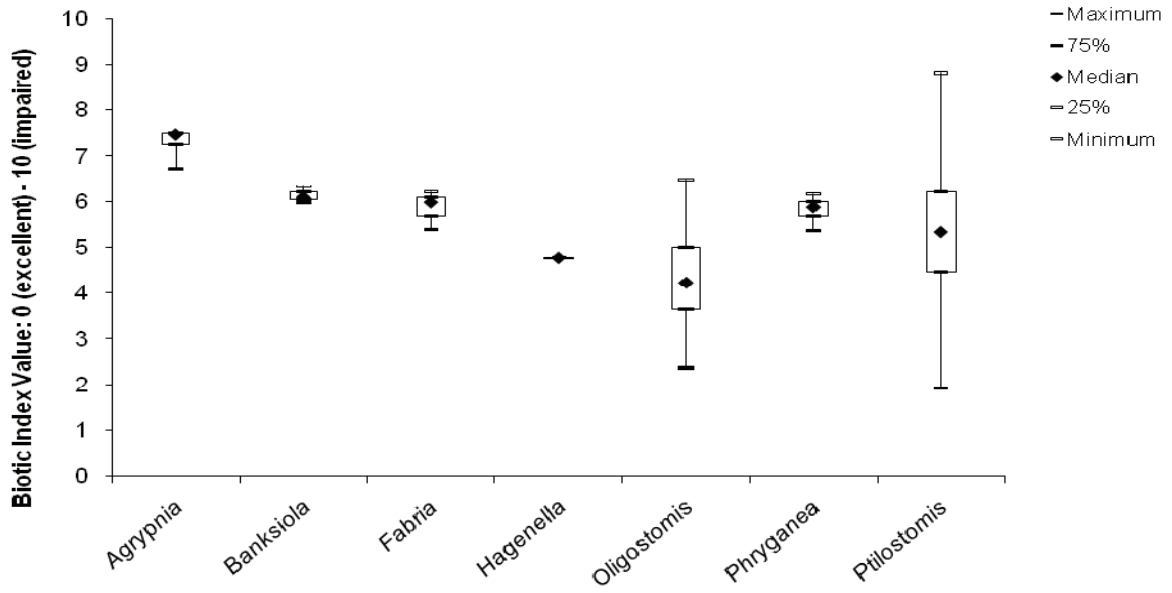
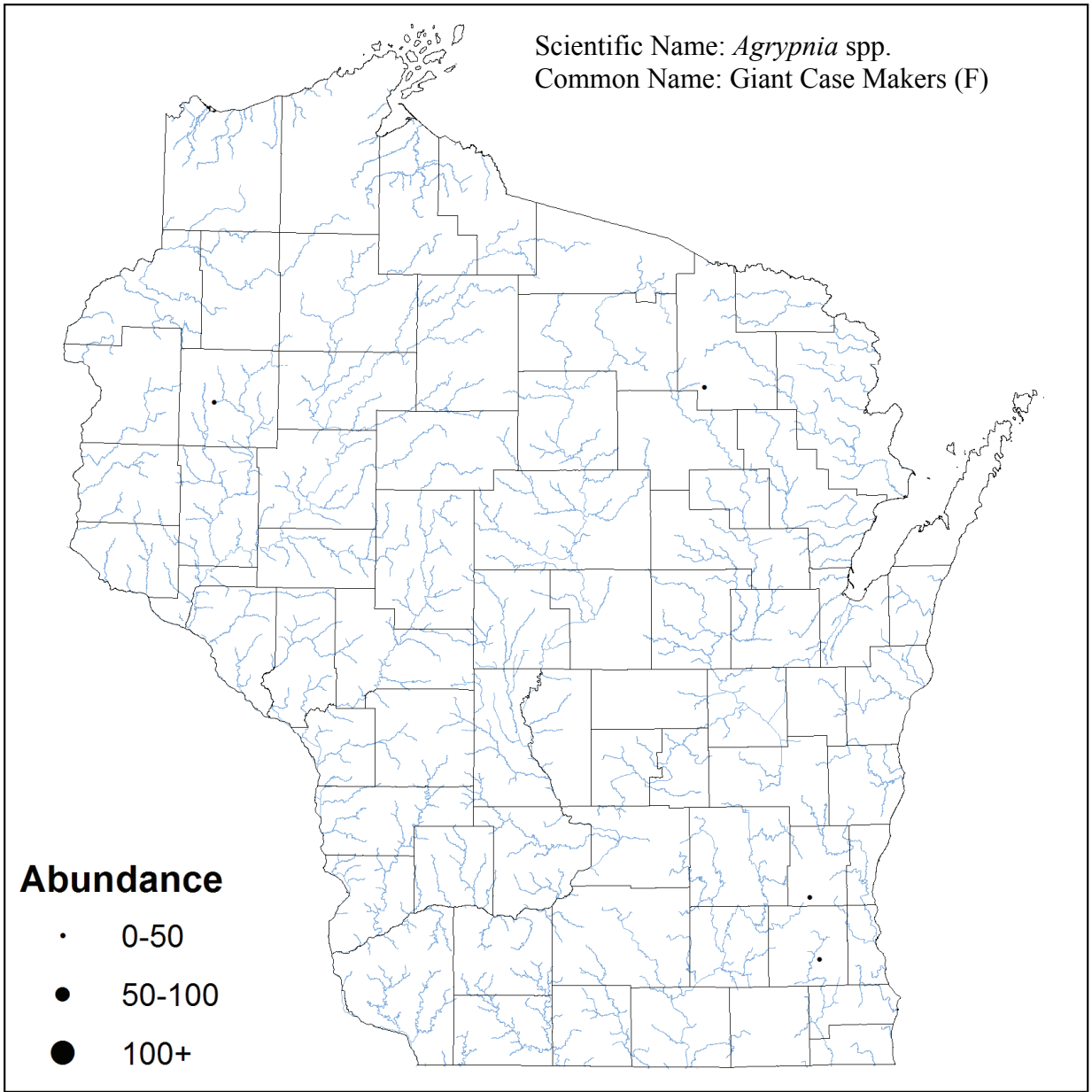


# Trichoptera Philopotamidae

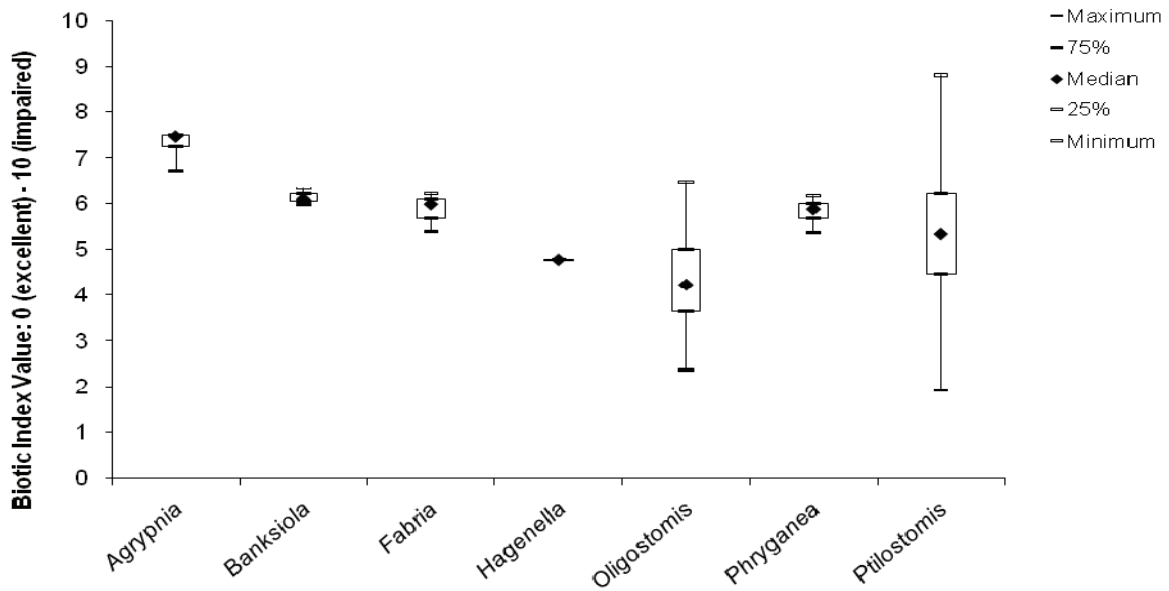
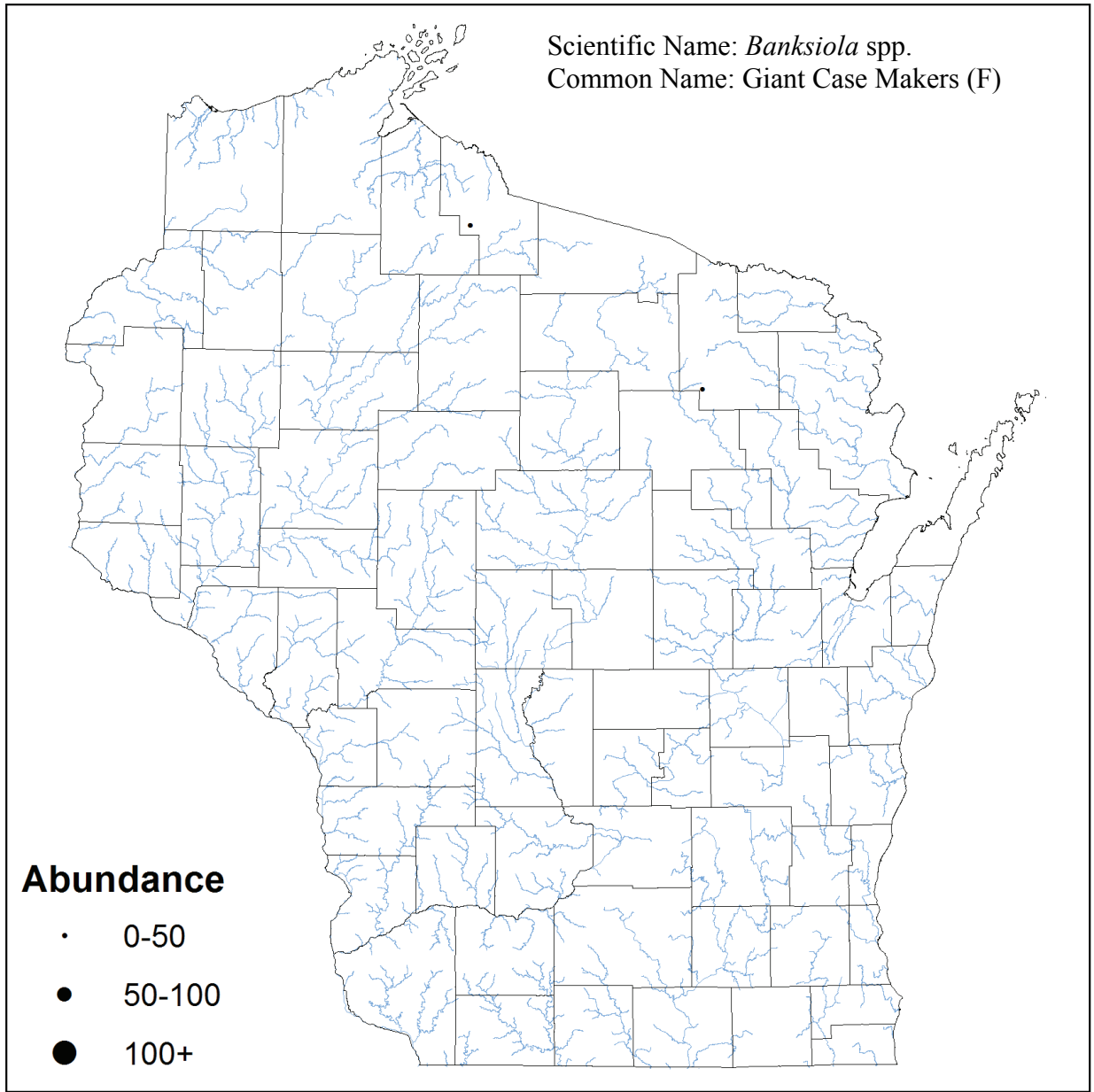




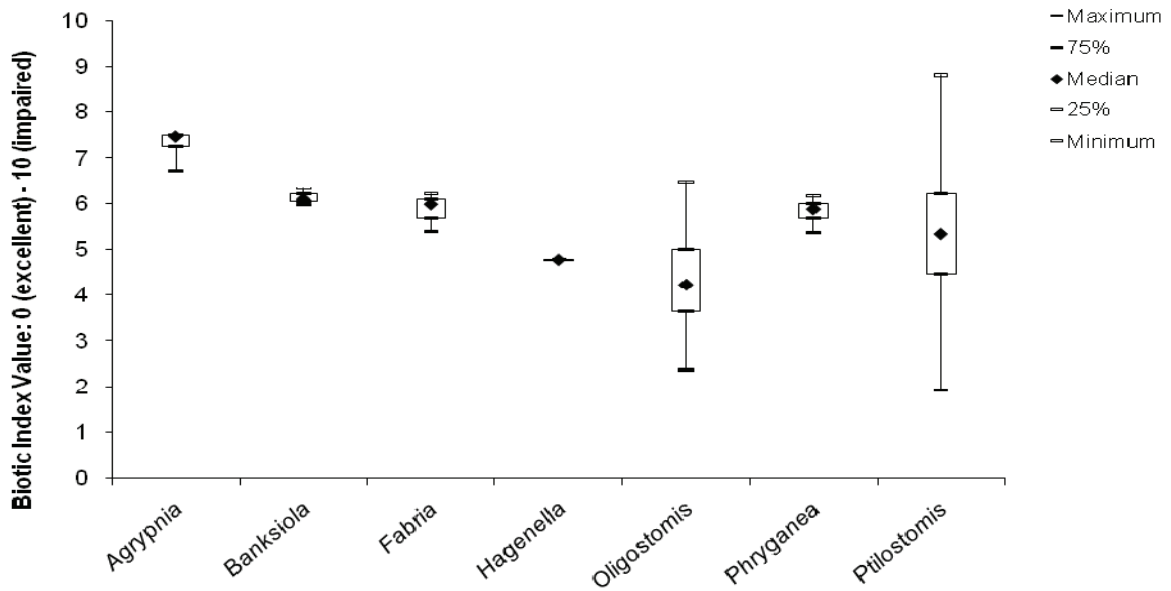
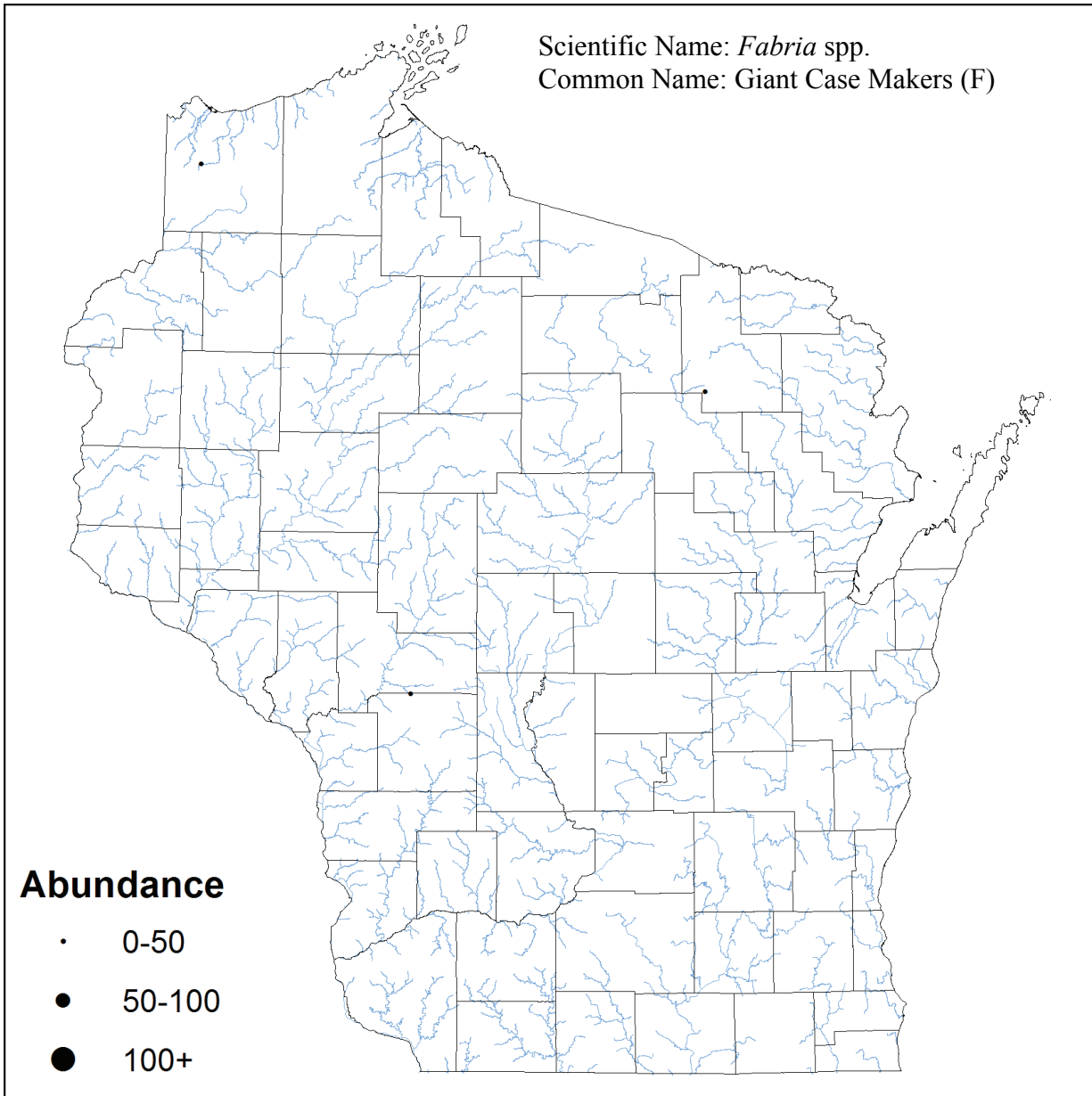
# Trichoptera Phryganeidae



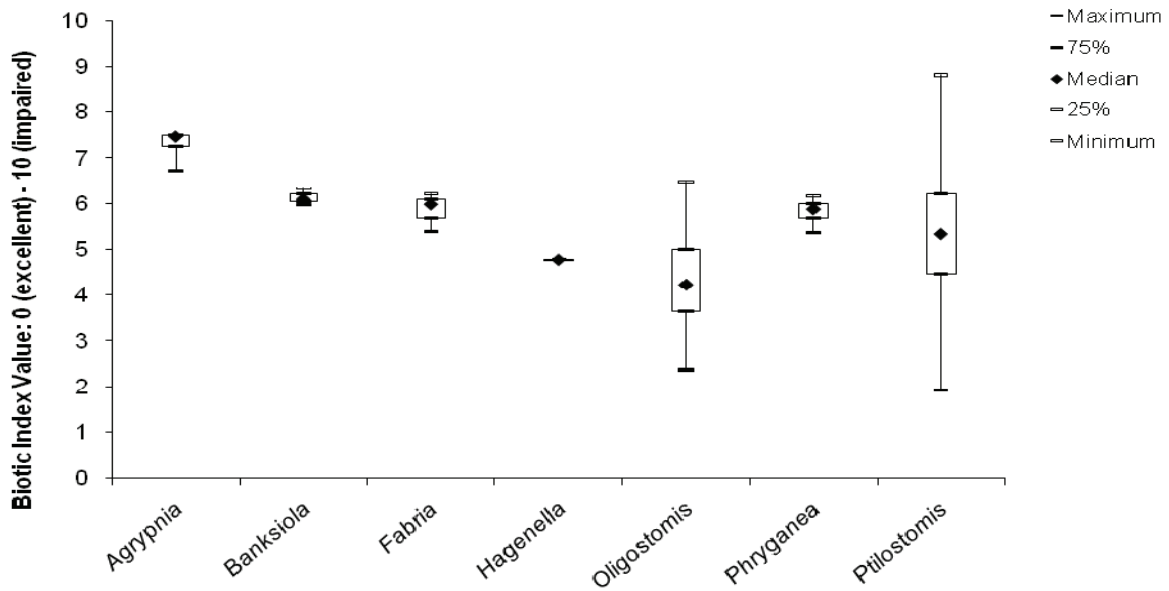
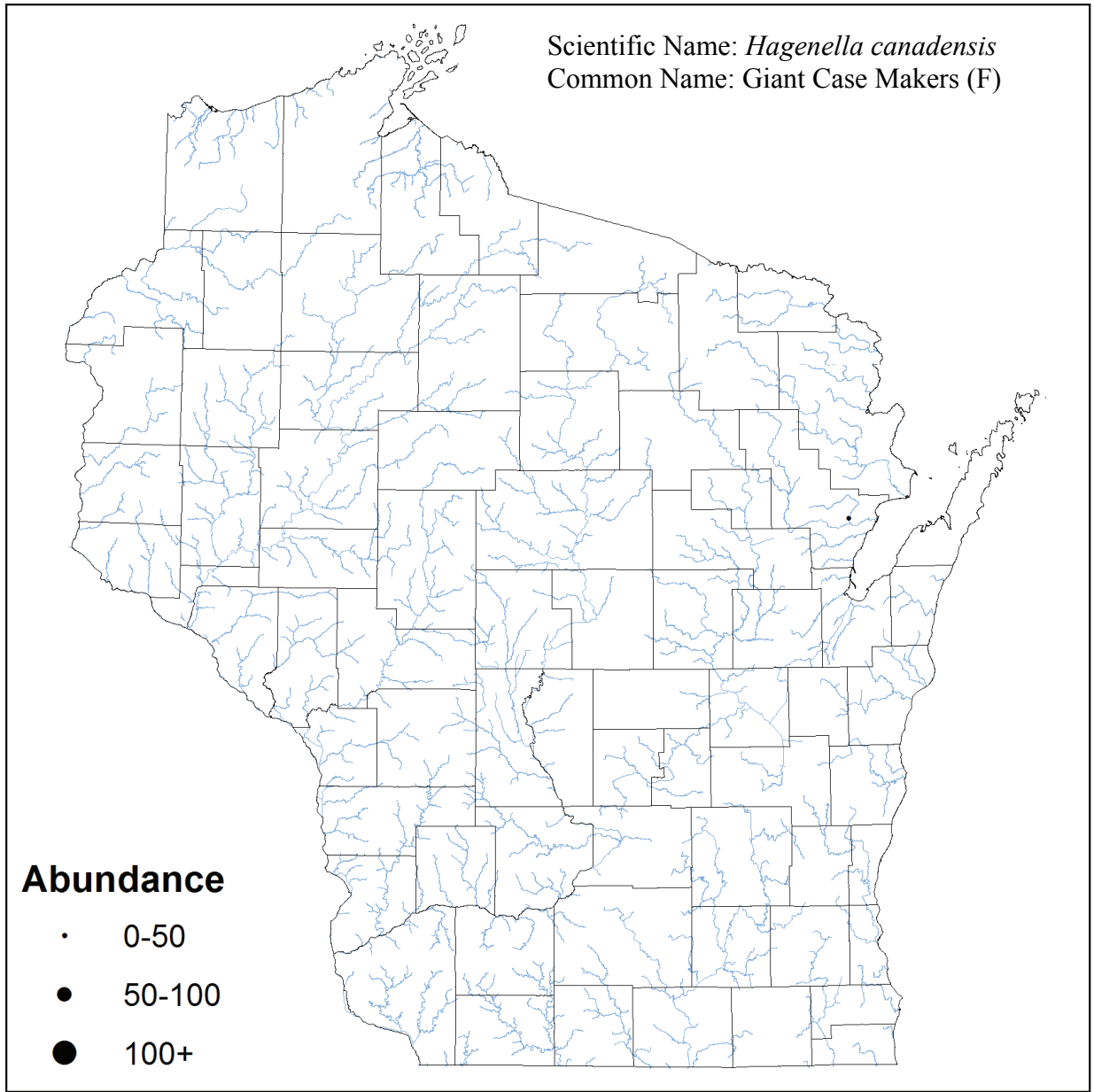
# Trichoptera Phryganeidae



# Trichoptera Phryganeidae

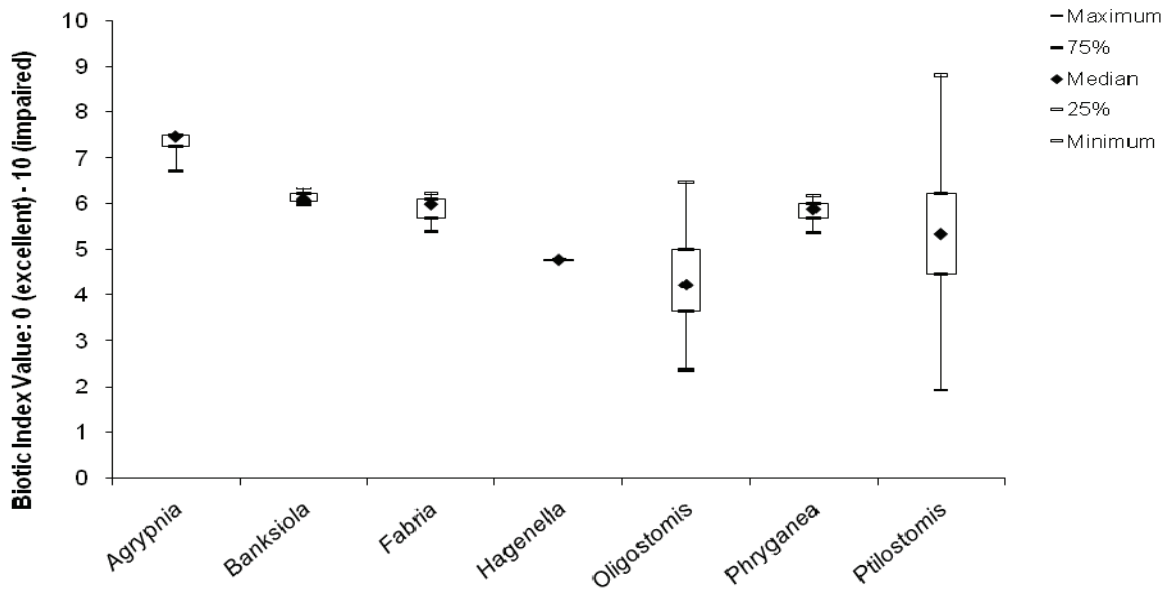
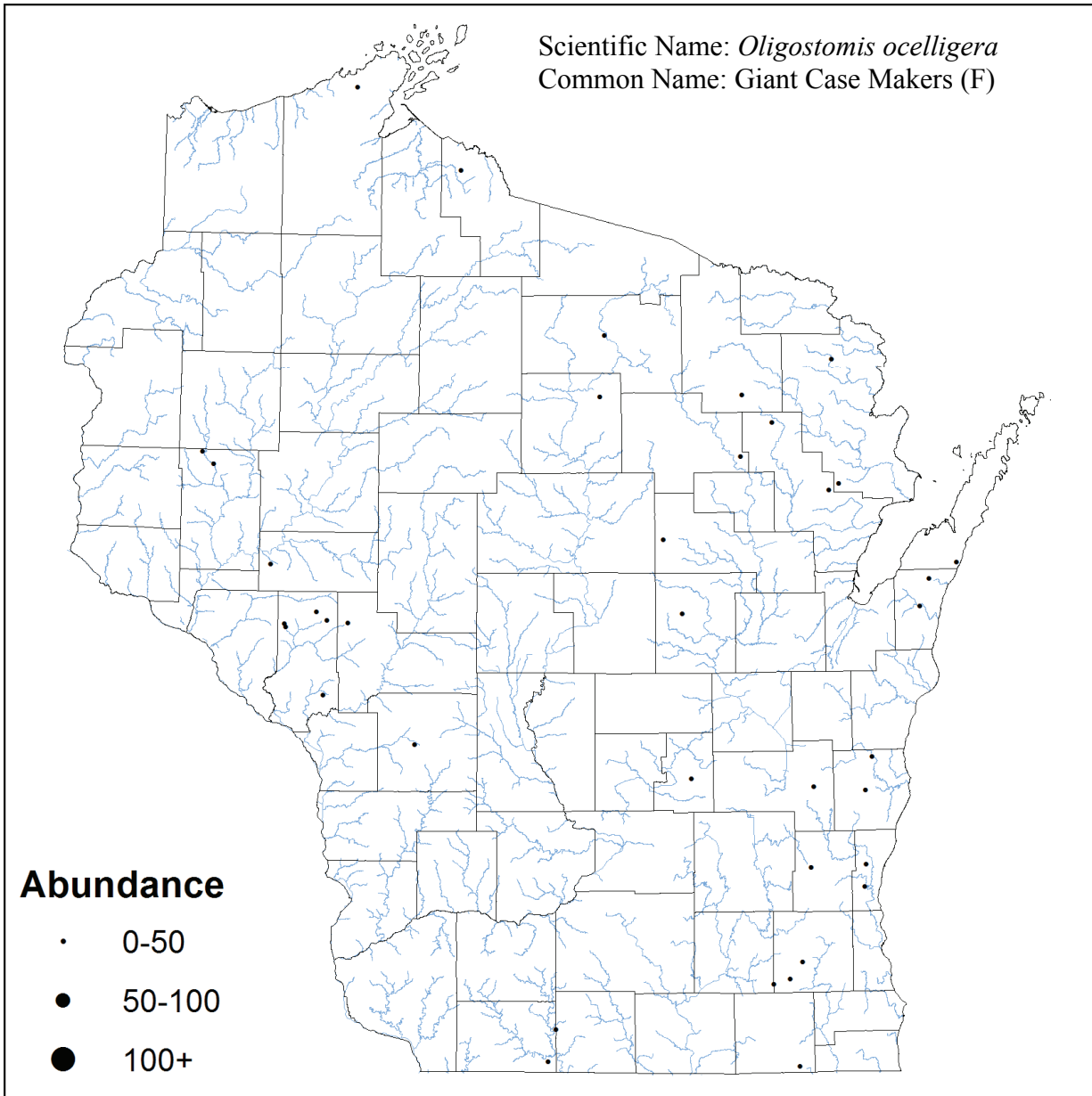


# Trichoptera Phryganeidae

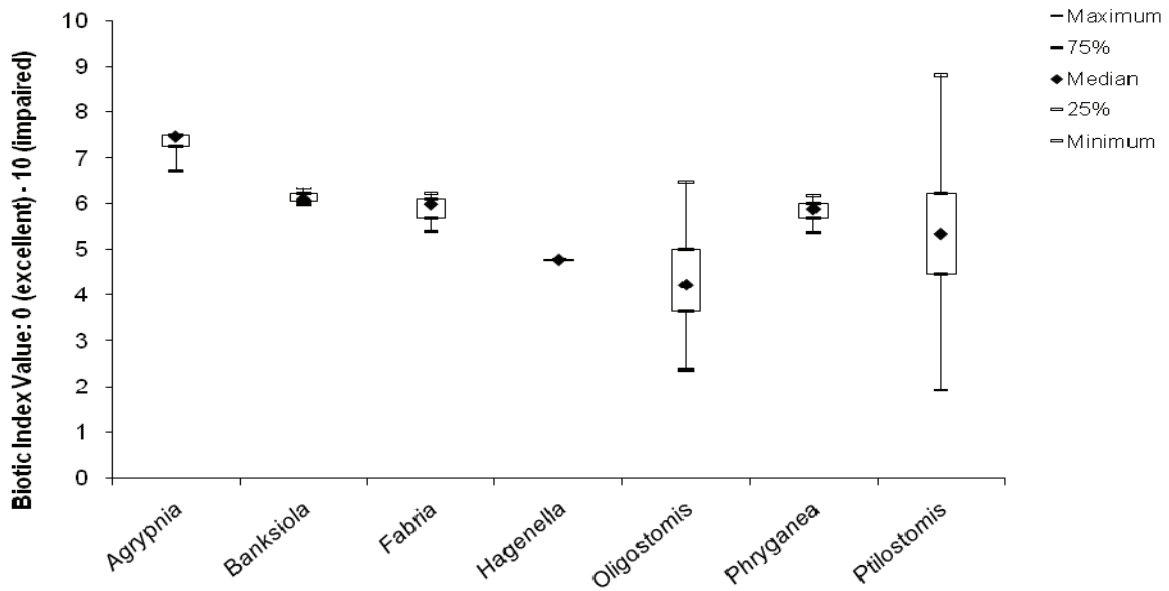
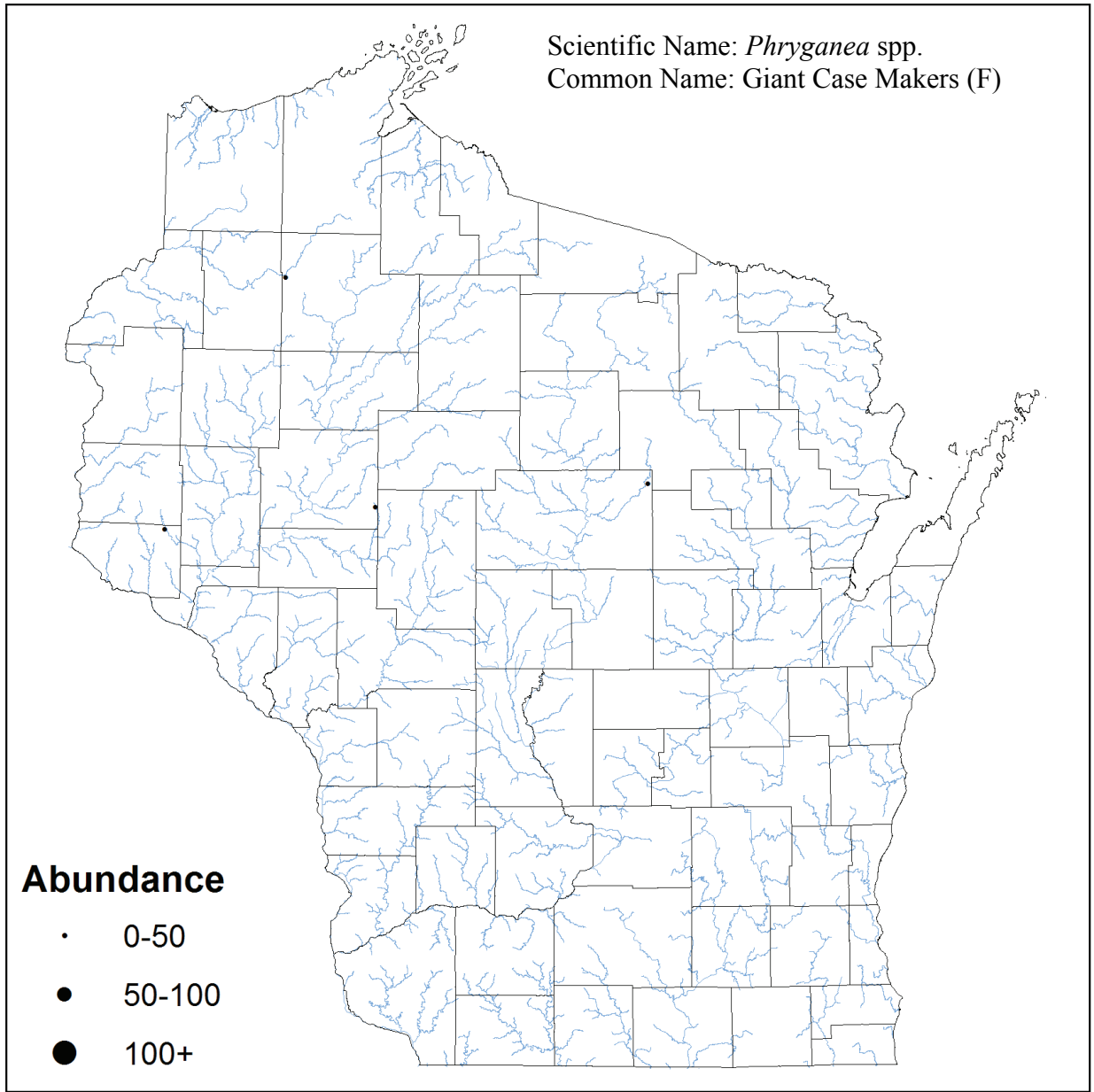


# Trichoptera Phryganeidae

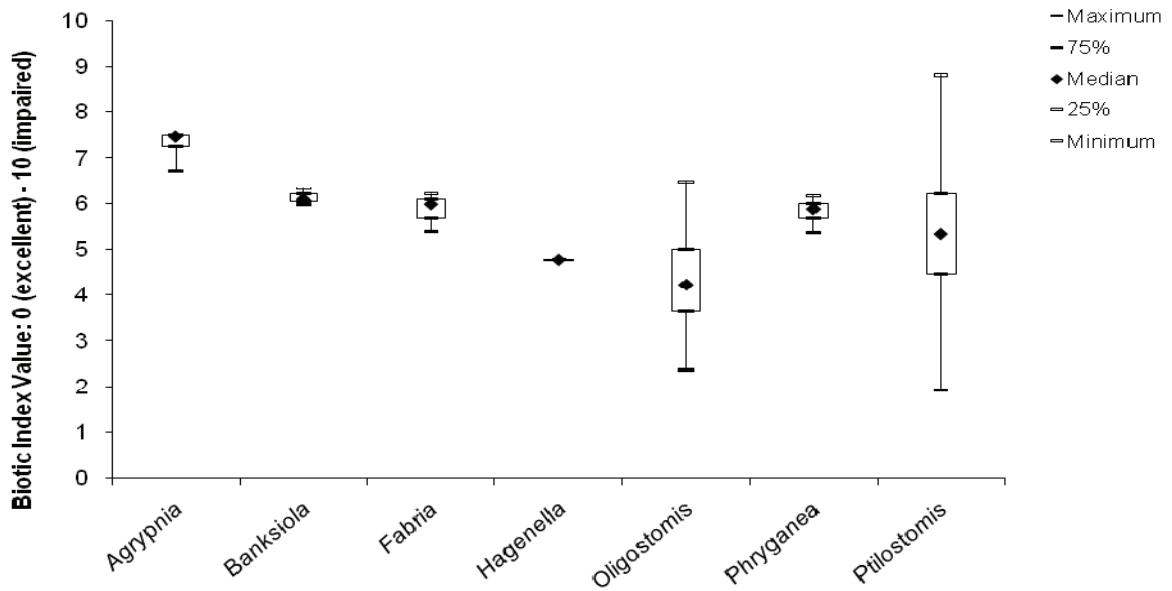
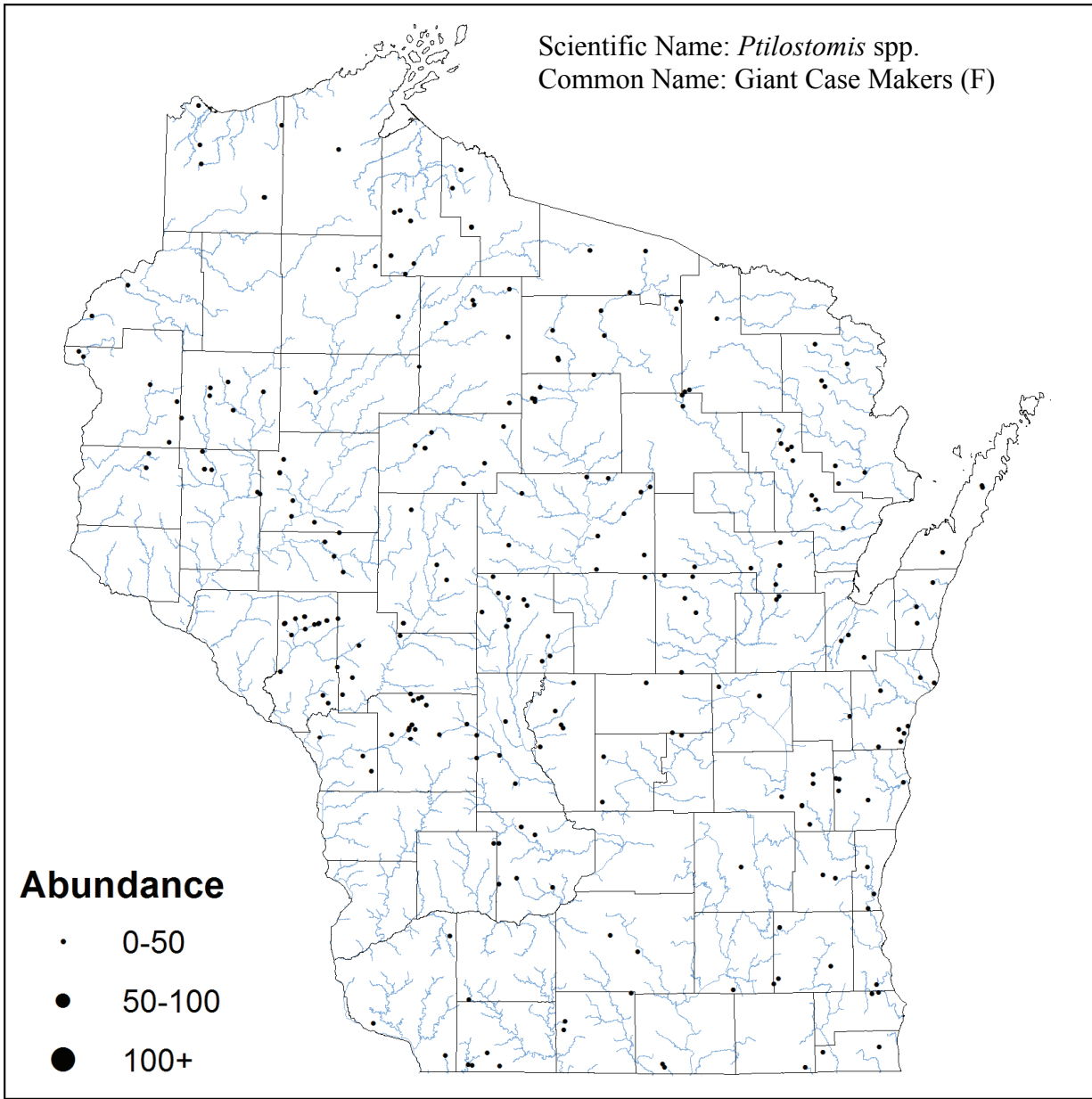
Scientific Name: *Oligostomis ocelligera*  
 Common Name: Giant Case Makers (F)



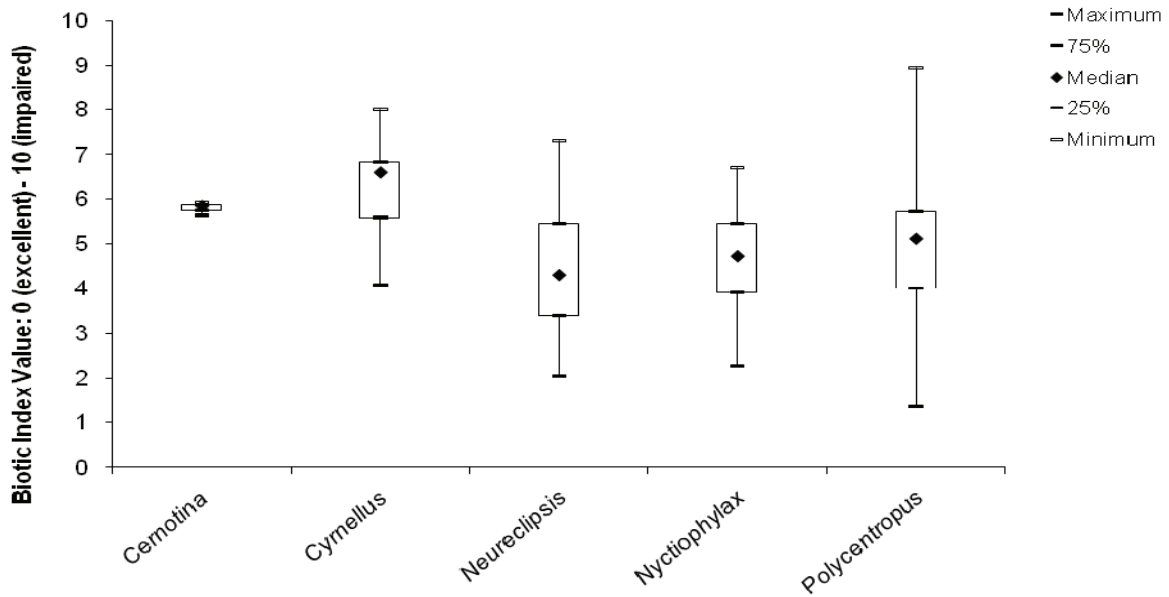
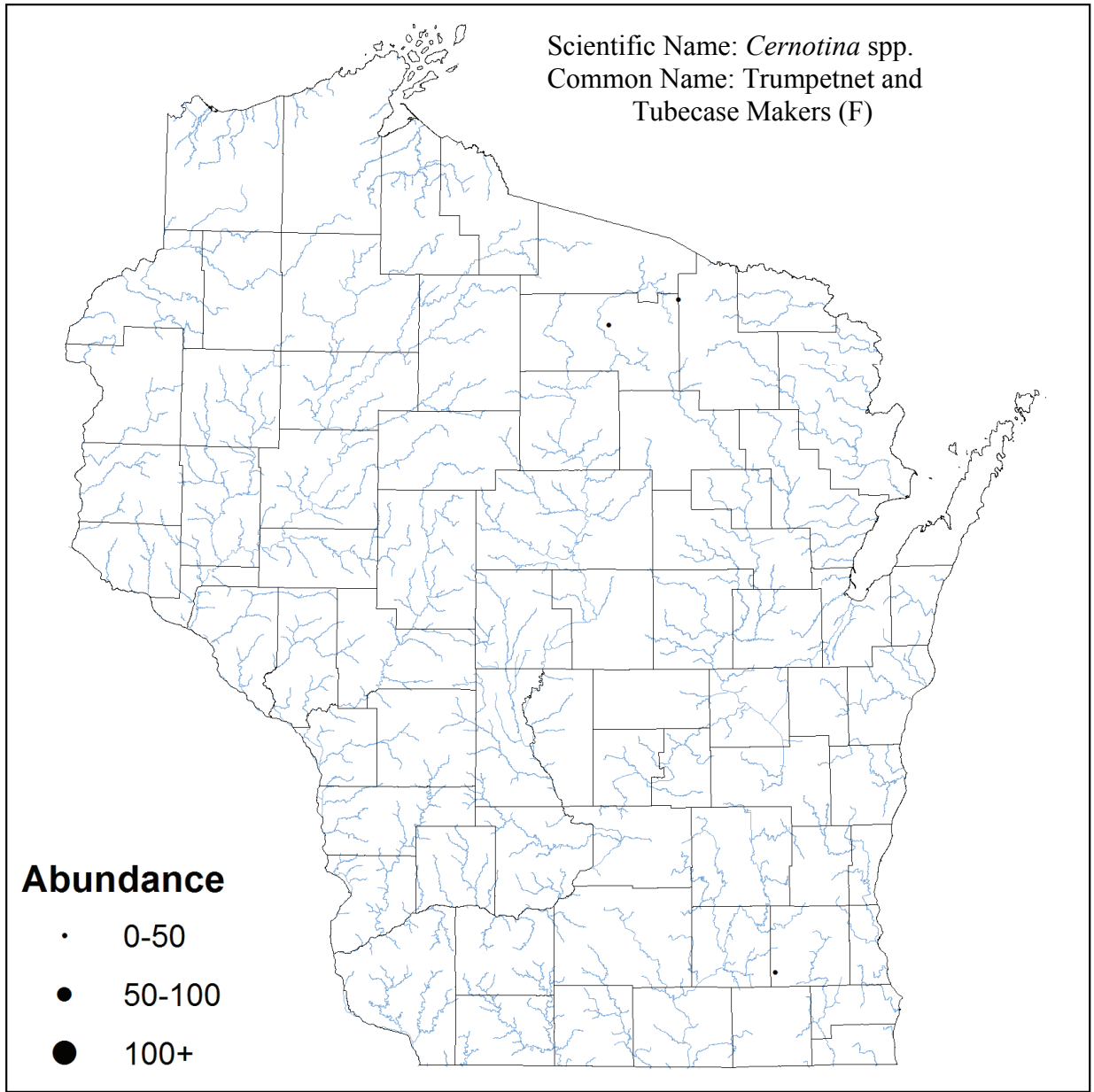
# Trichoptera Phryganeidae



# Trichoptera Phryganeidae

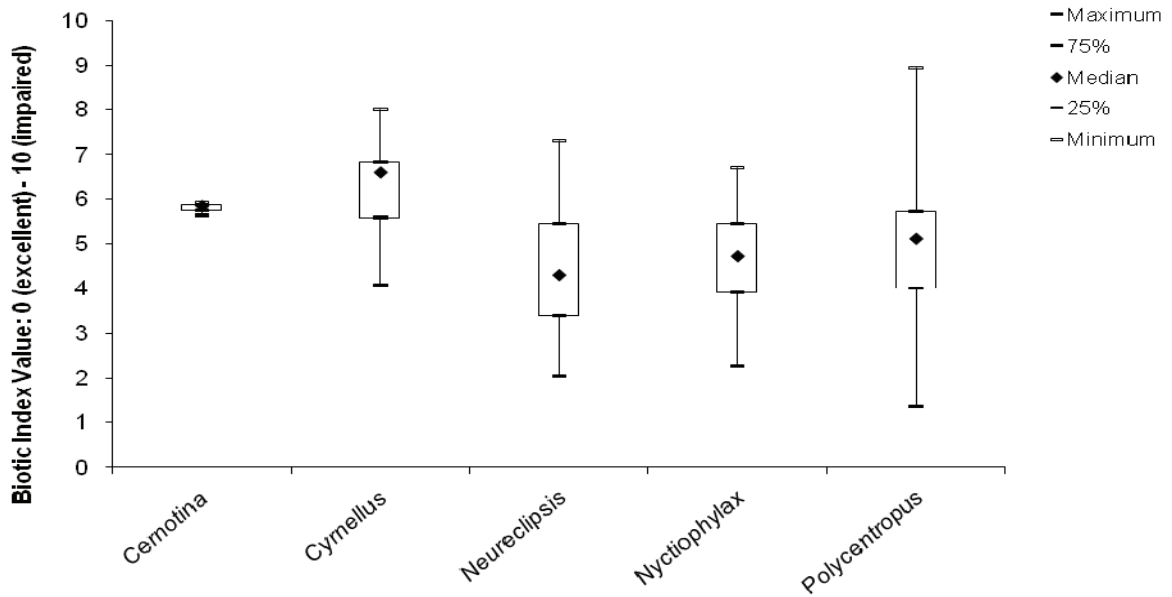
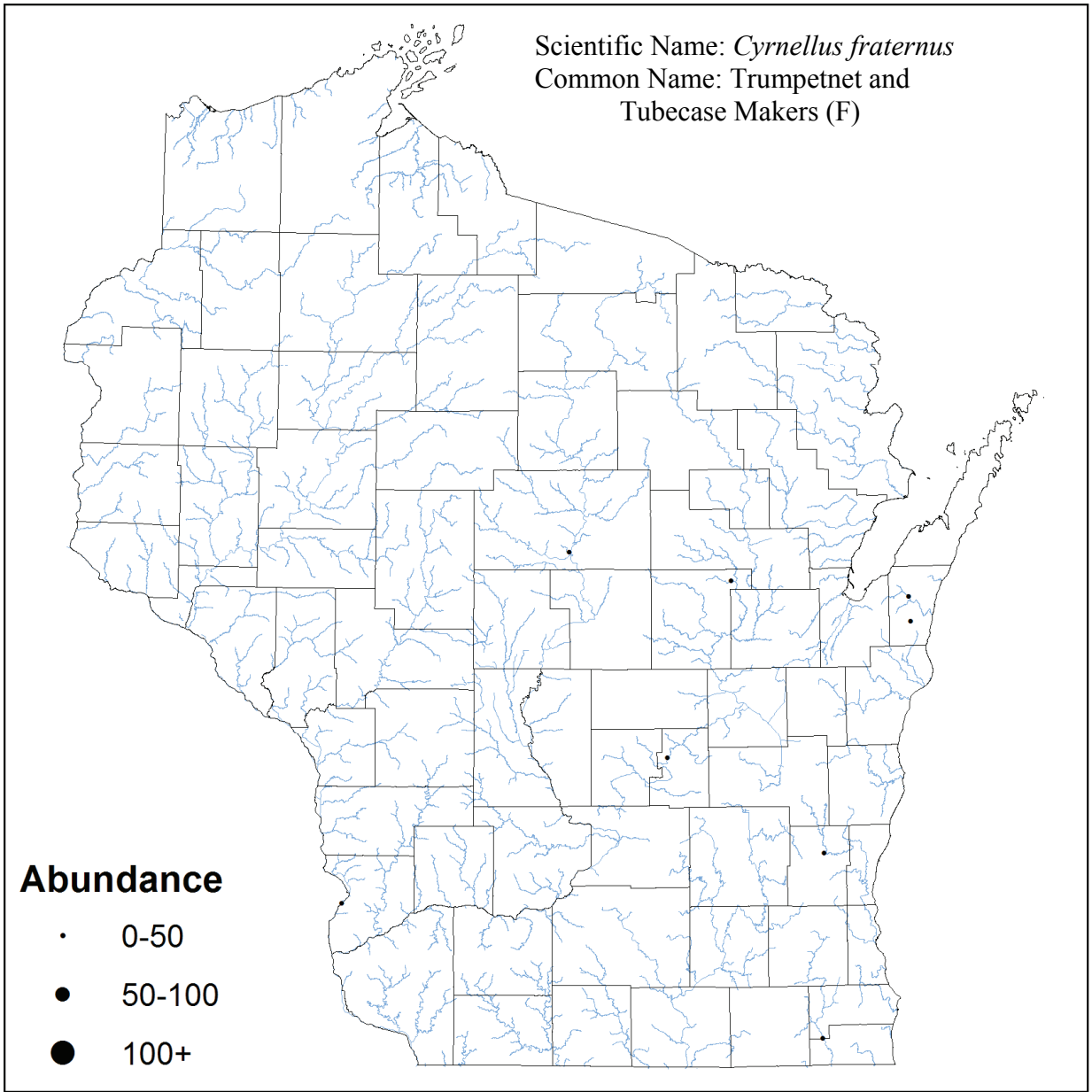


# Trichoptera Polycentropodidae

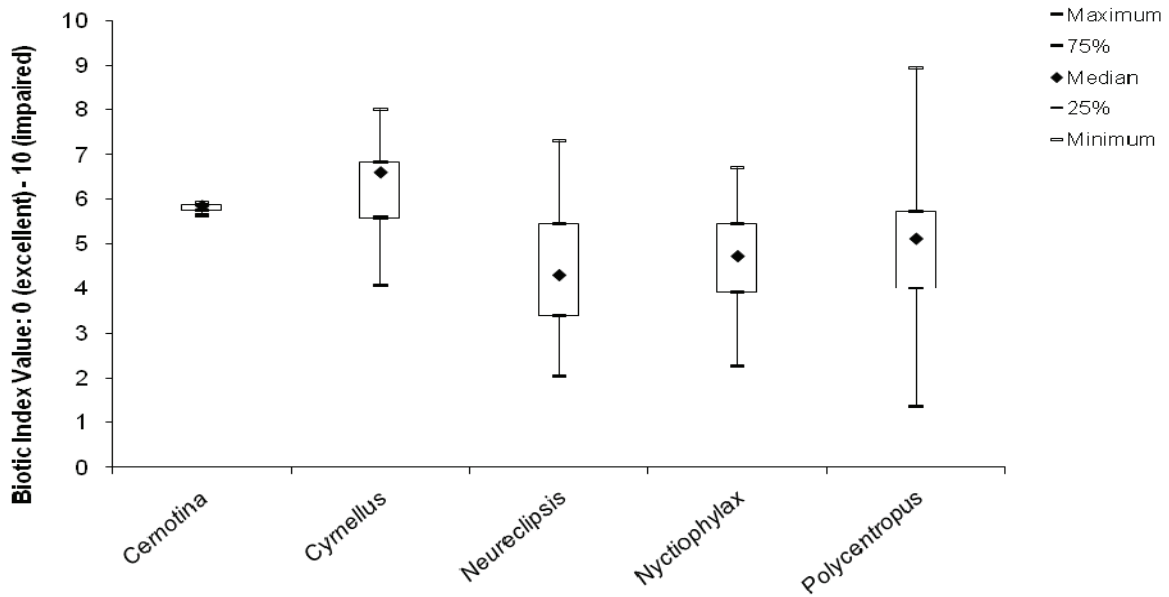
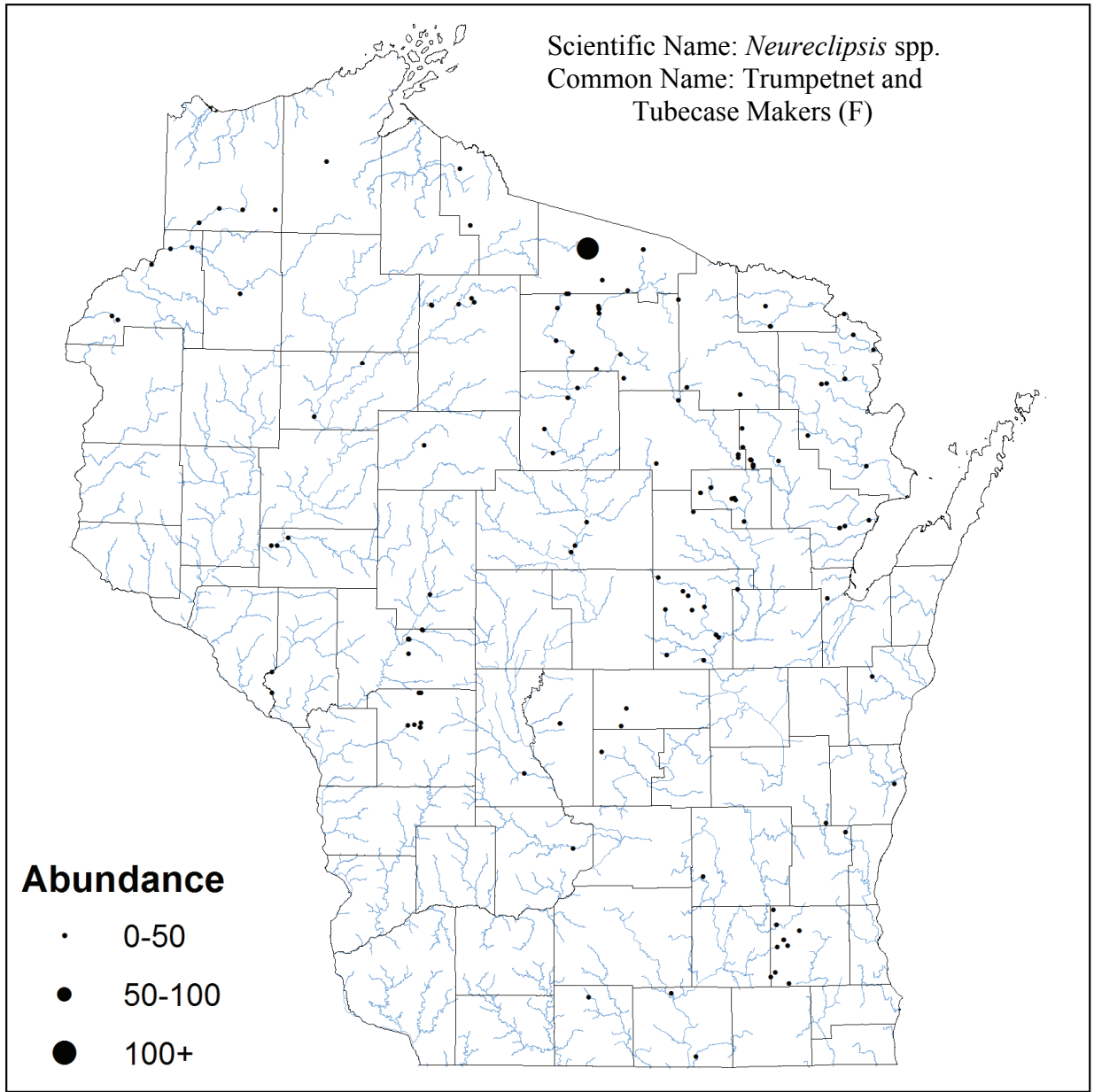




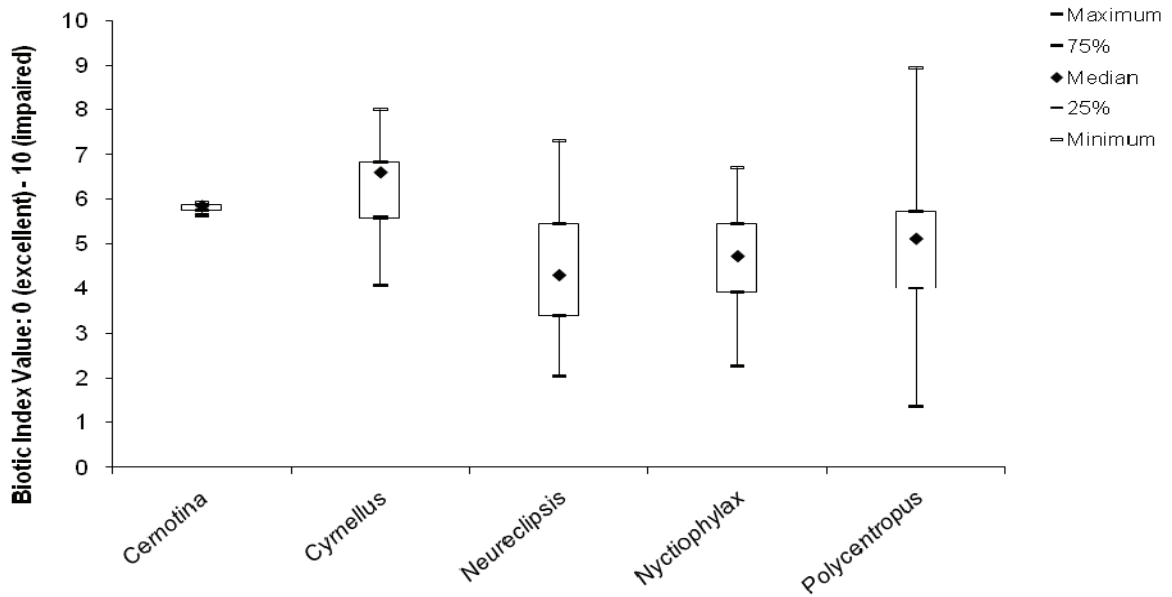
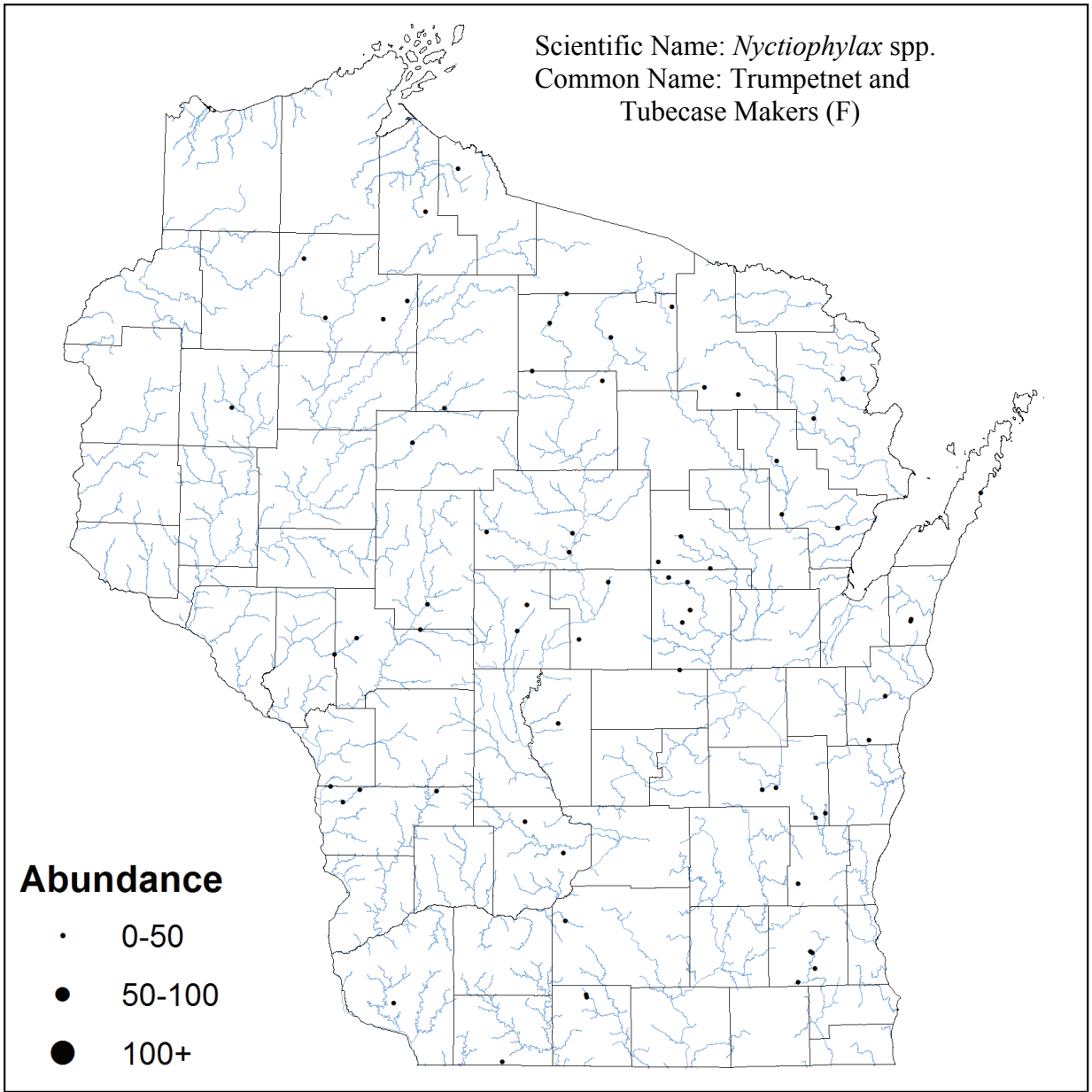
# Trichoptera Polycentropodidae



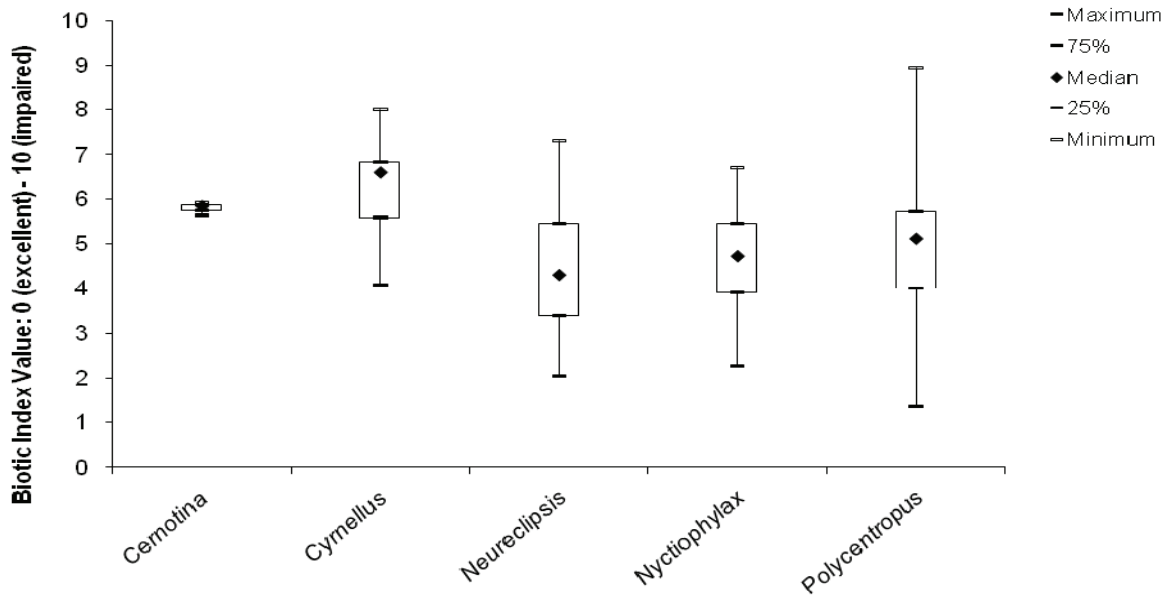
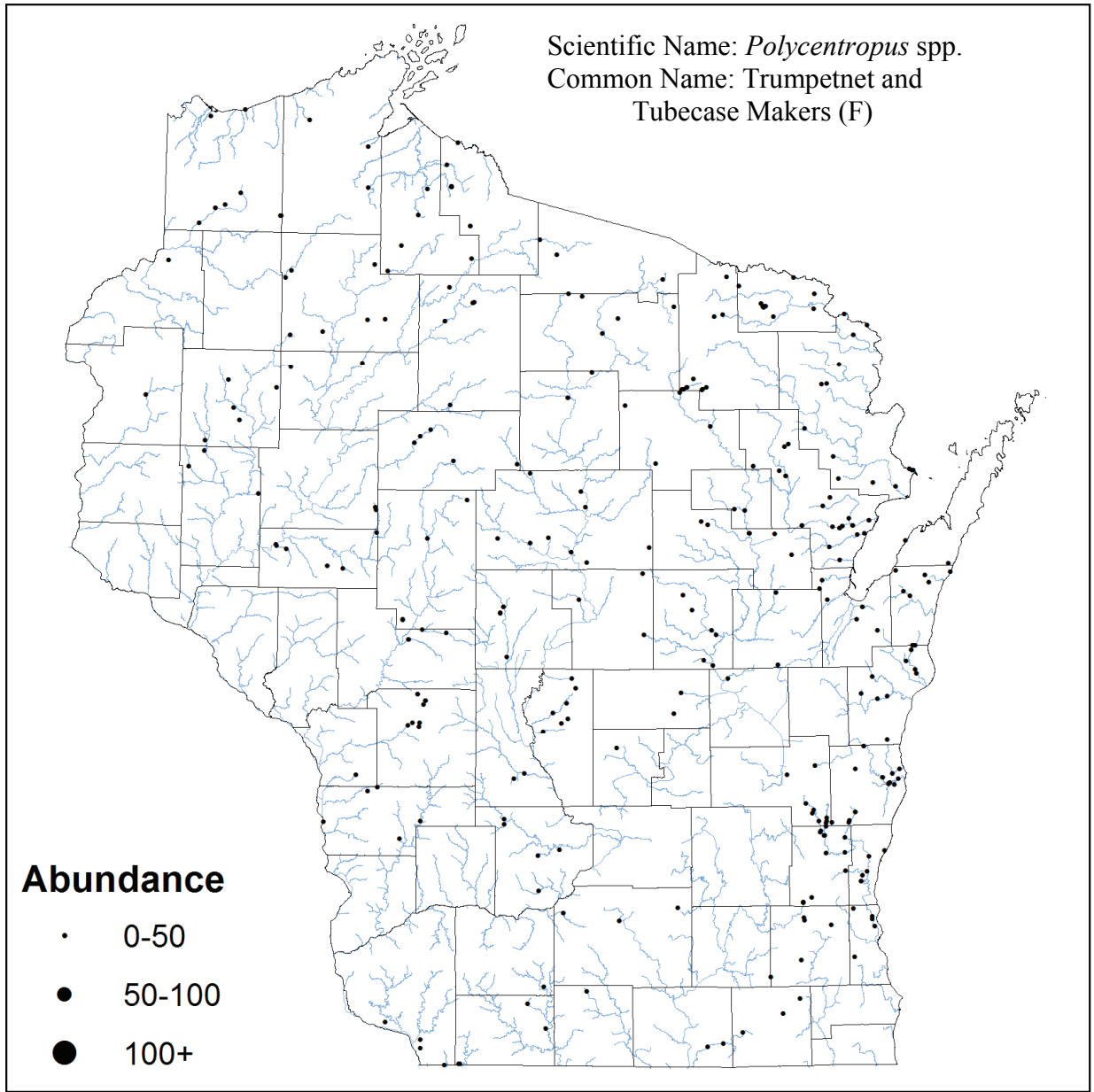
# Trichoptera Polycentropodidae



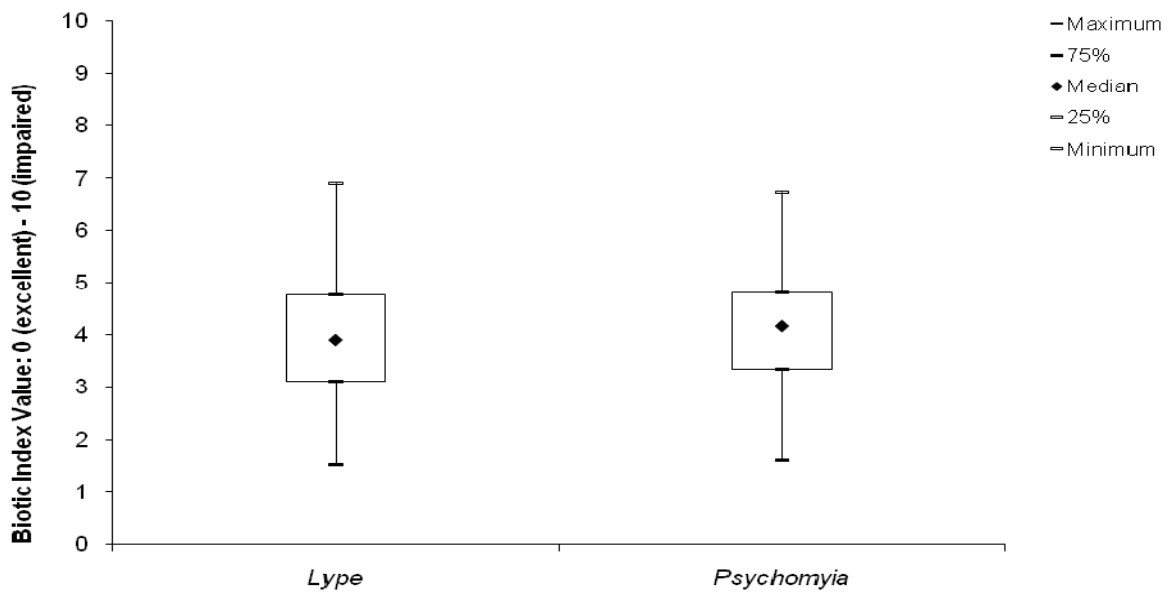
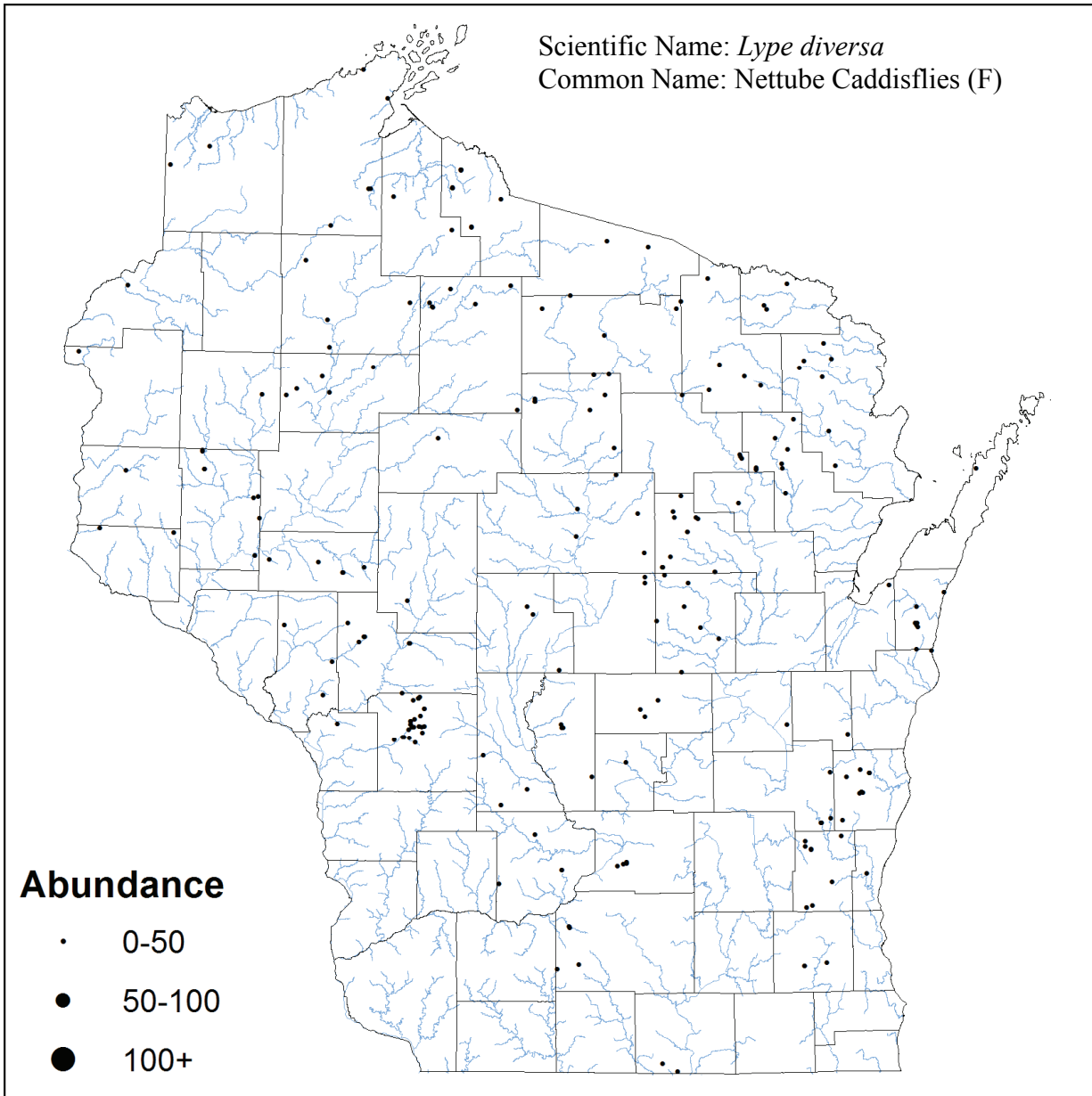
# Trichoptera Polycentropodidae



# Trichoptera Polycentropodidae



# Trichoptera Psychomyiidae

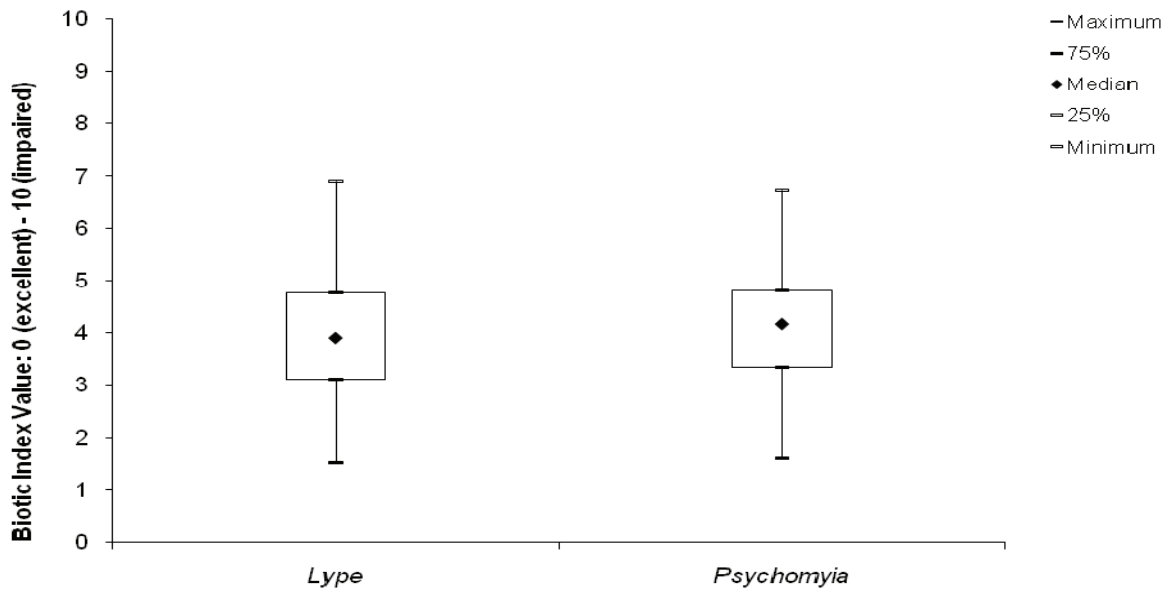
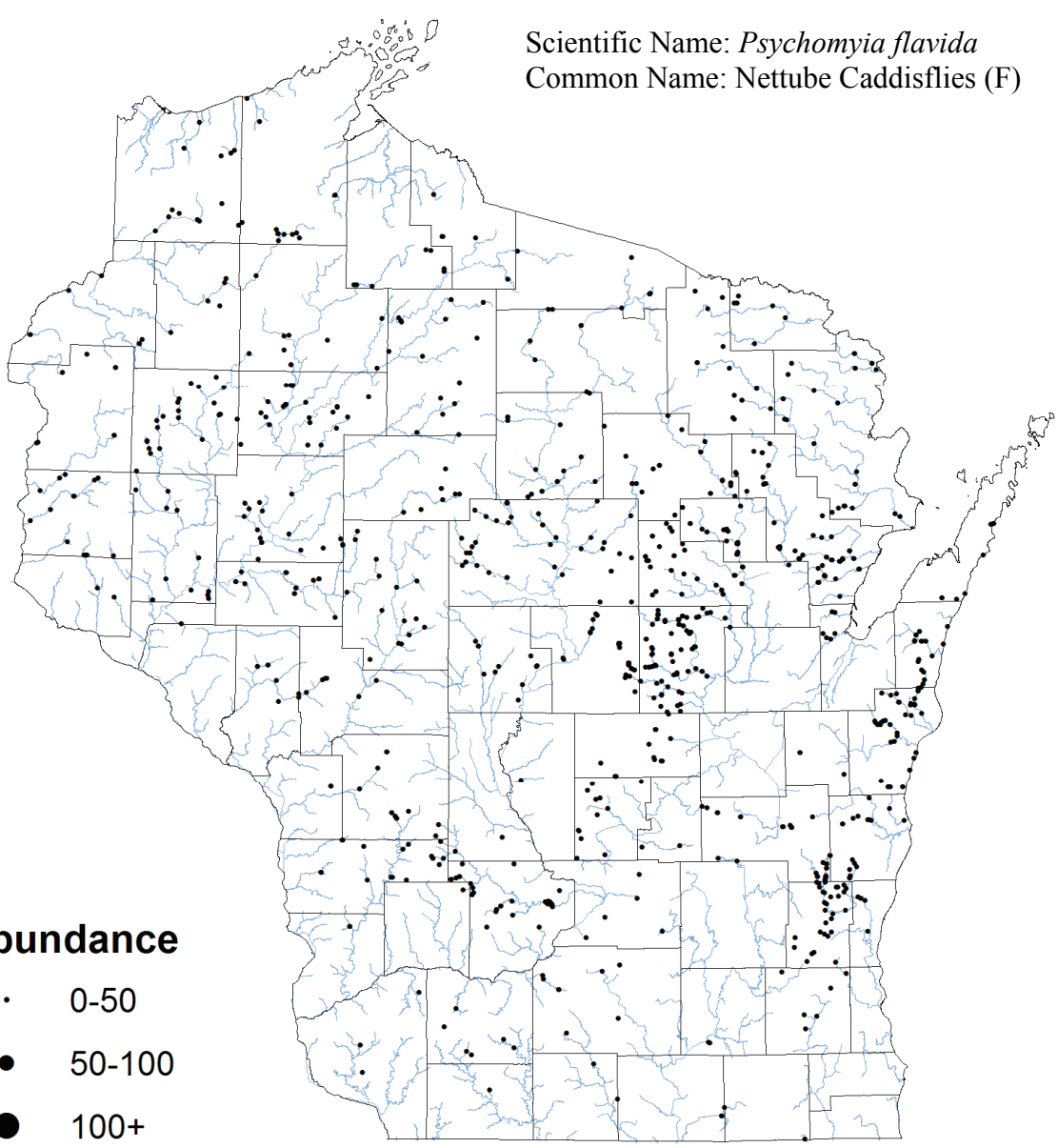


# Trichoptera Psychomyiidae

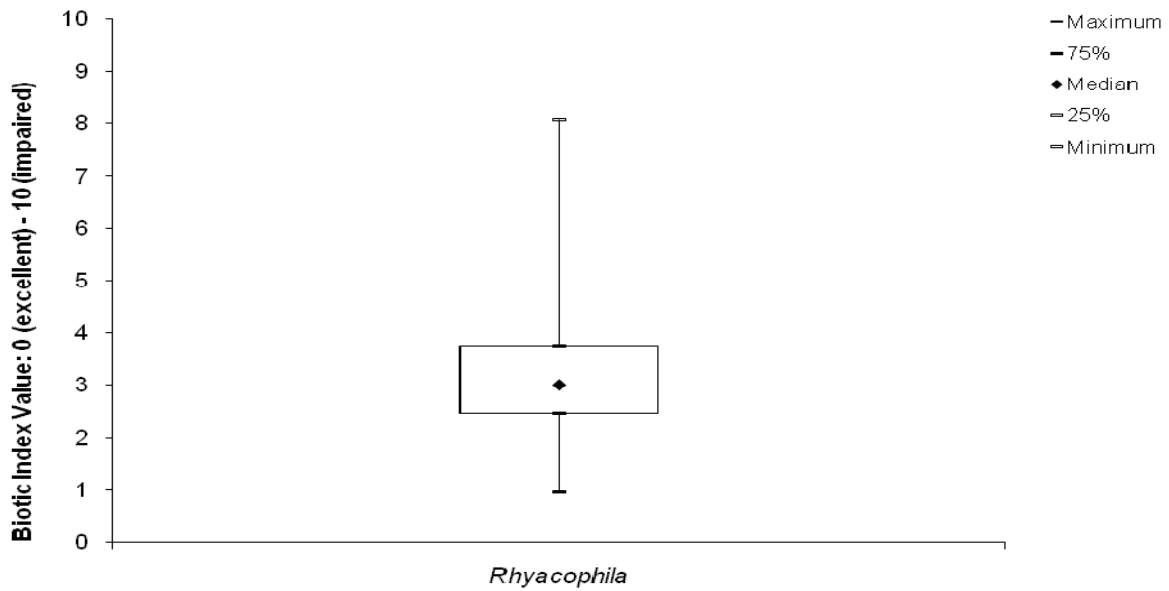
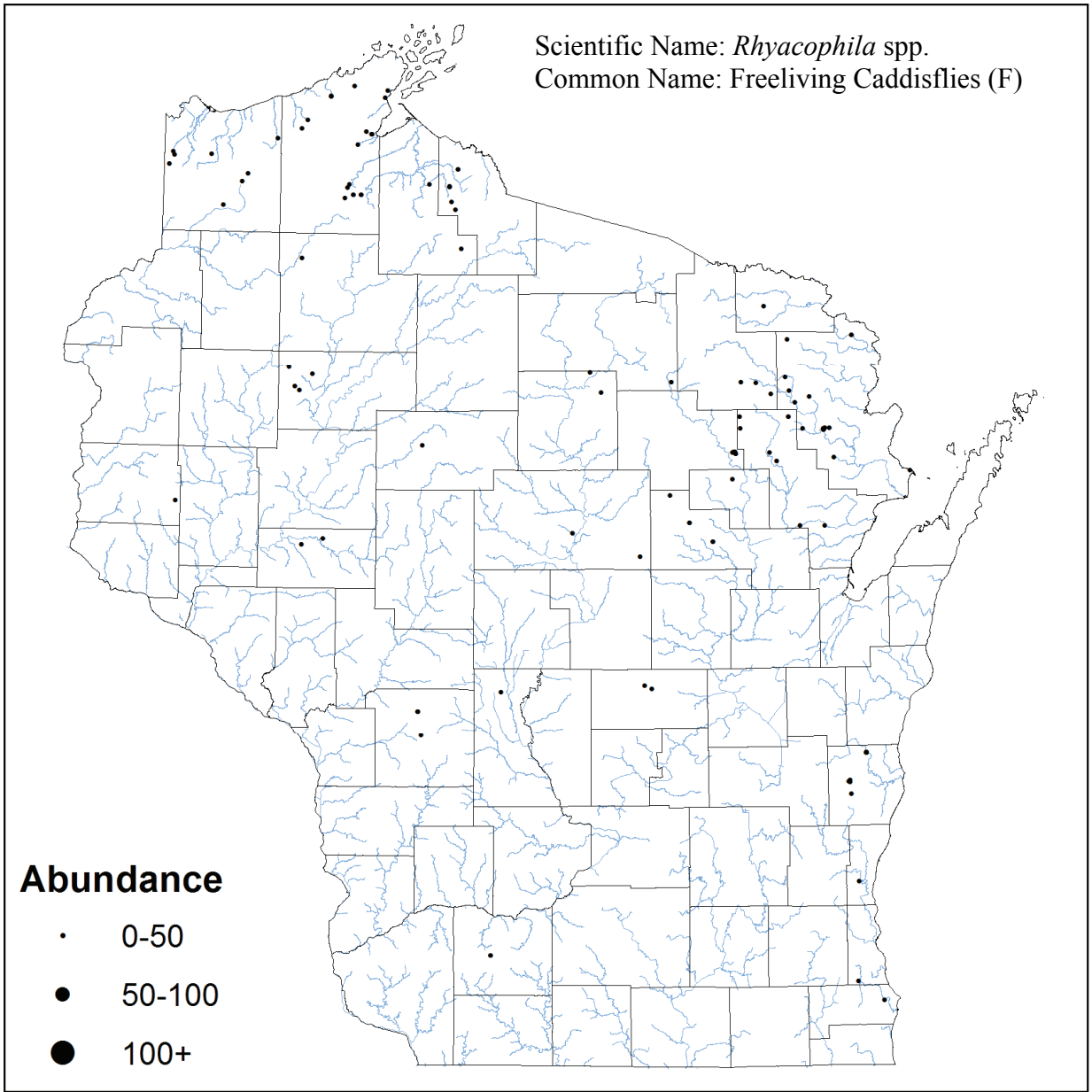
Scientific Name: *Psychomyia flavida*  
Common Name: Nettube Caddisflies (F)

## Abundance

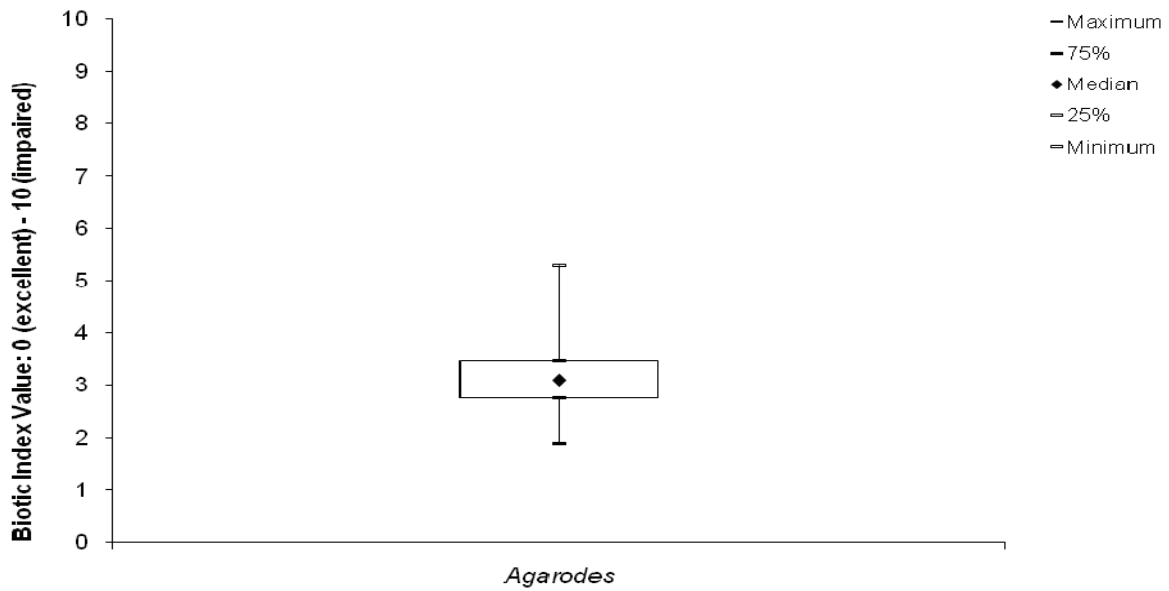
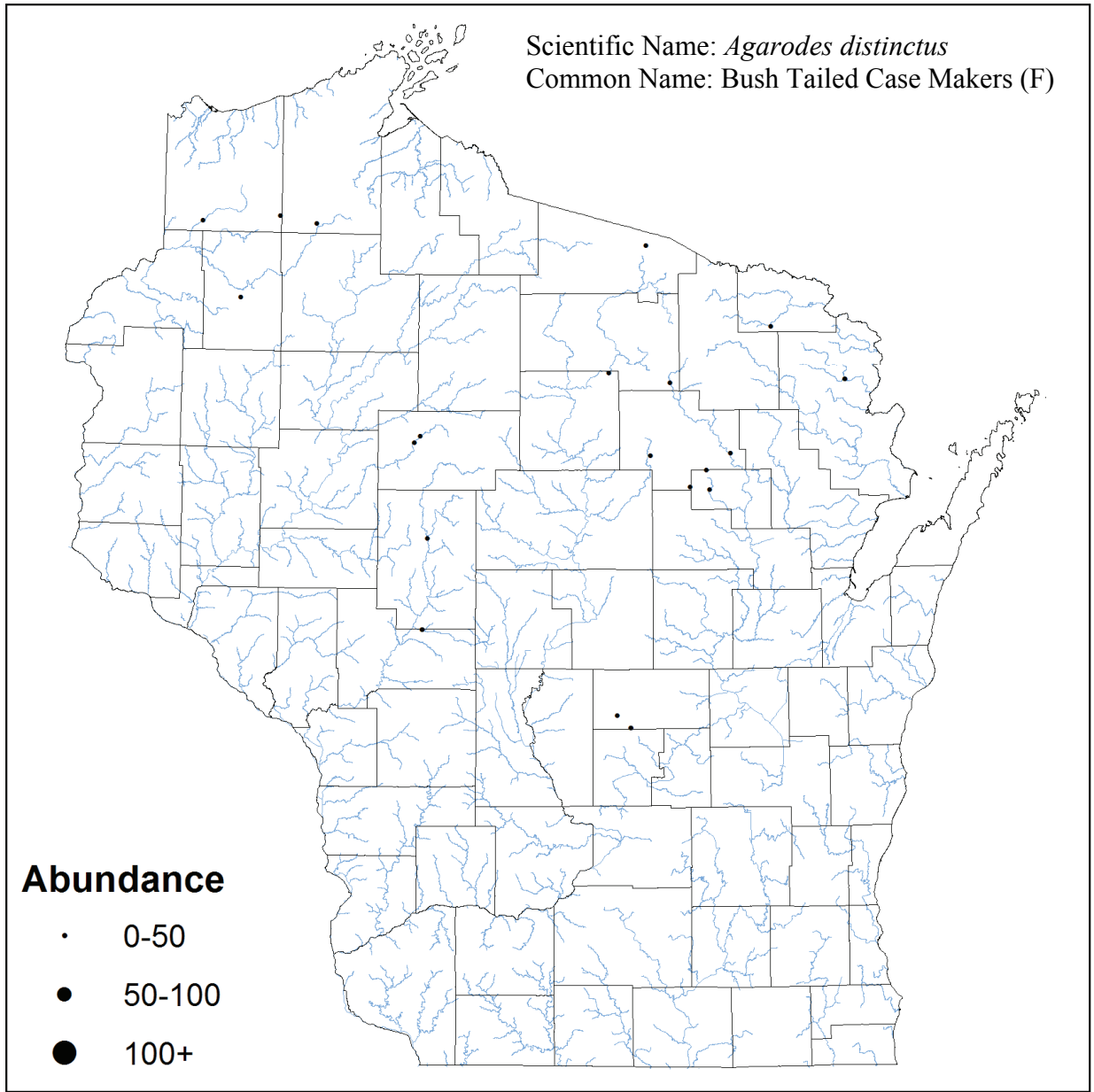
- 0-50
- 50-100
- 100+



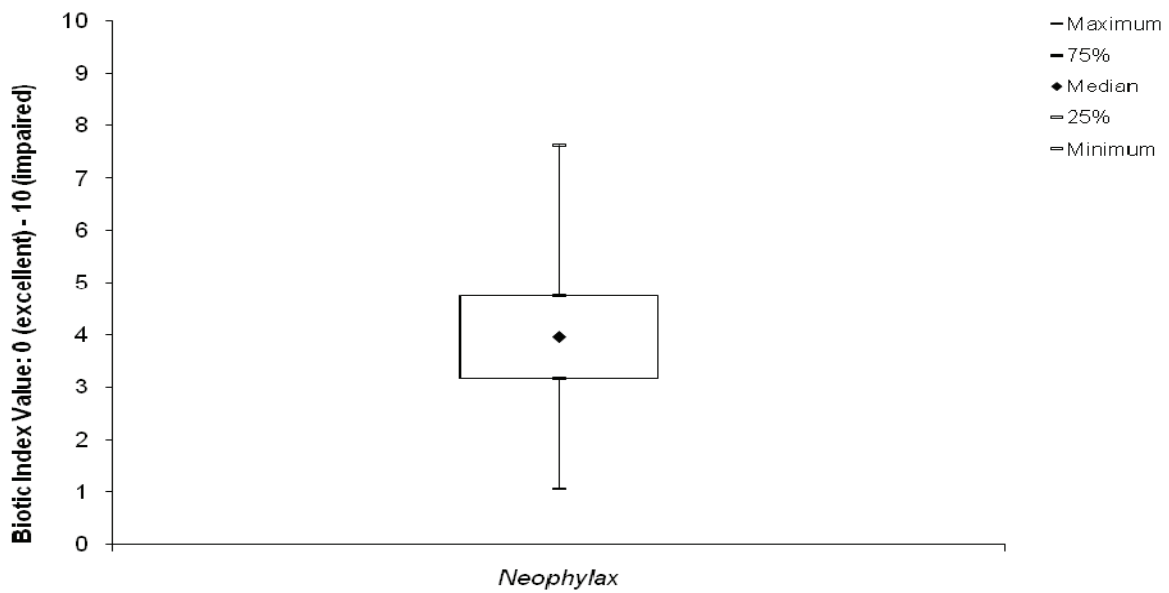
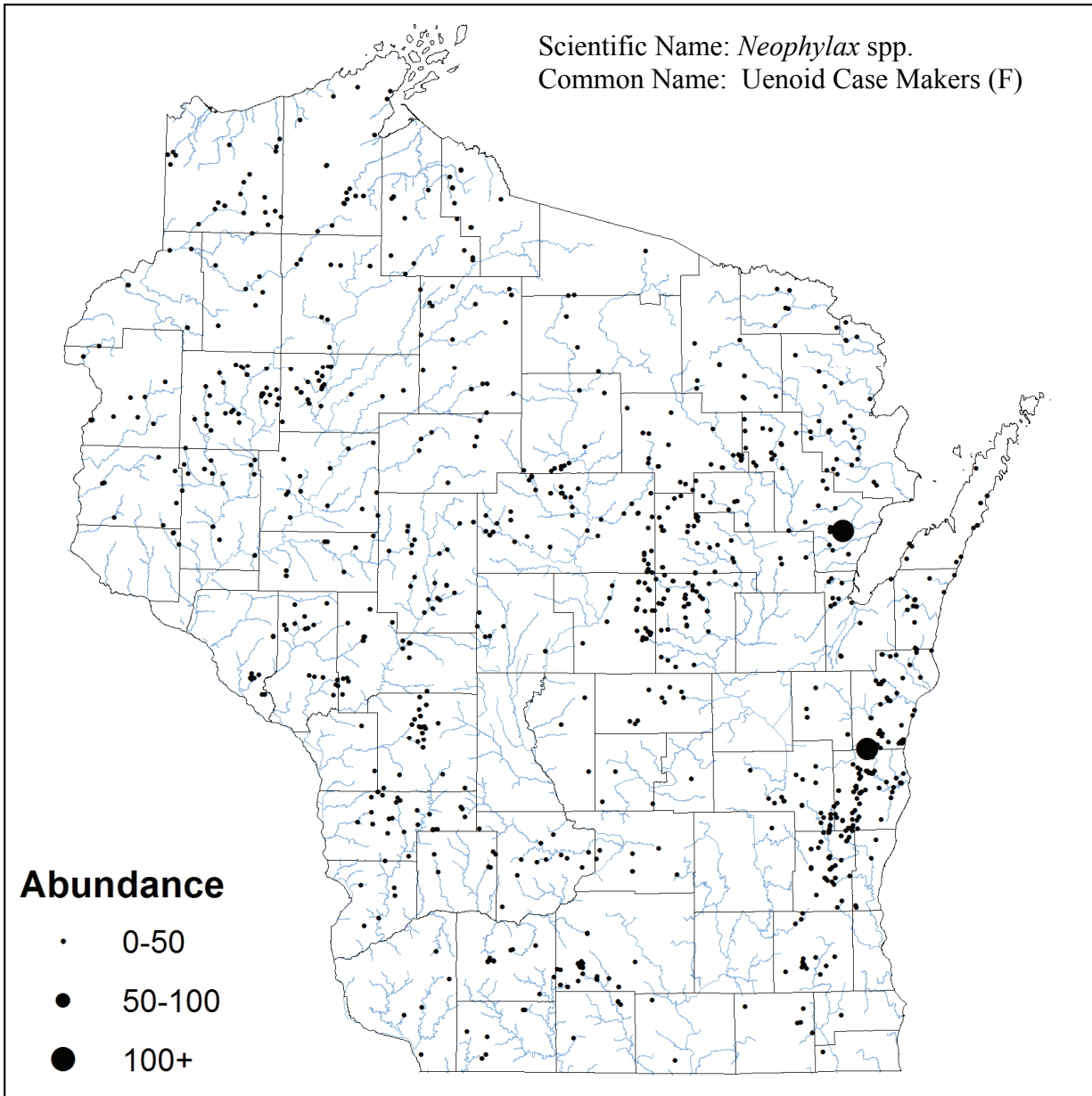
# Trichoptera Rhyacophilidae



# Trichoptera Sericostomatidae



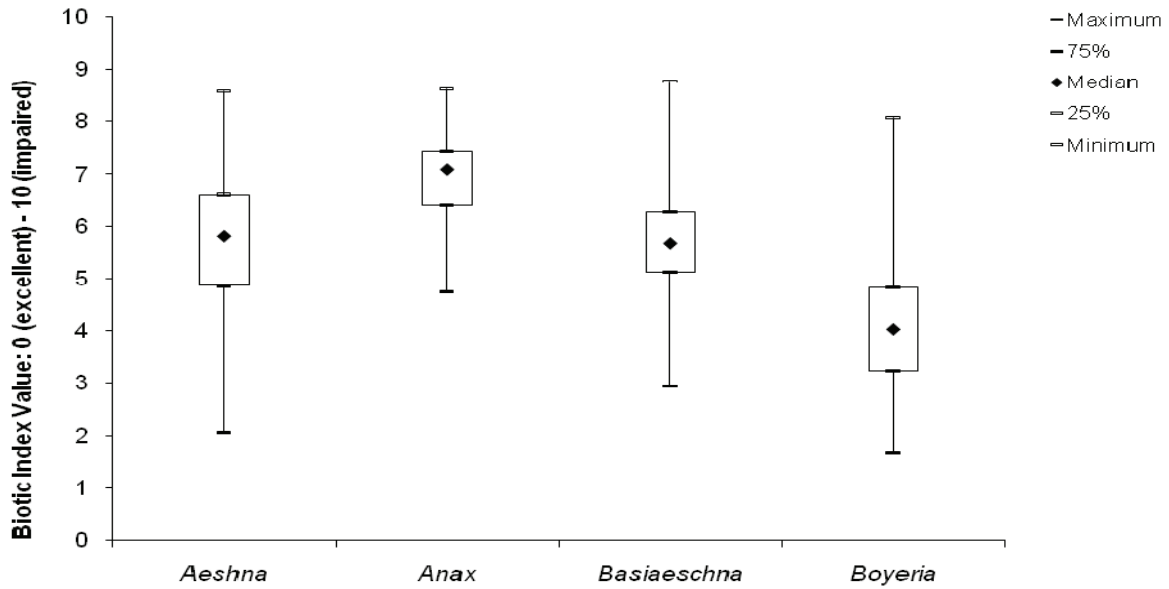
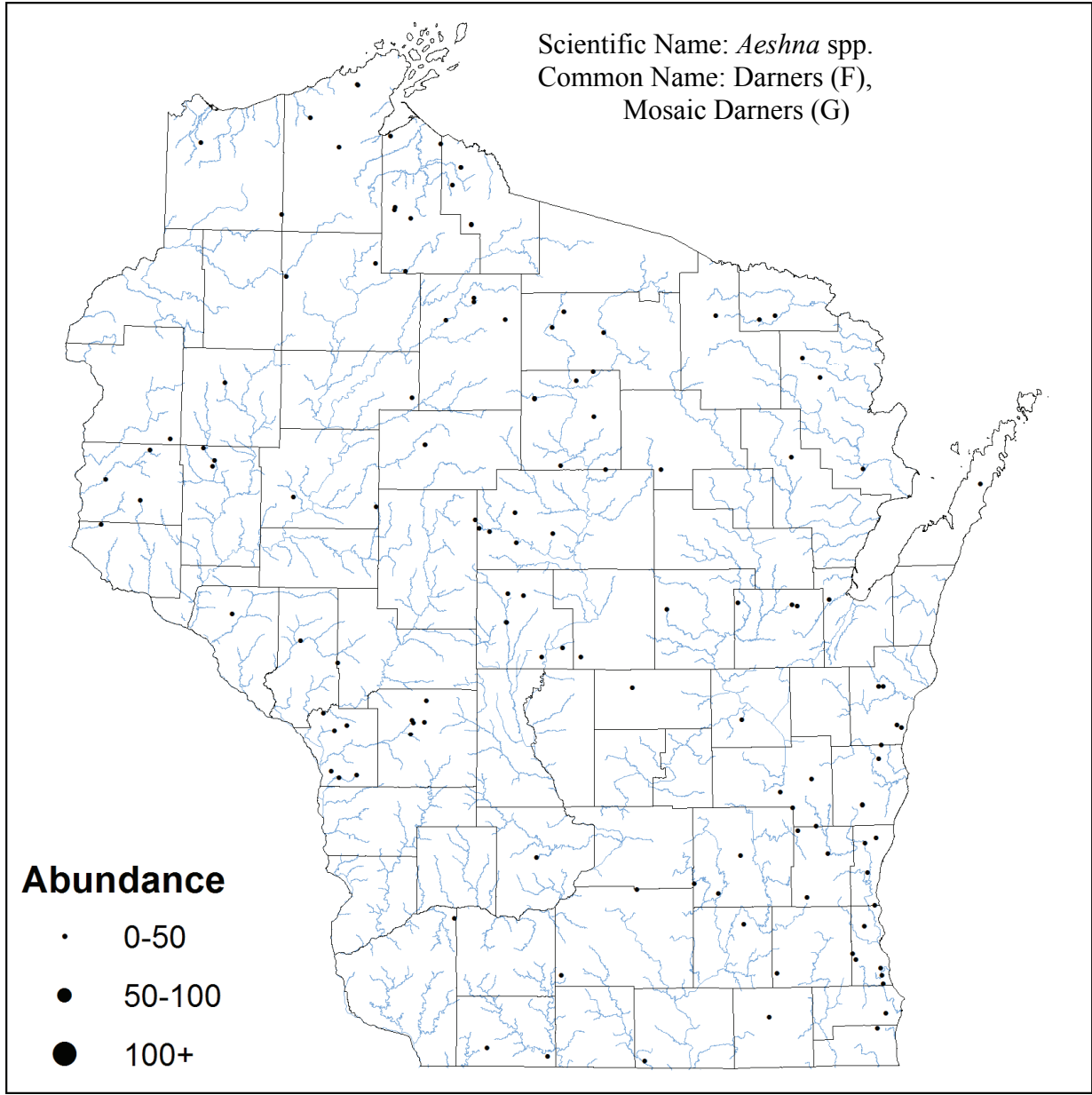




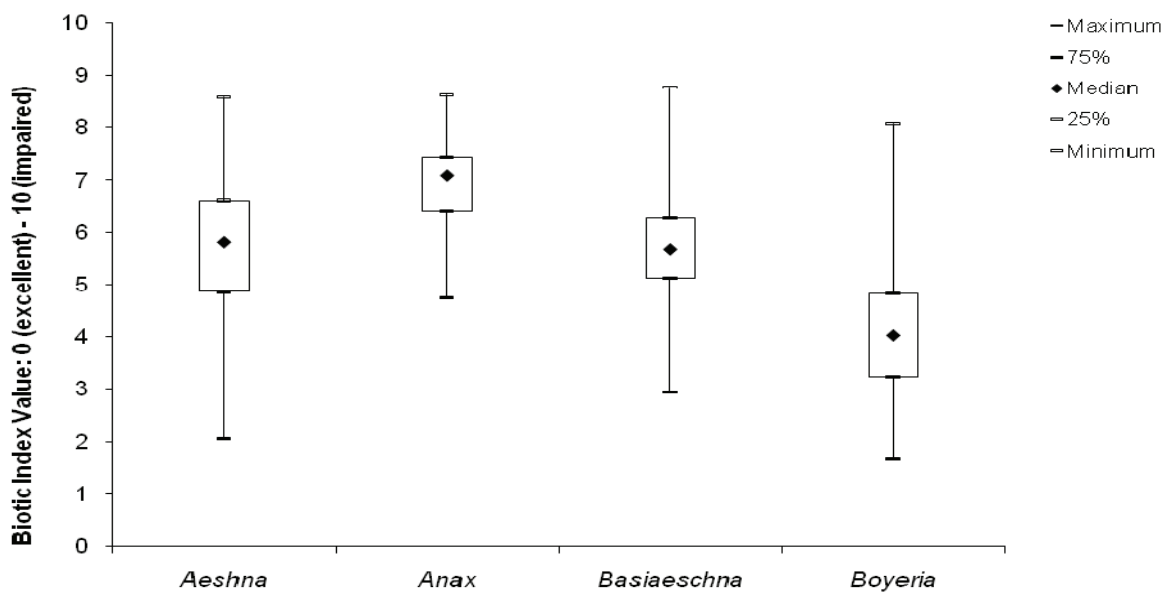
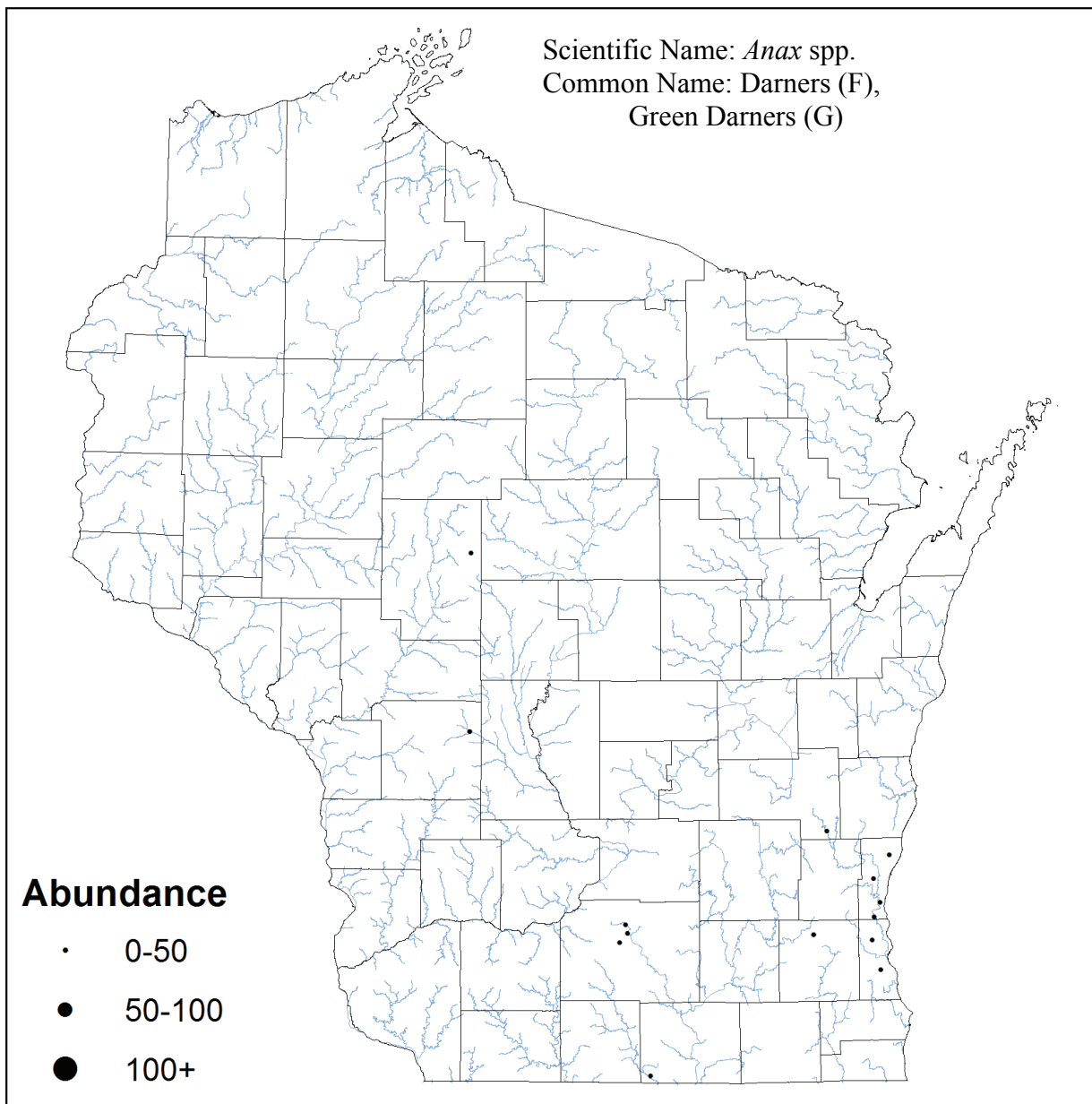


## Section IV: Odonata - Anisoptera (Dragonflies) and Zygoptera (Damselflies)

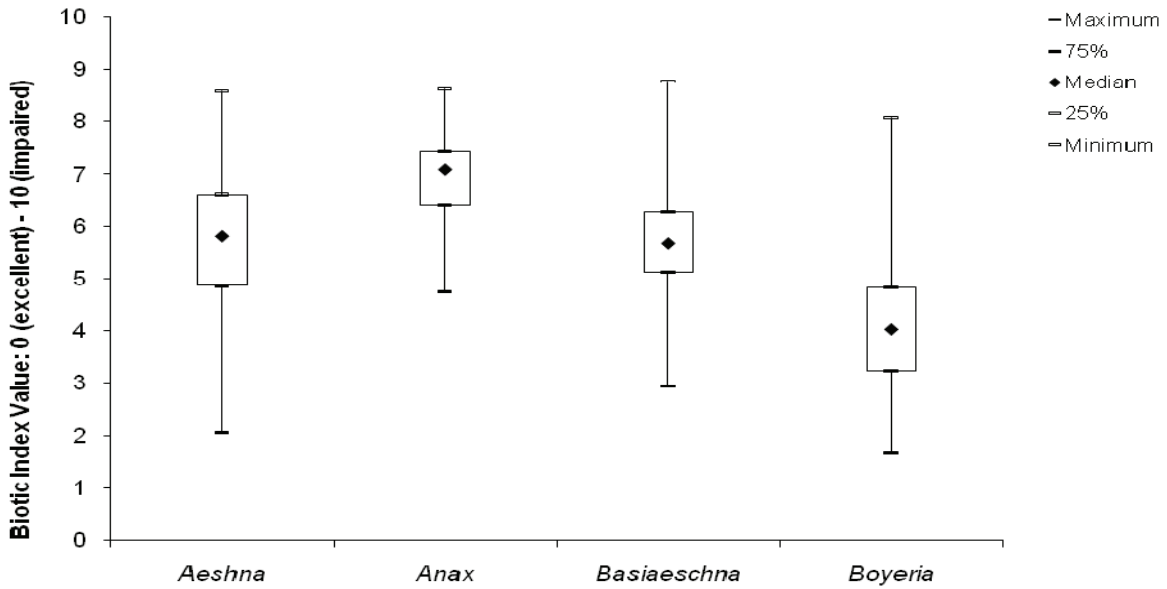
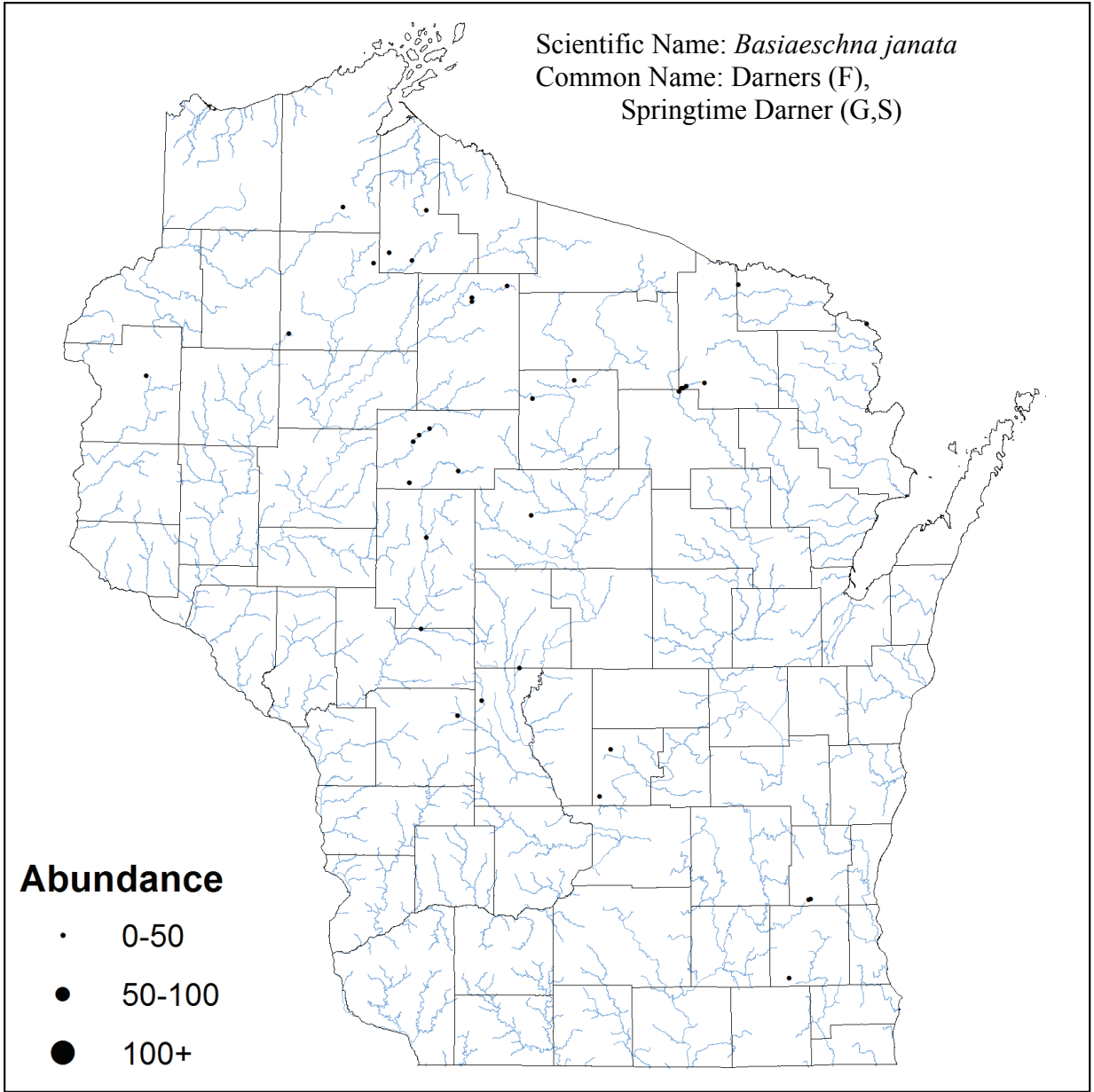
# Odonata Aeshnidae

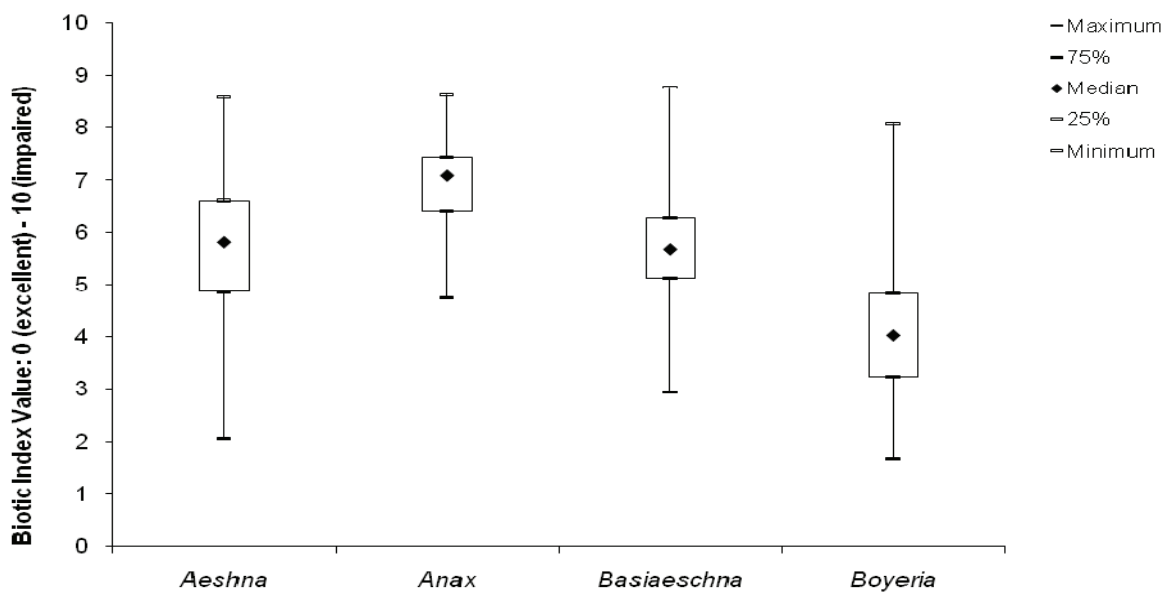
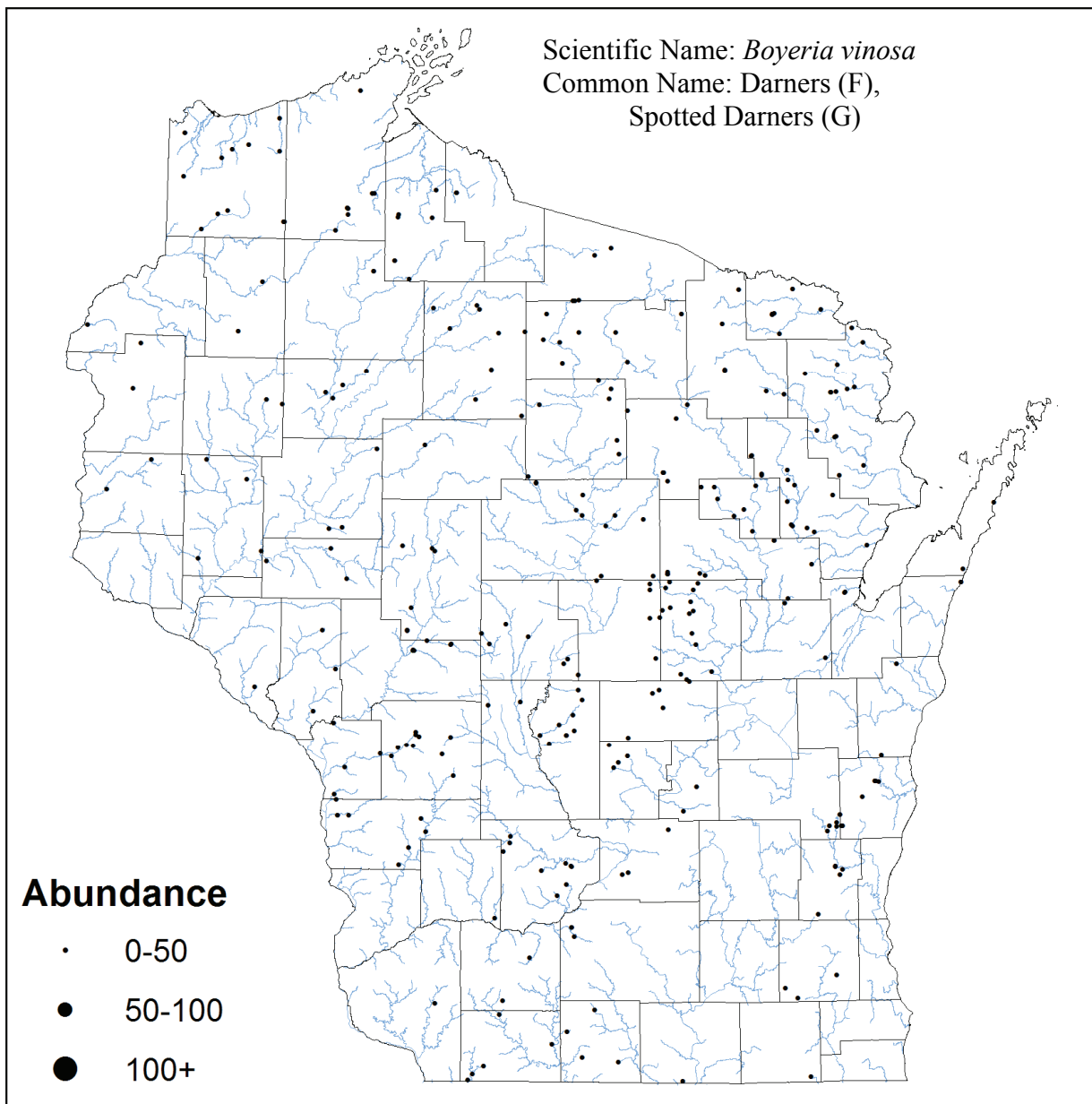


# Odonata Aeshnidae

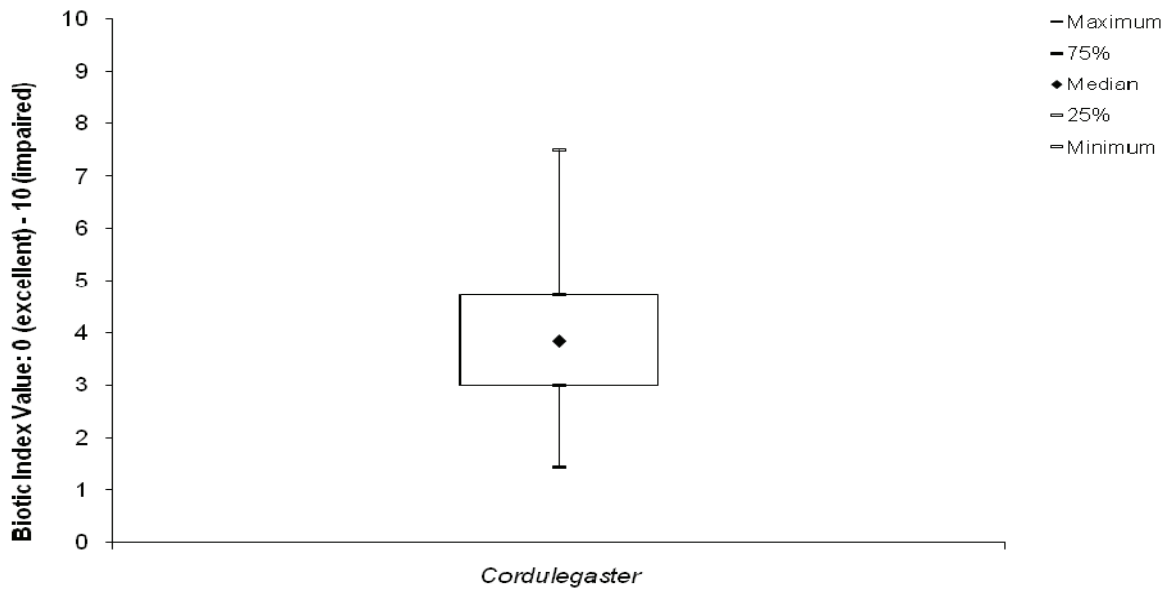
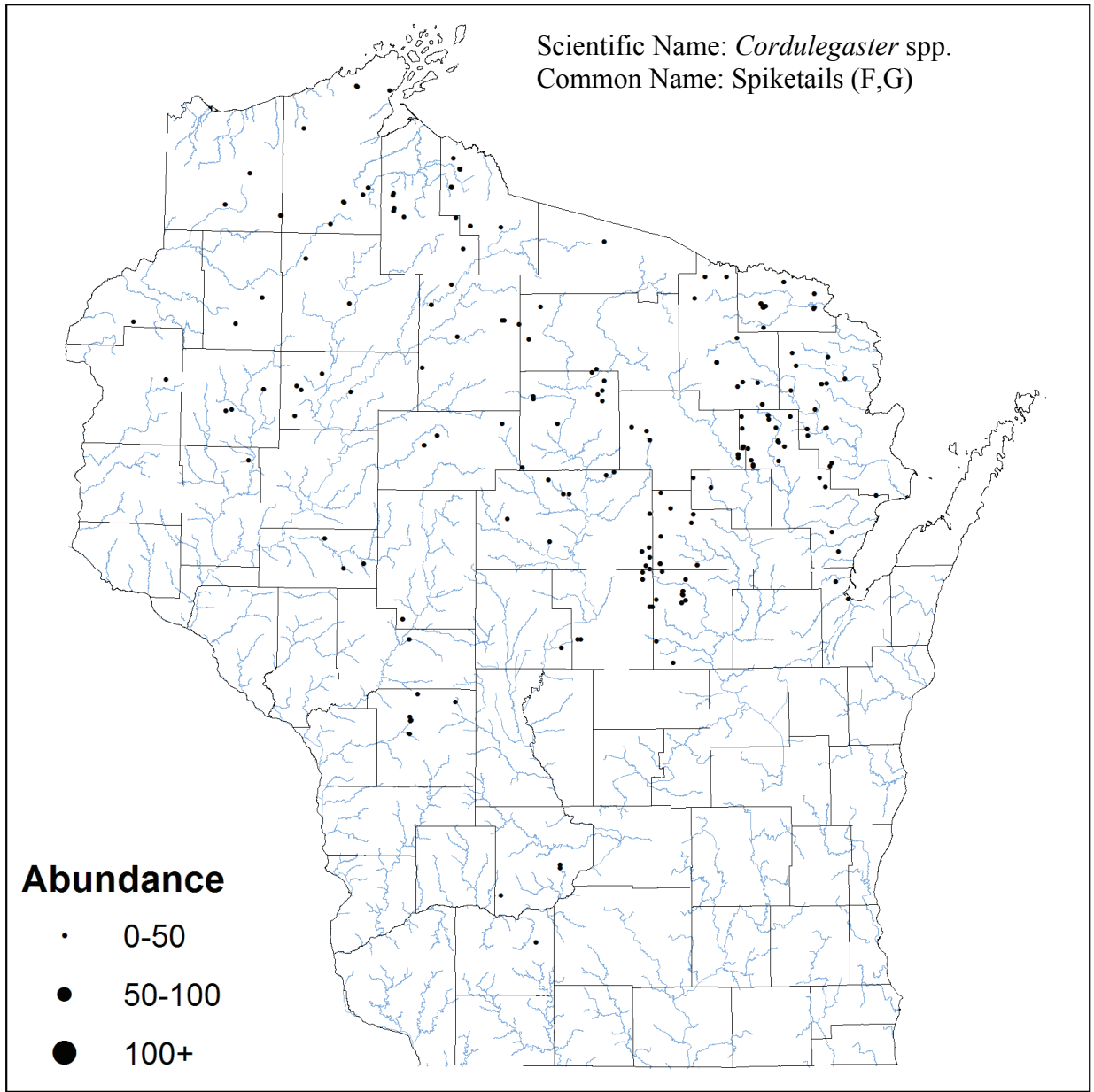


# Odonata Aeshnidae

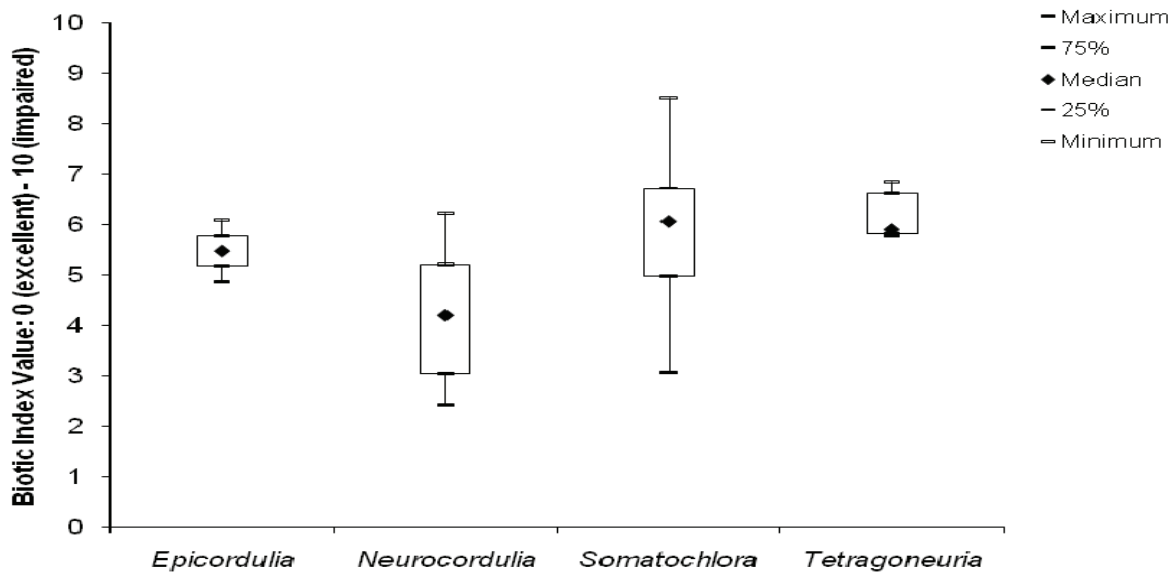
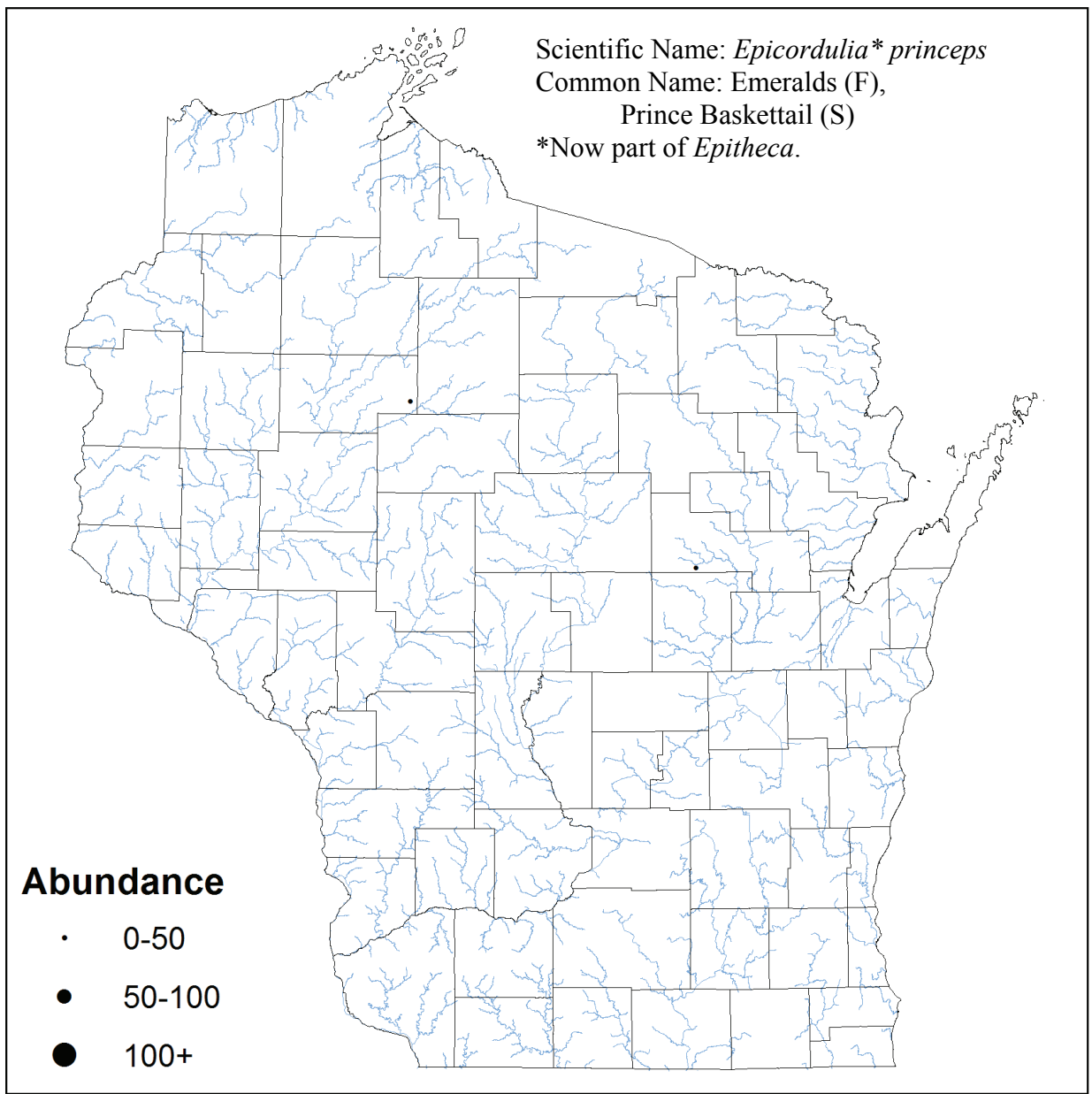




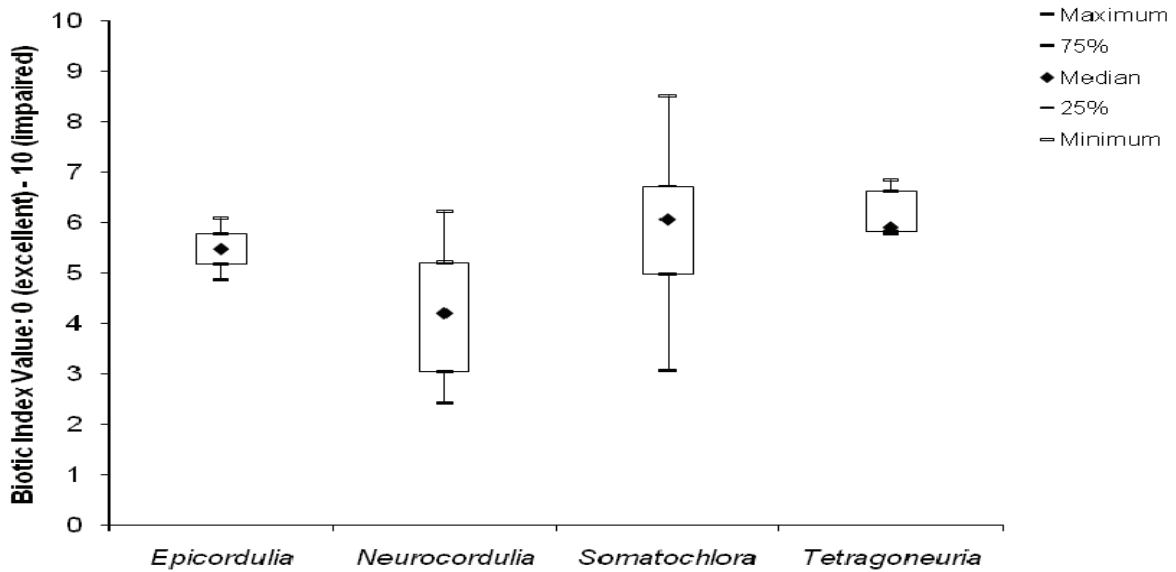
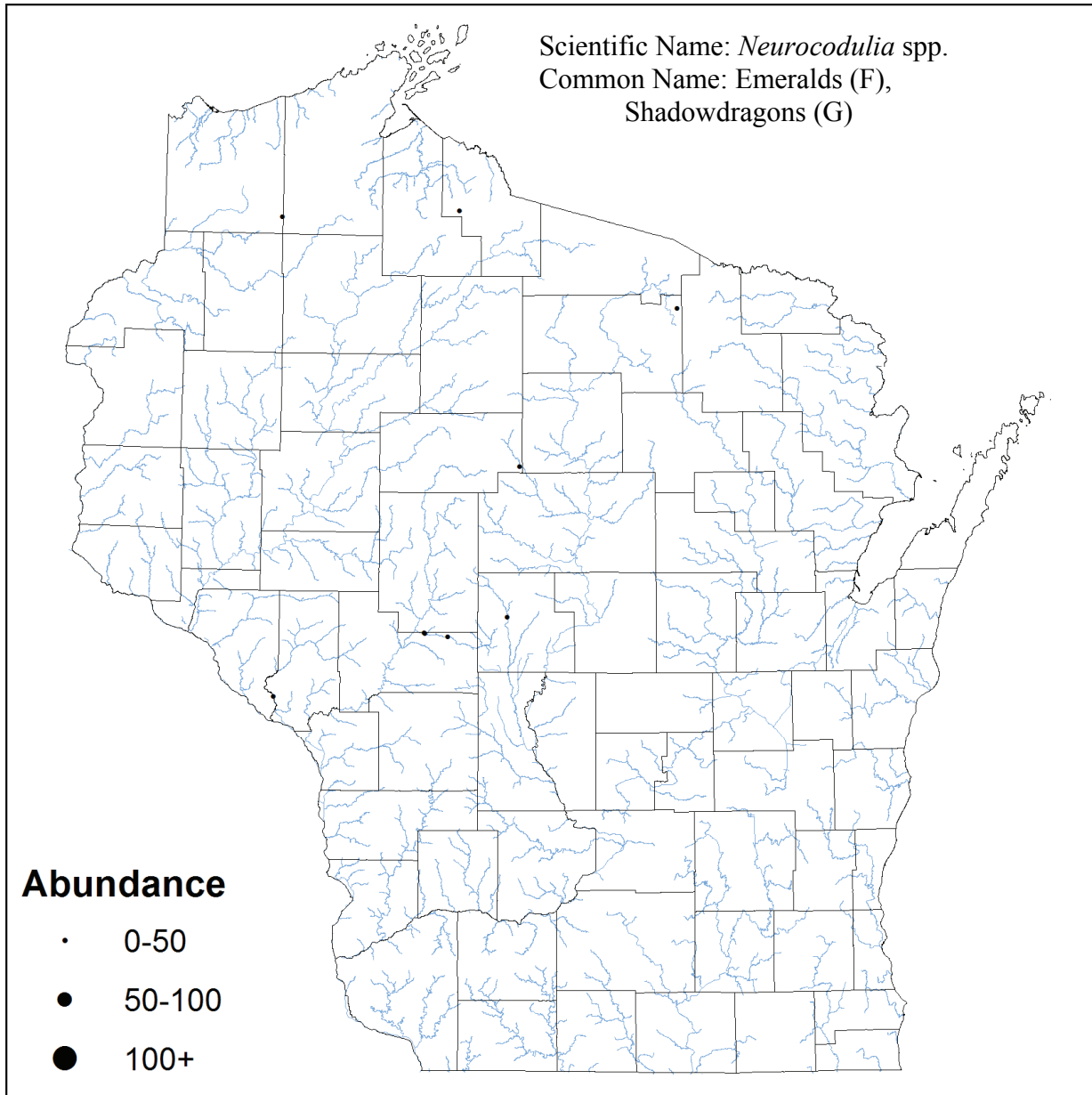
# Odonata Cordulegastridae

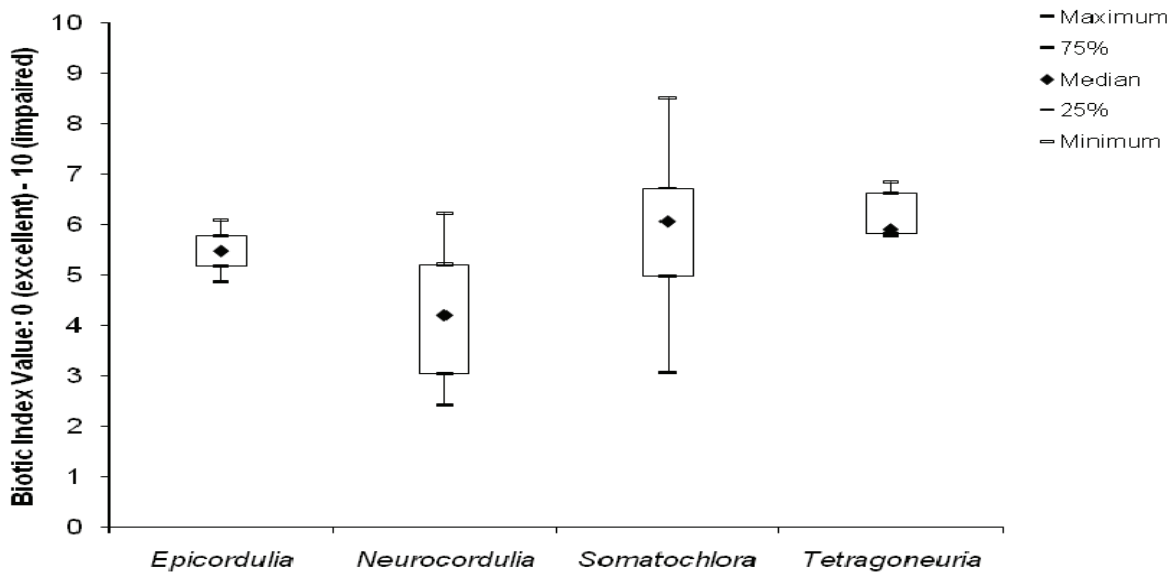
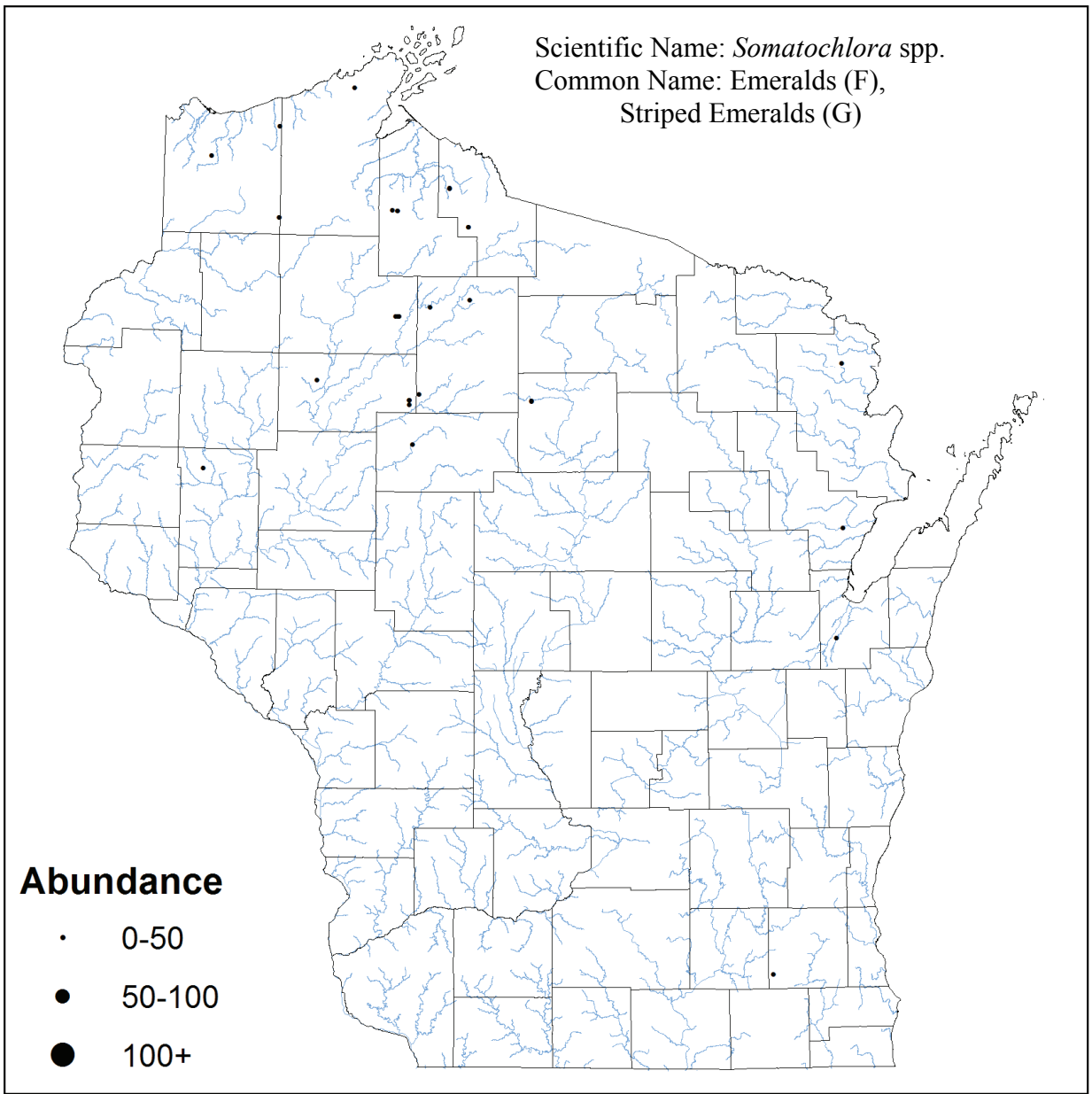




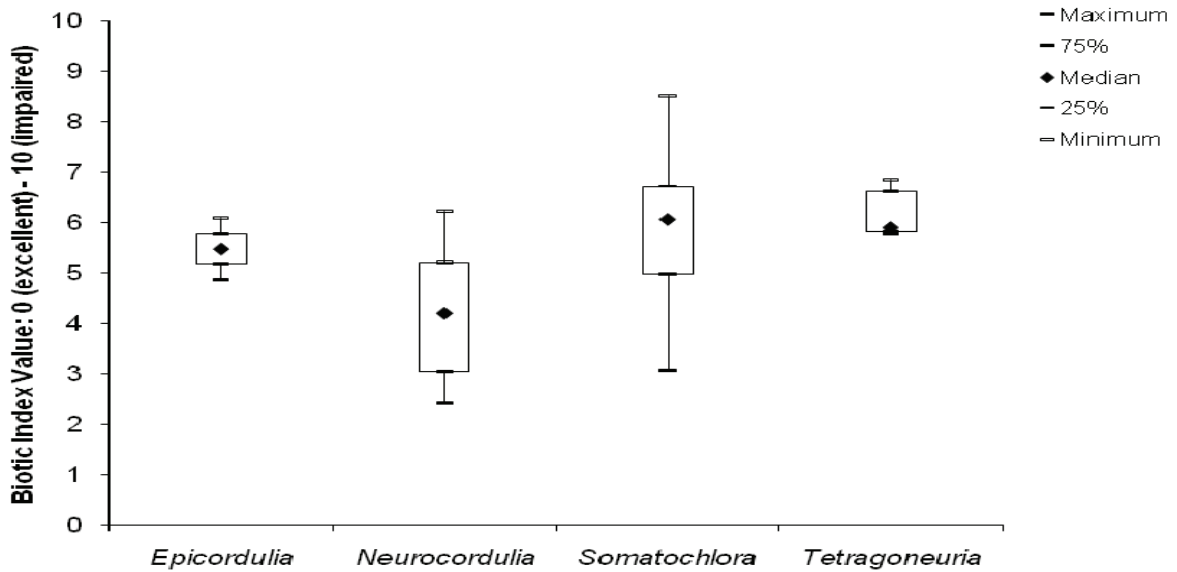
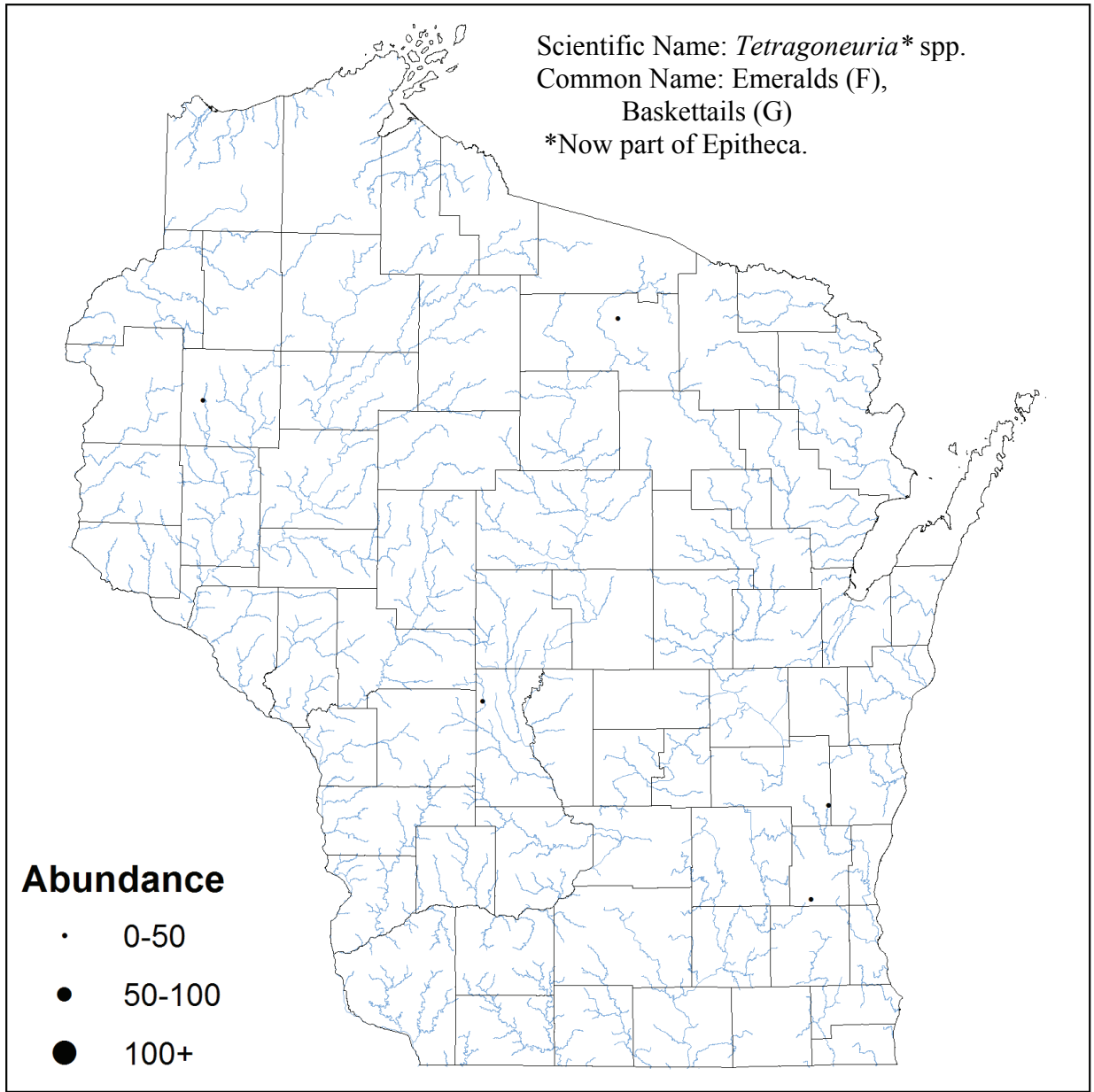


# Odonata Corduliinae

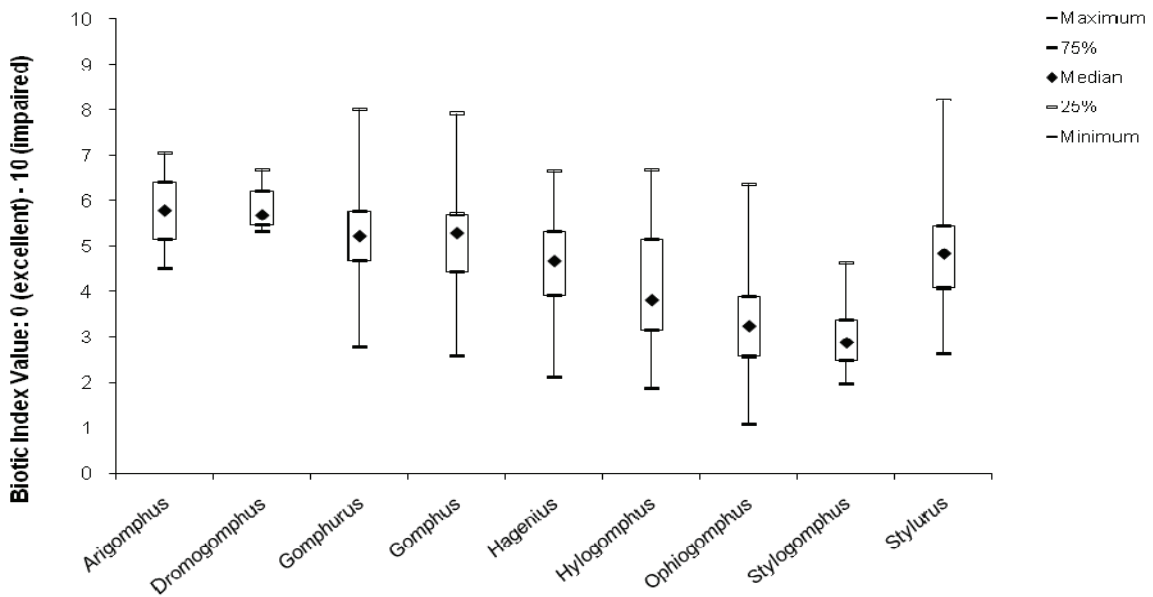
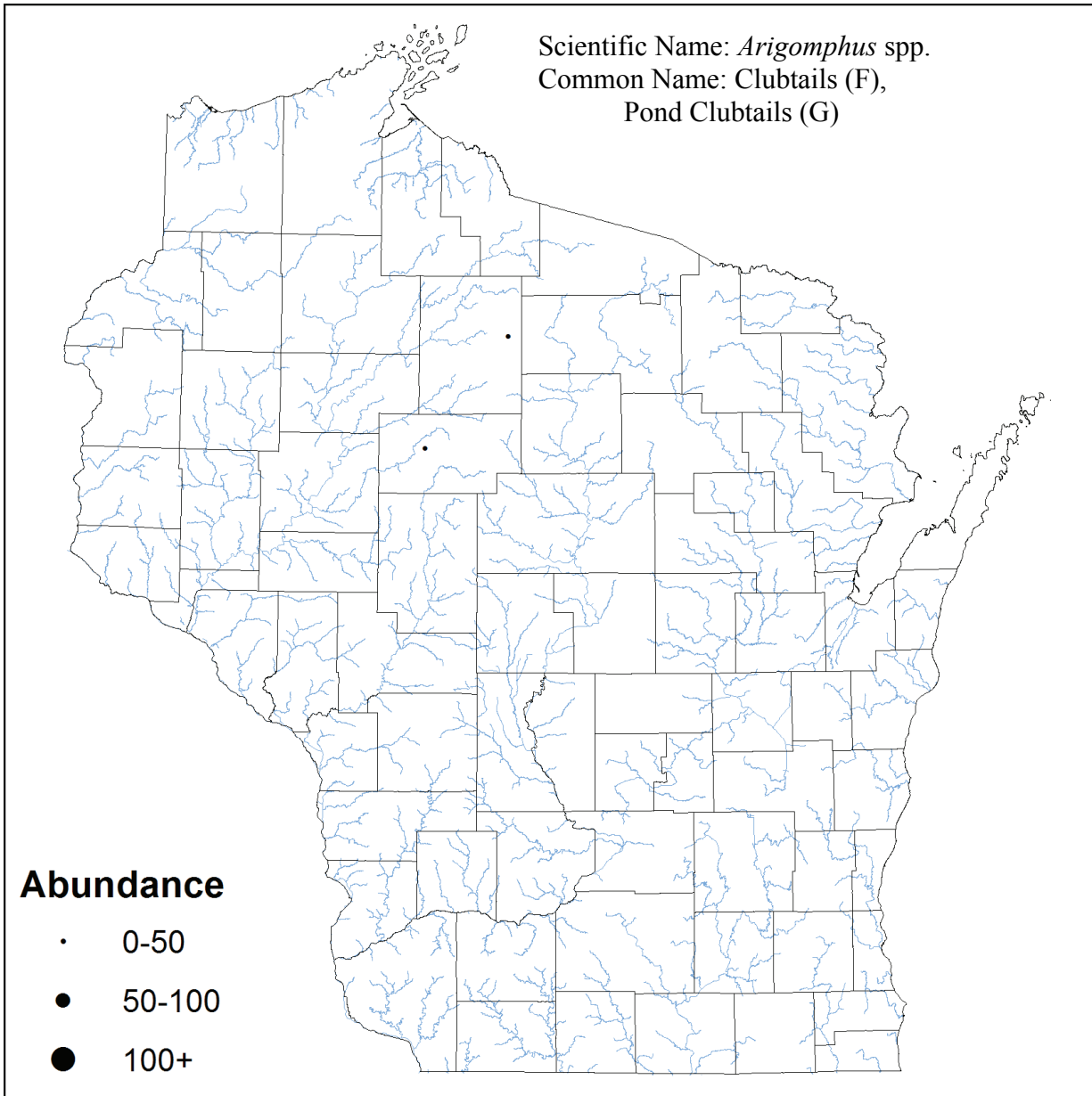




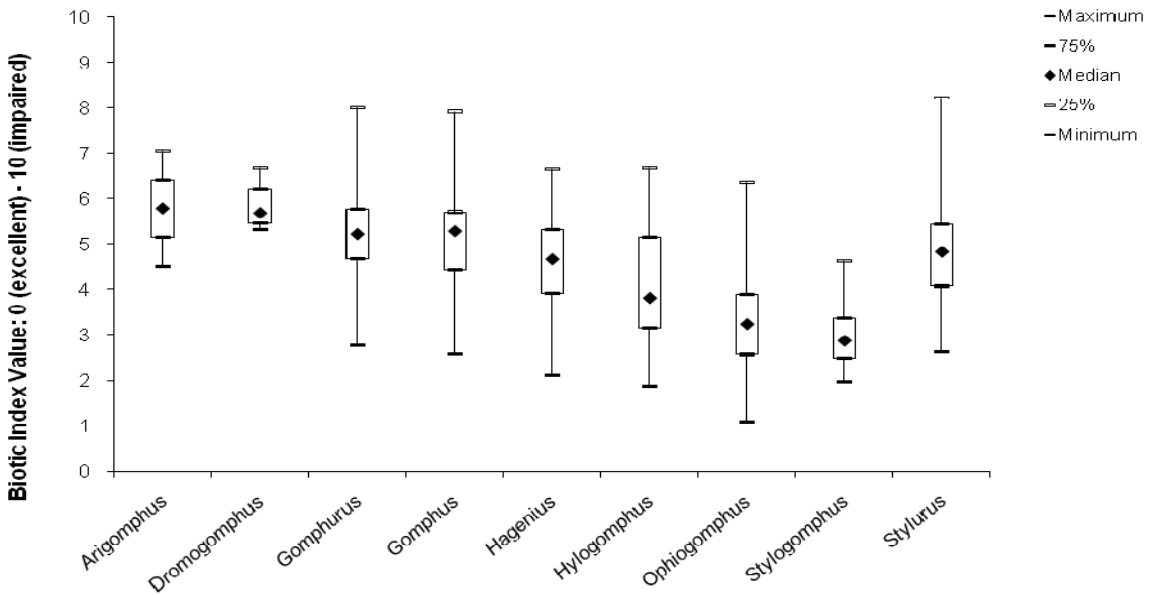
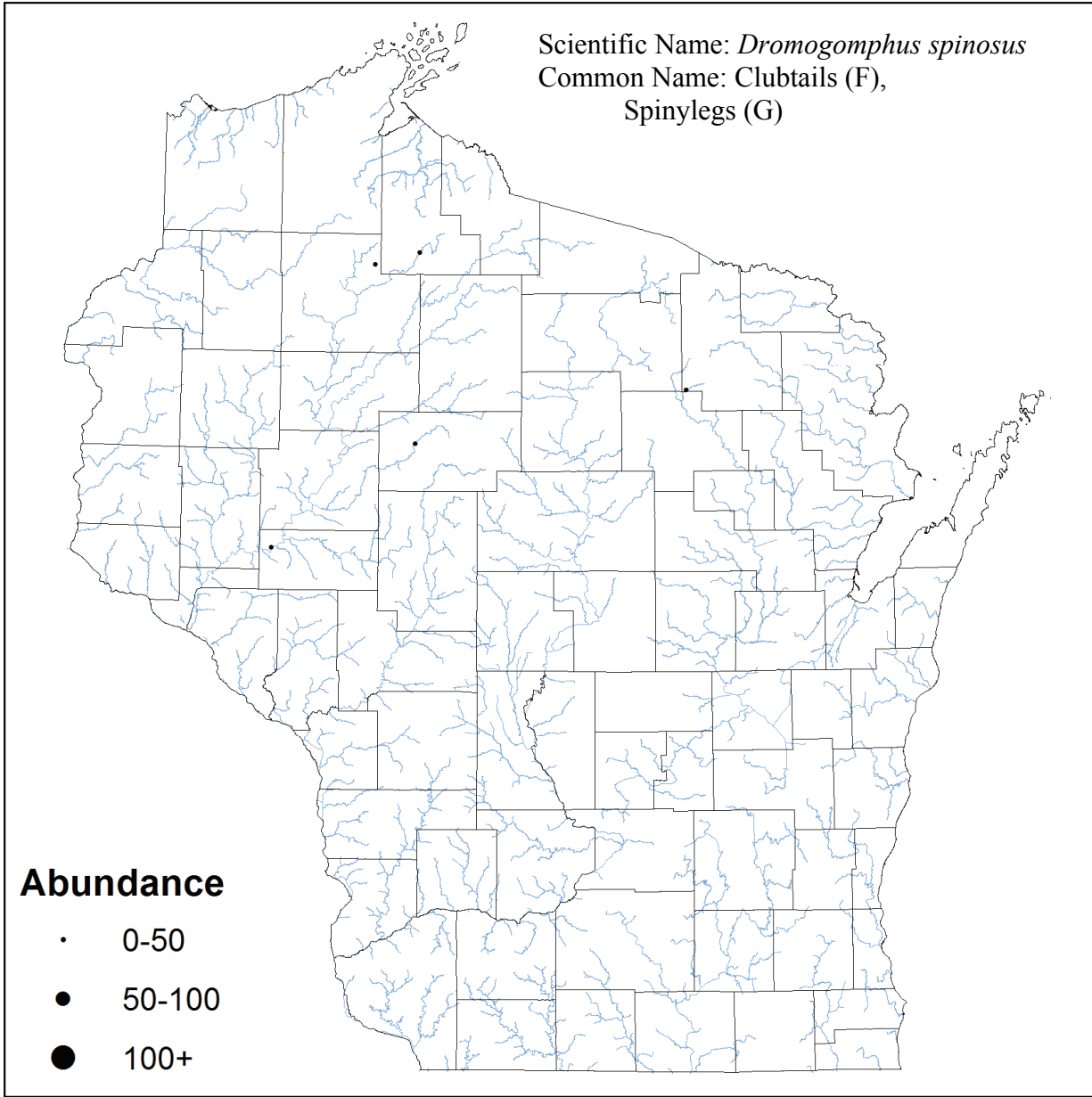
# Odonata Corduliinae



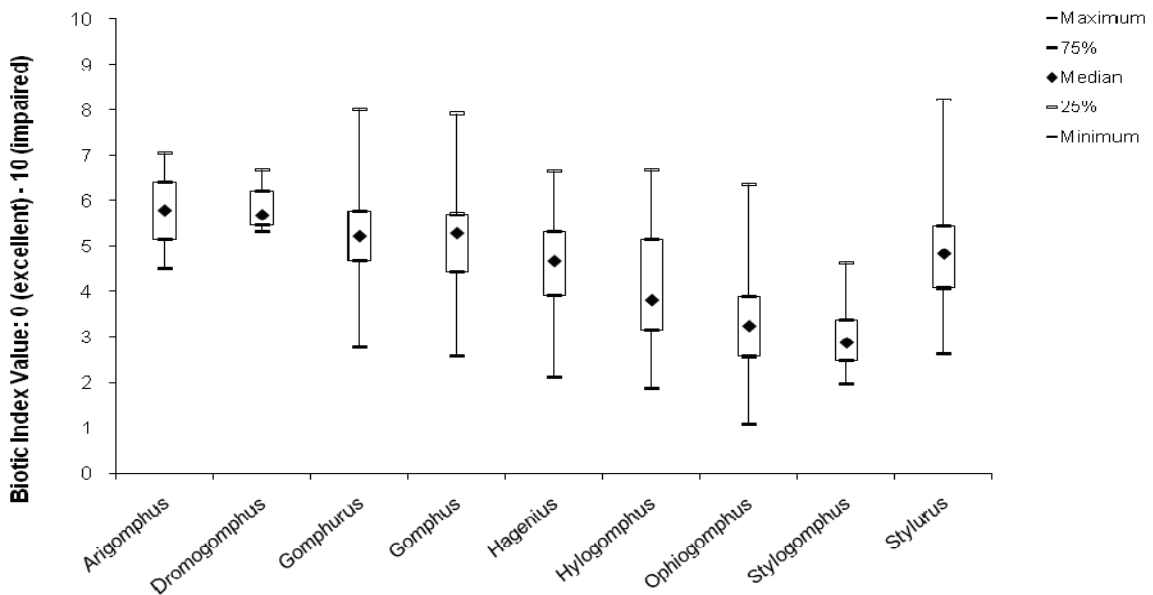
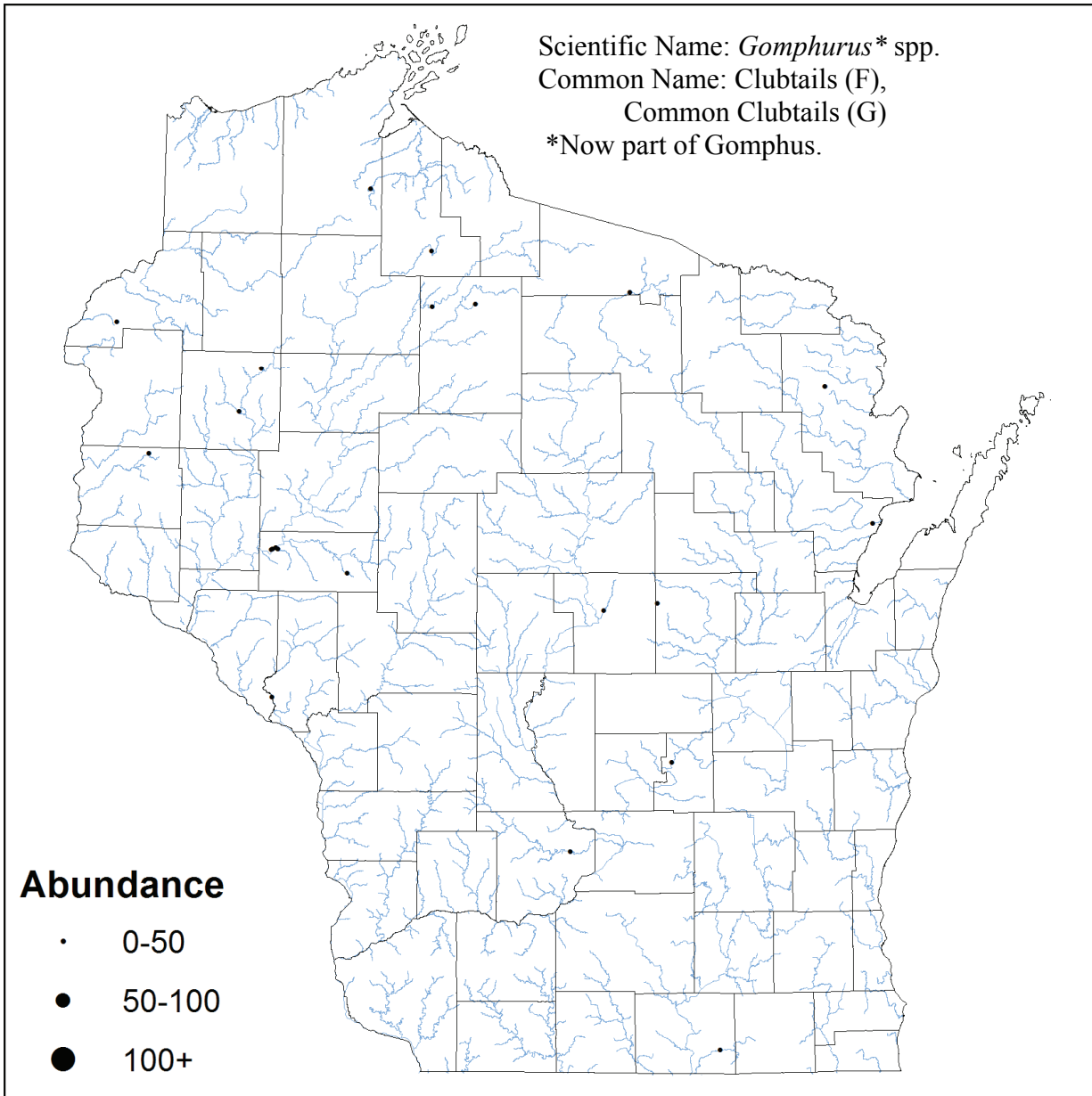
# Odonata Gomphidae



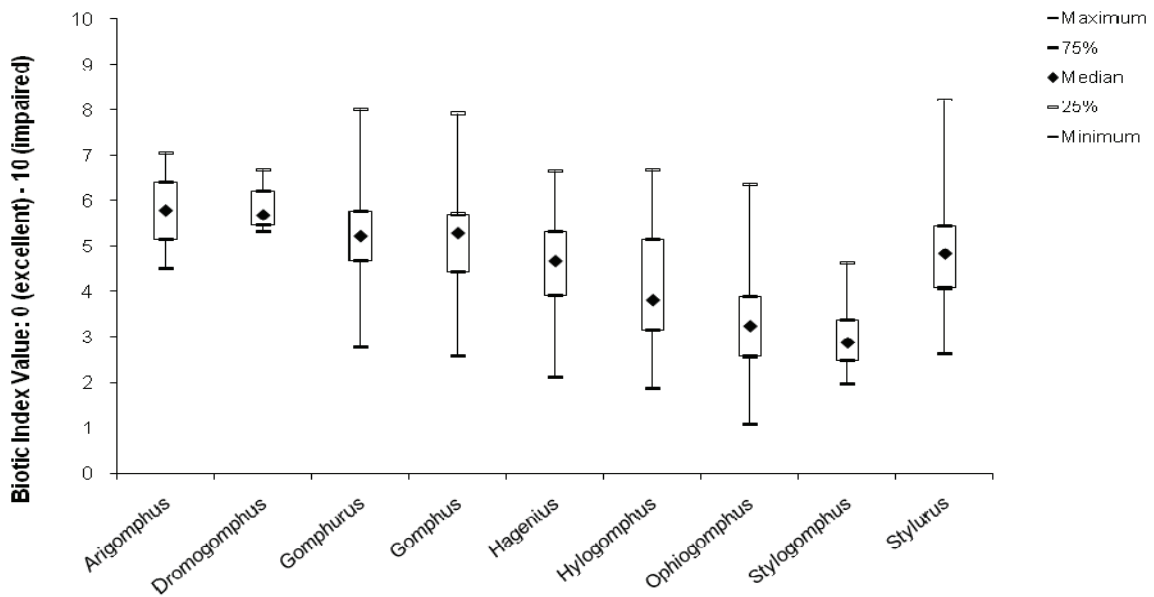
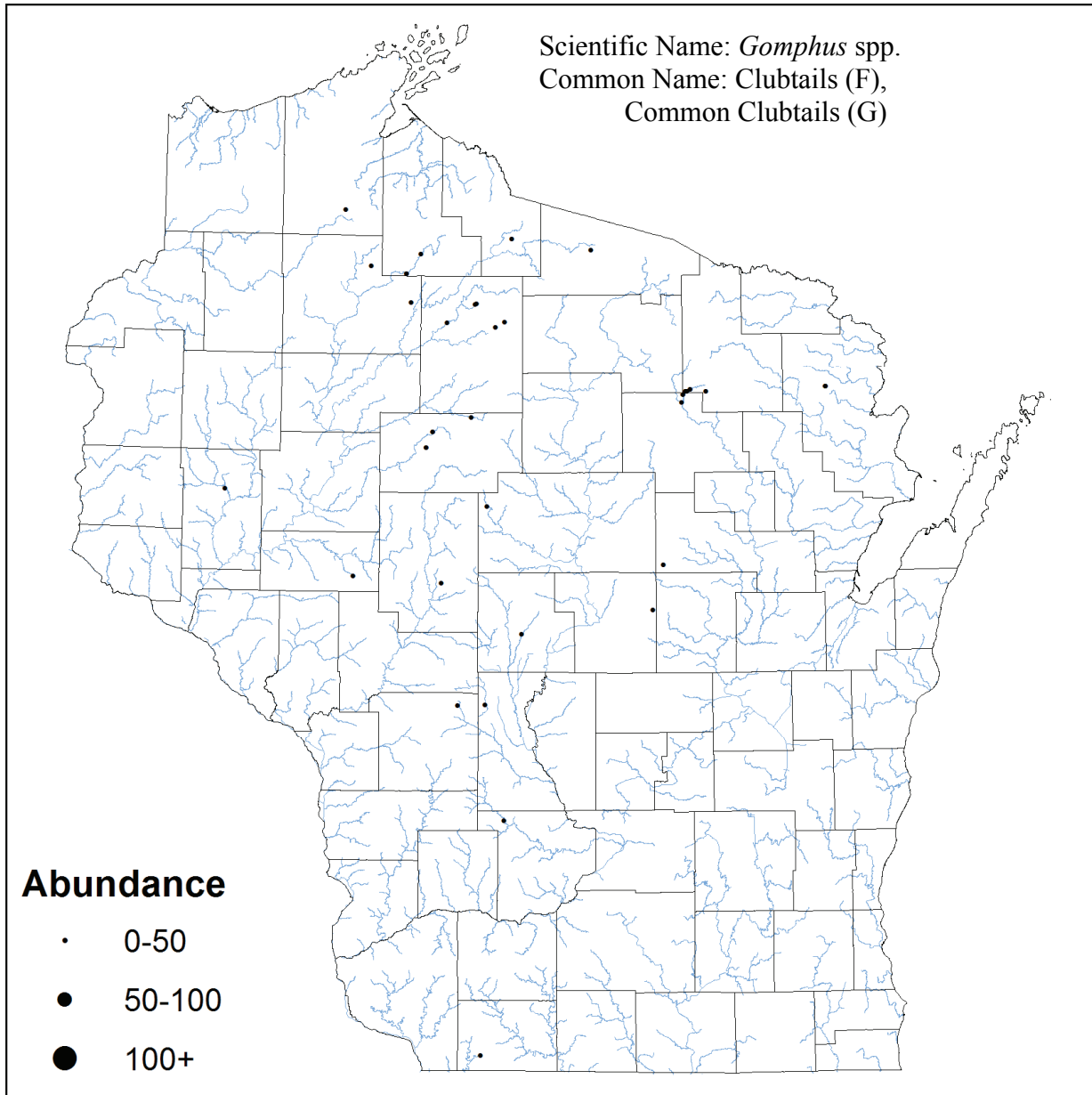
# Odonata Gomphidae



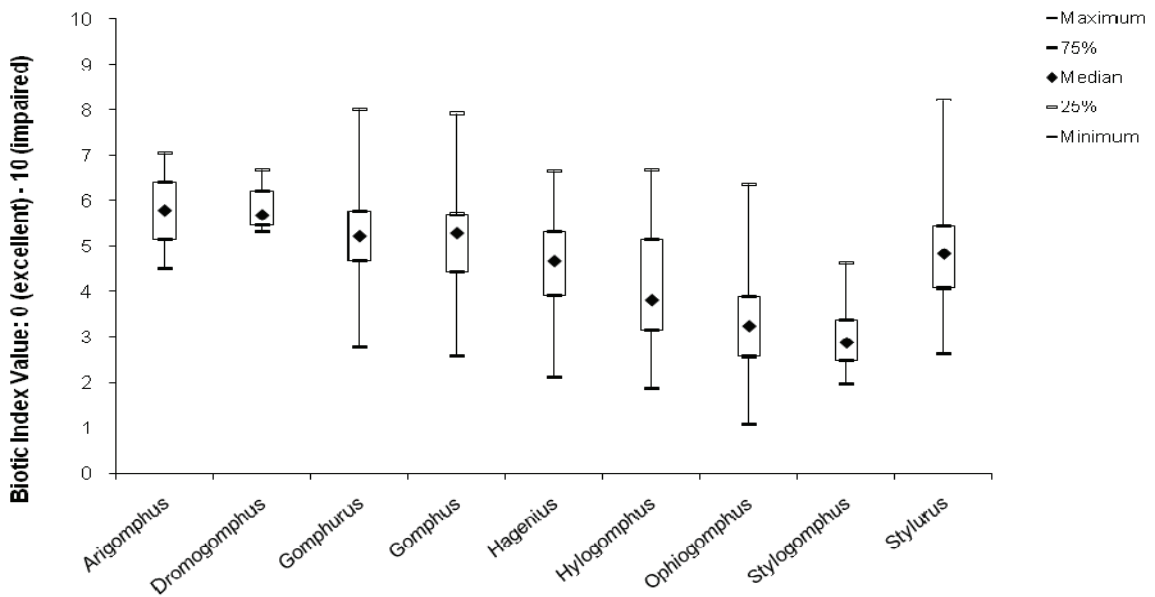
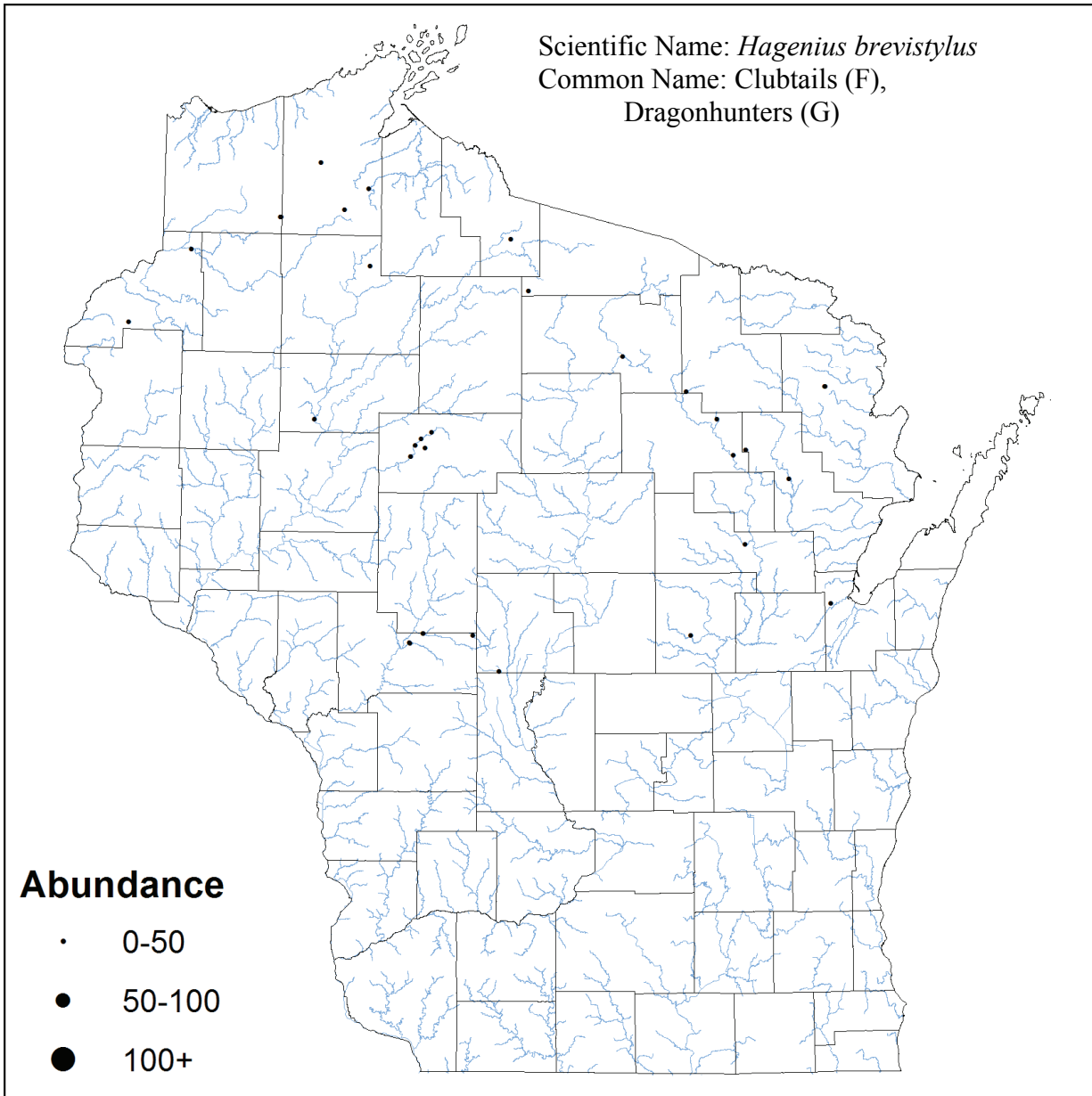
# Odonata Gomphidae



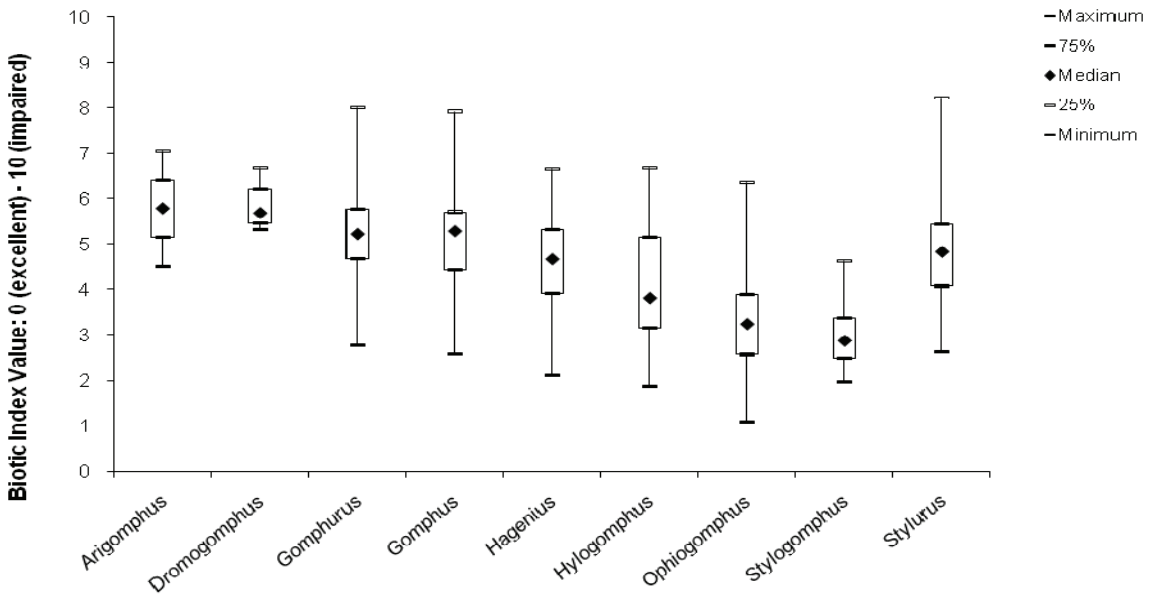
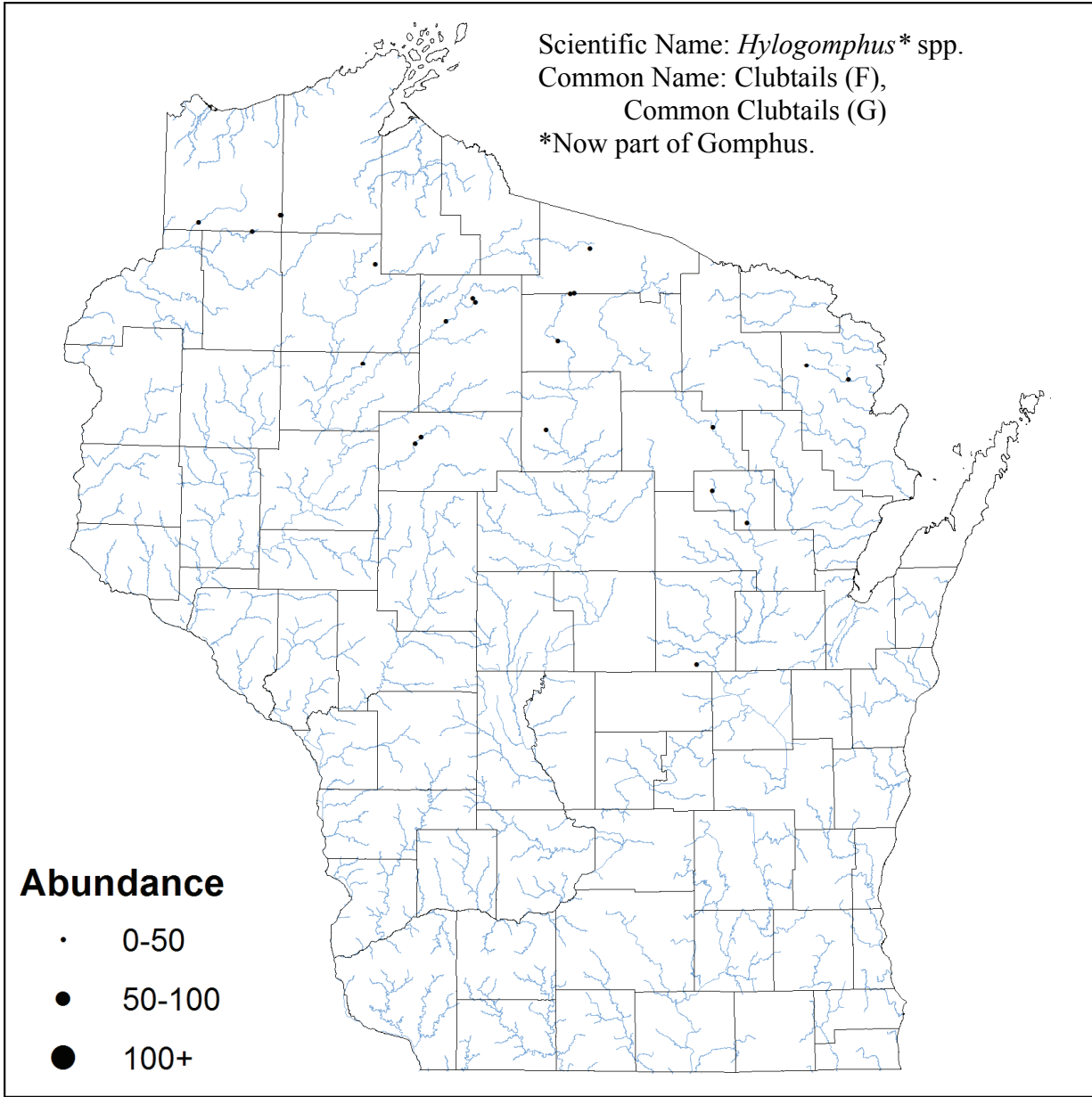
# Odonata Gomphidae



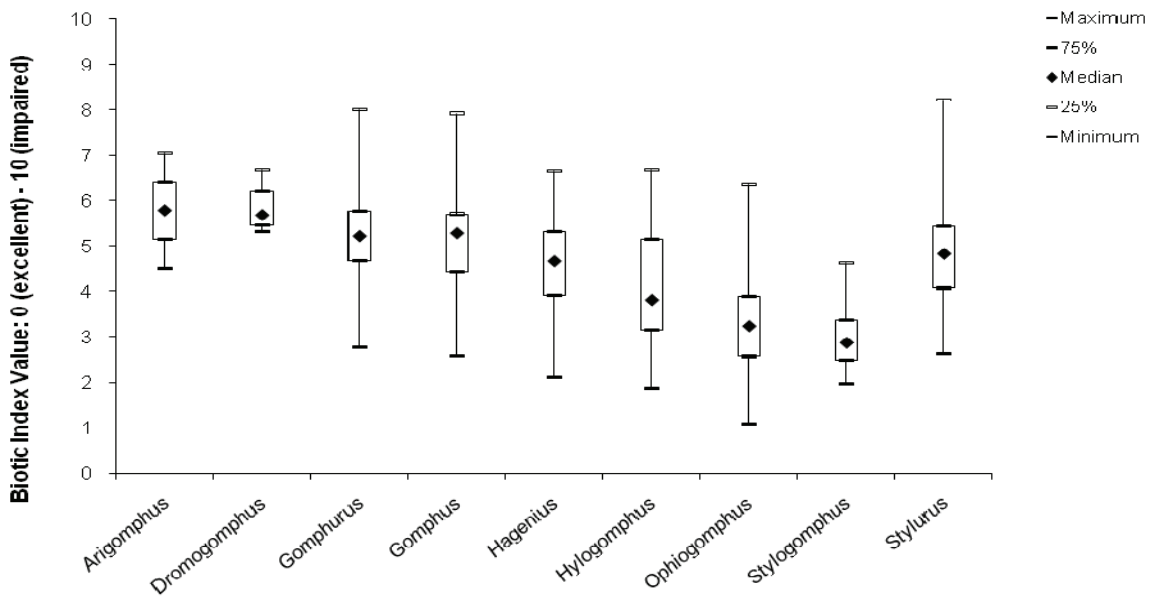
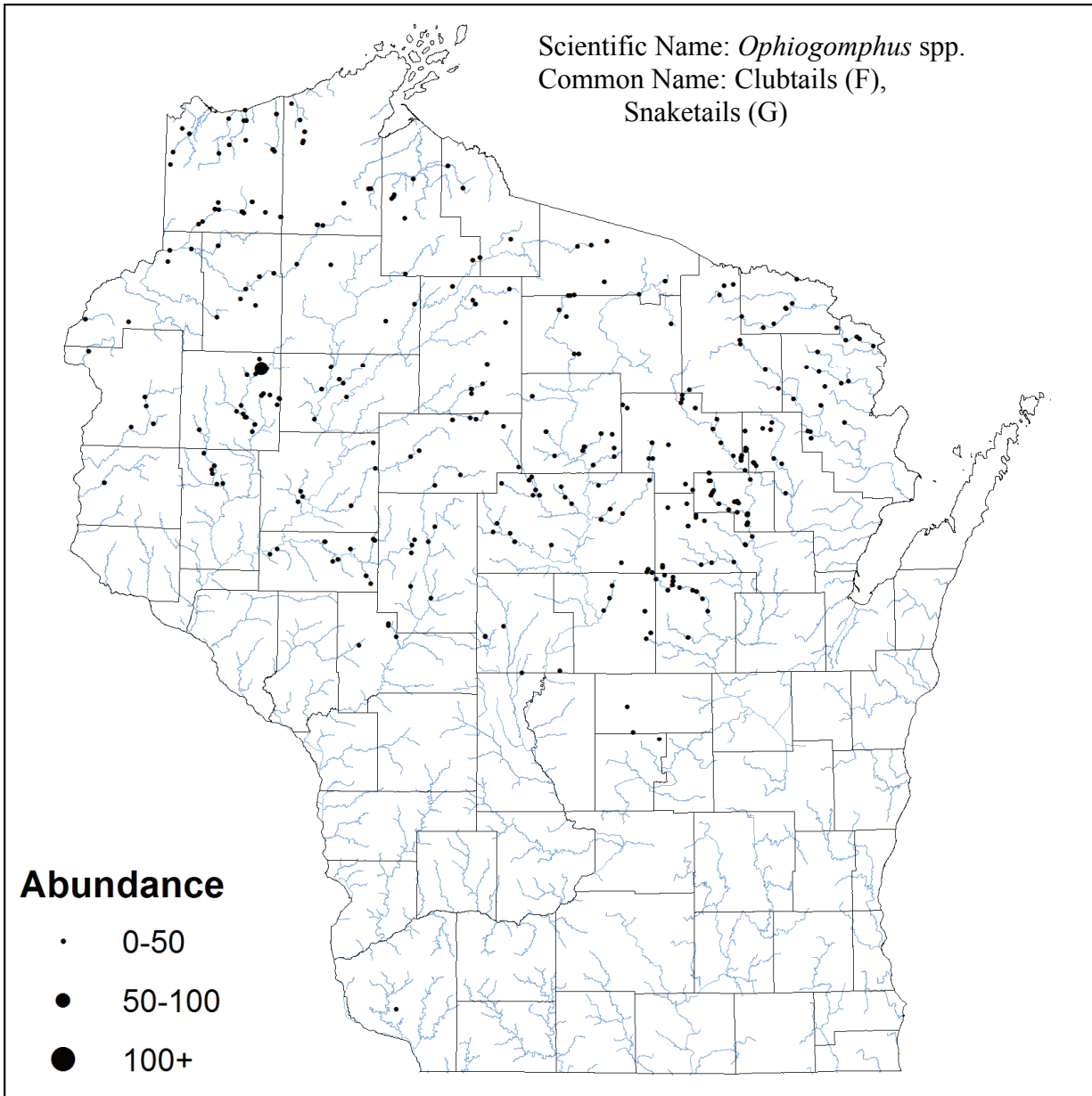




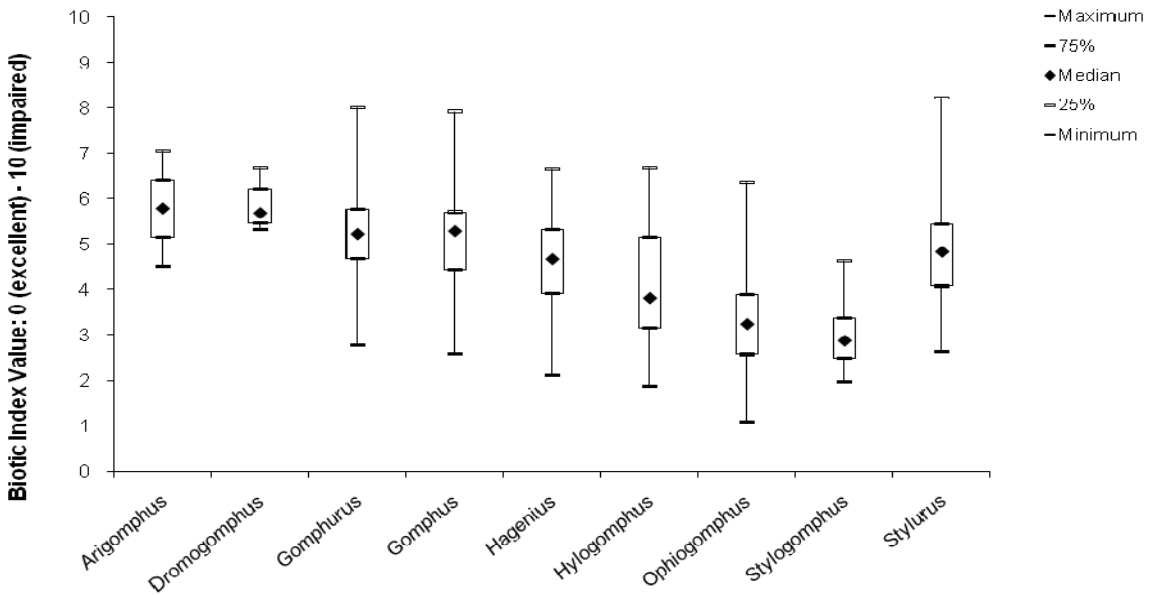
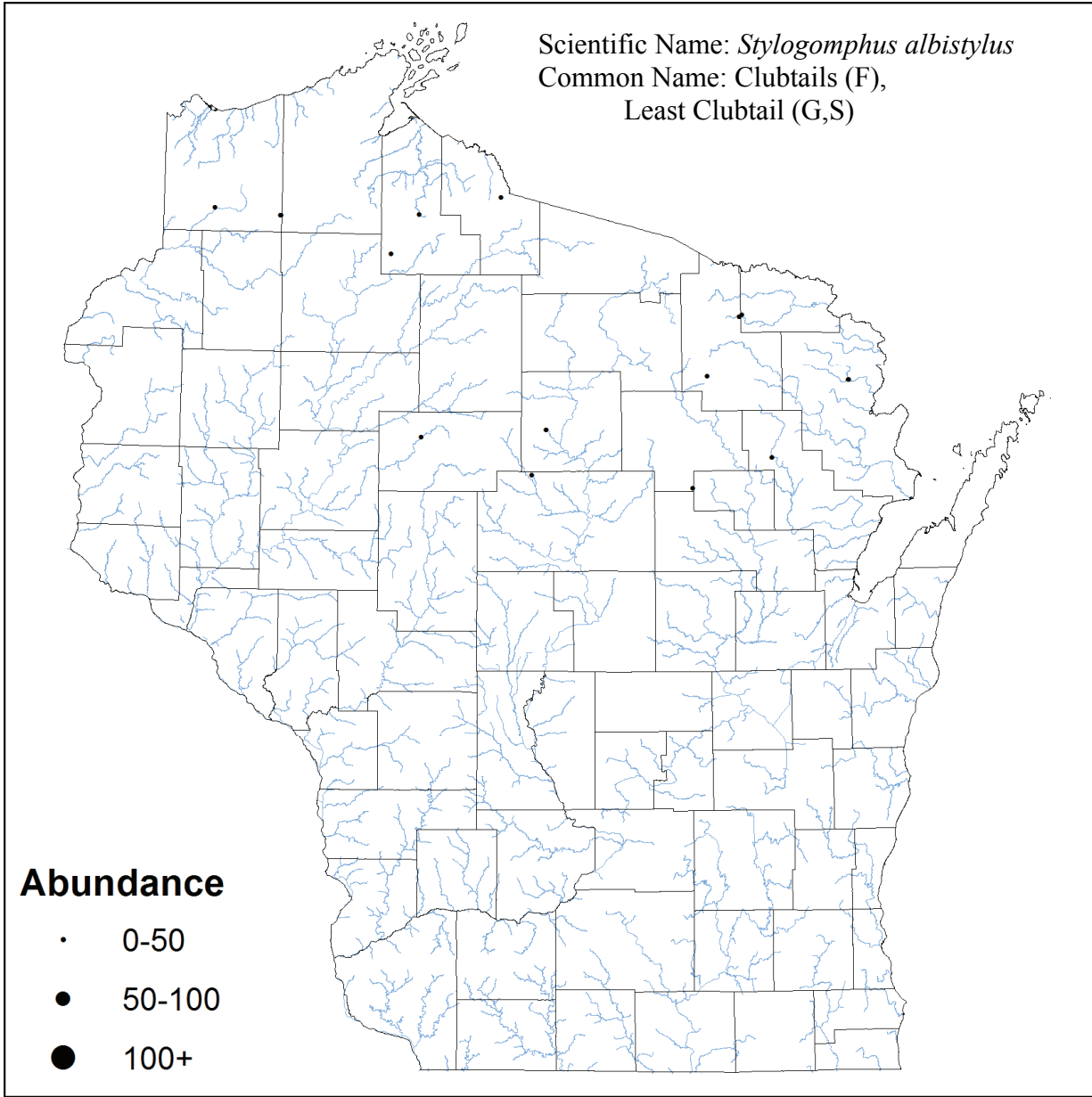
# Odonata Gomphidae



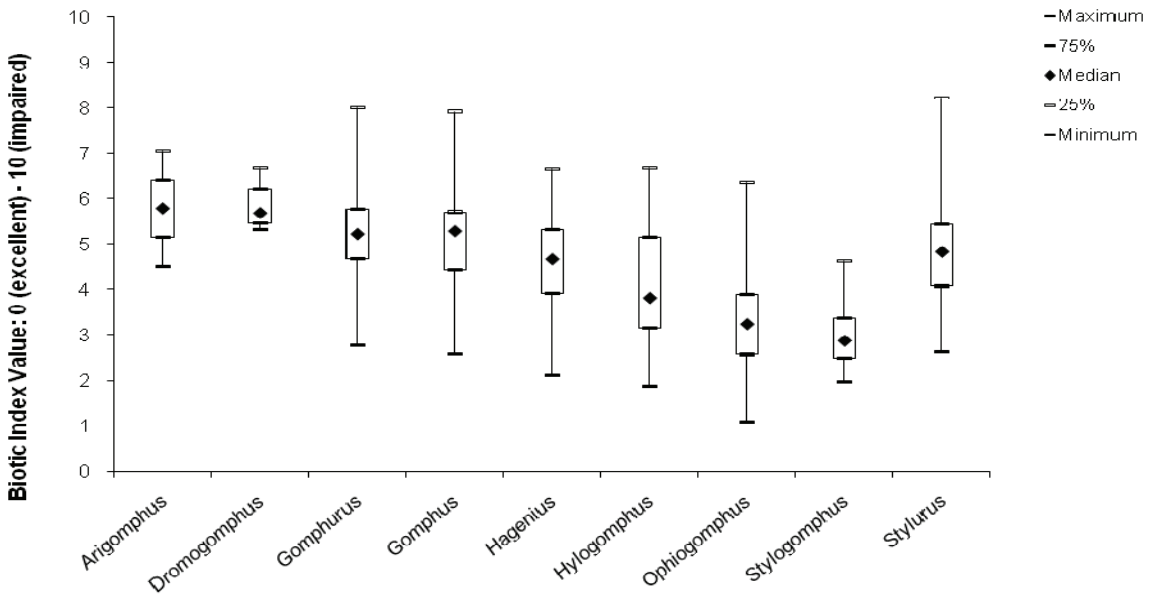
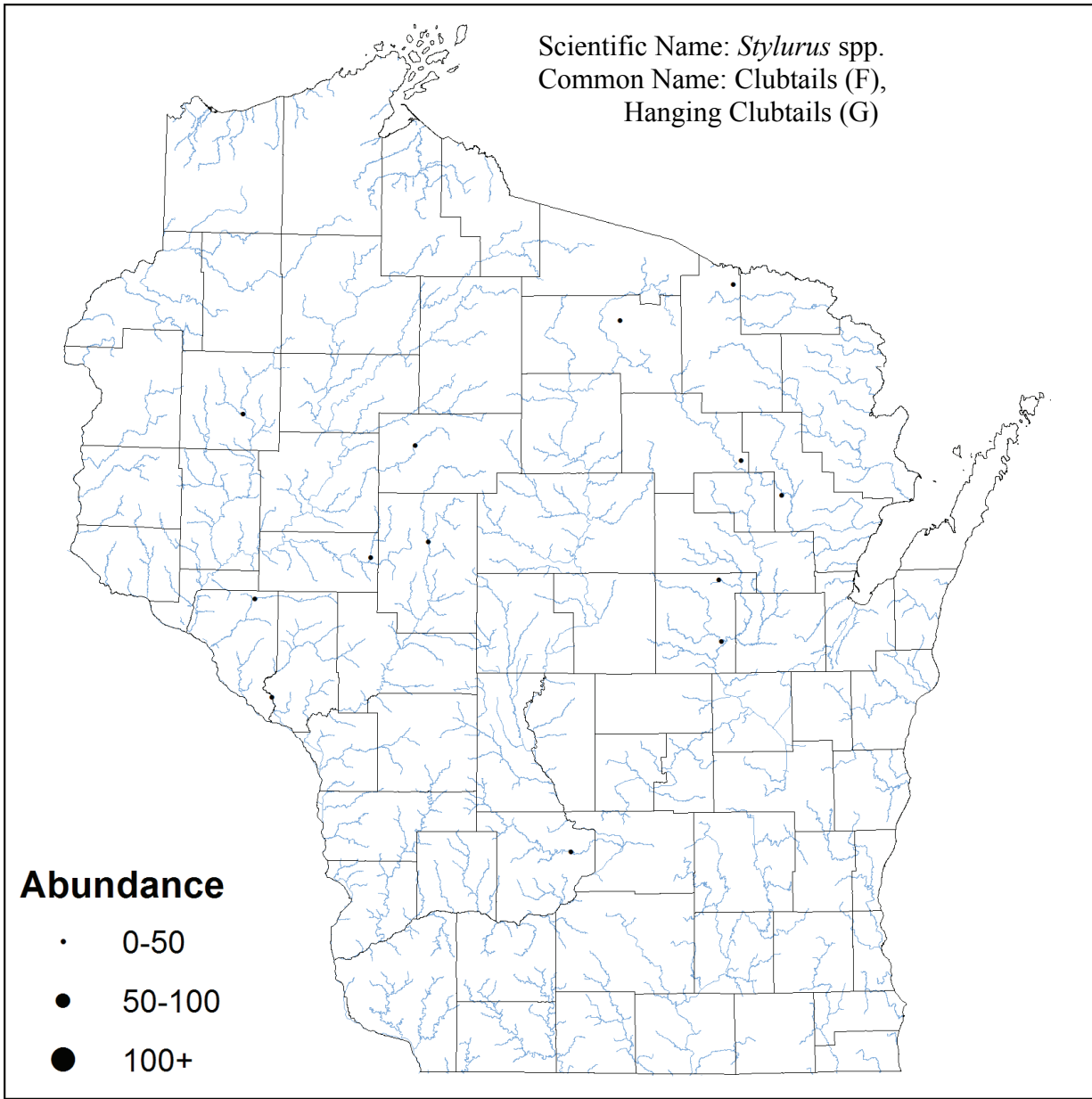
# Odonata Gomphidae



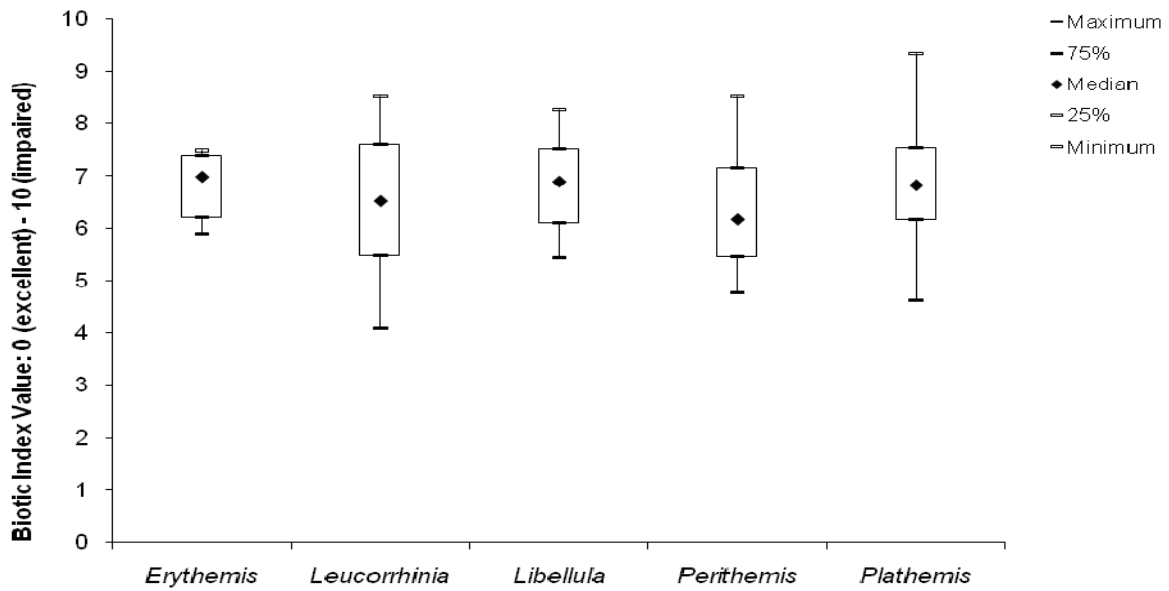
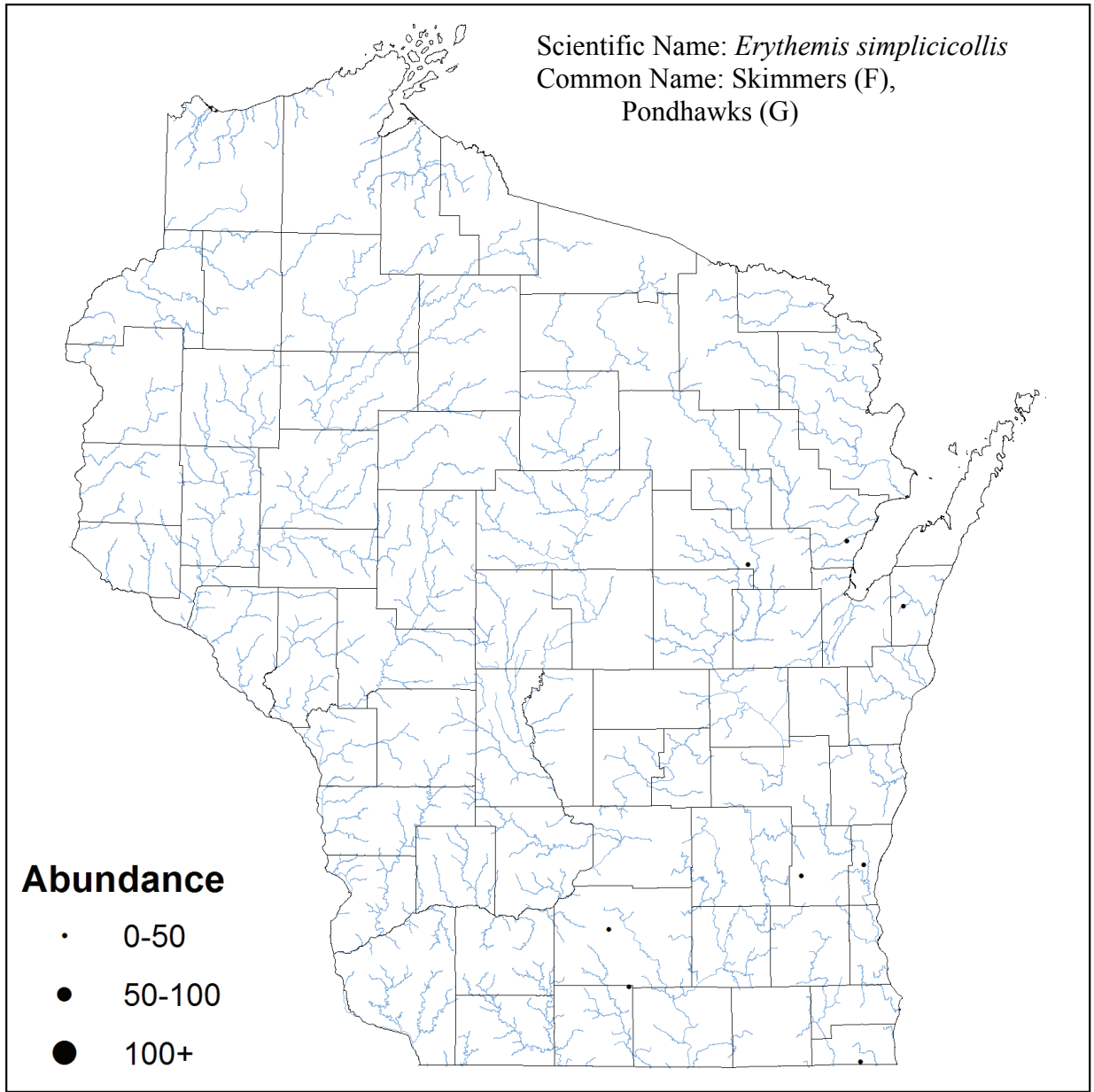
# Odonata Gomphidae

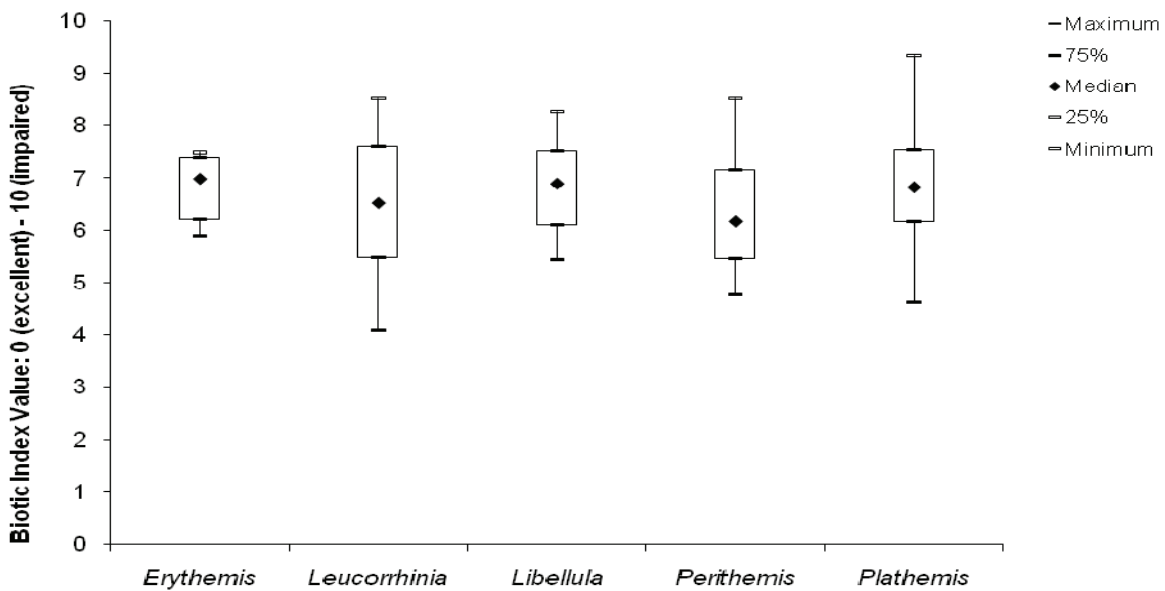
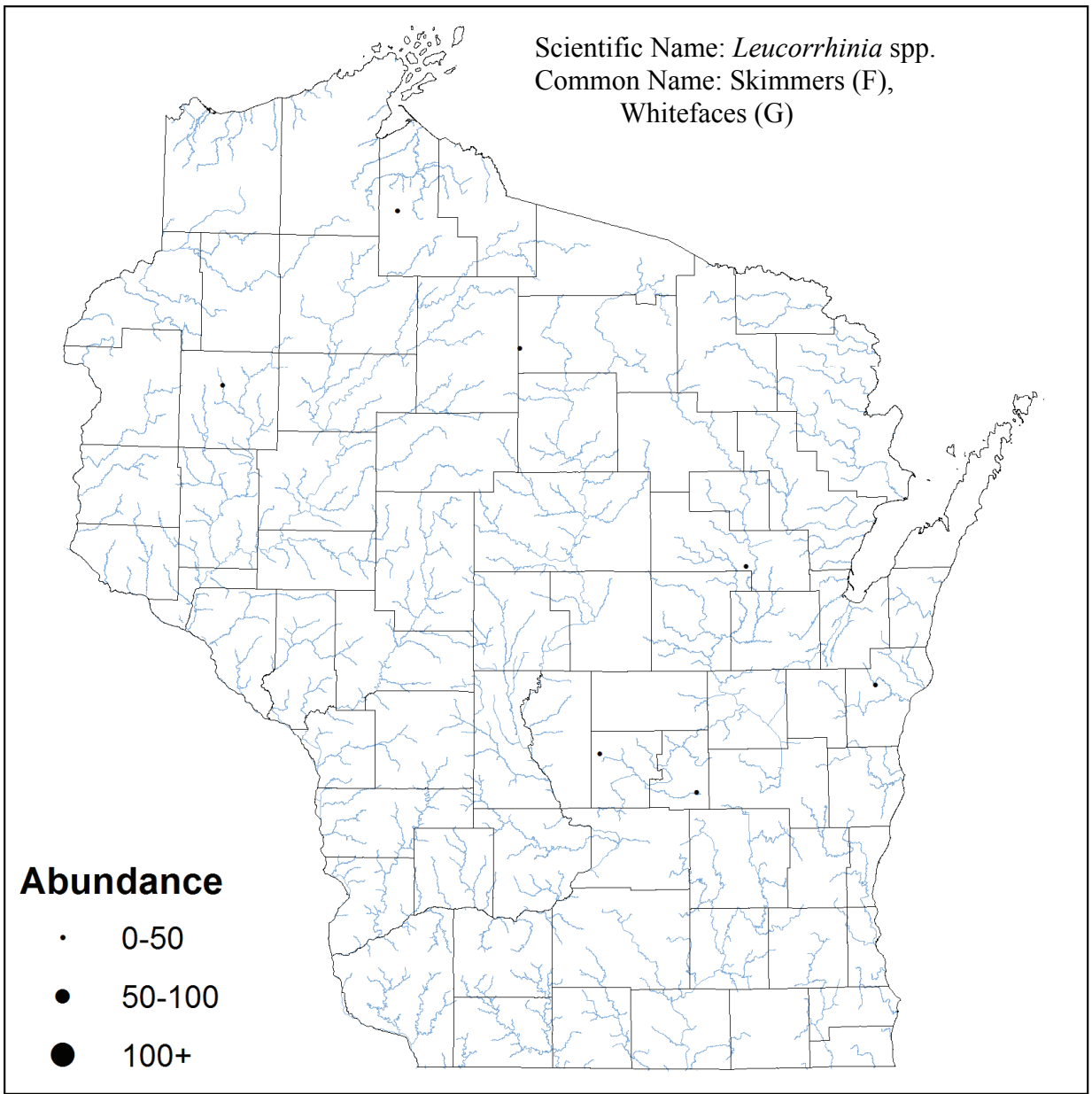


# Odonata Gomphidae

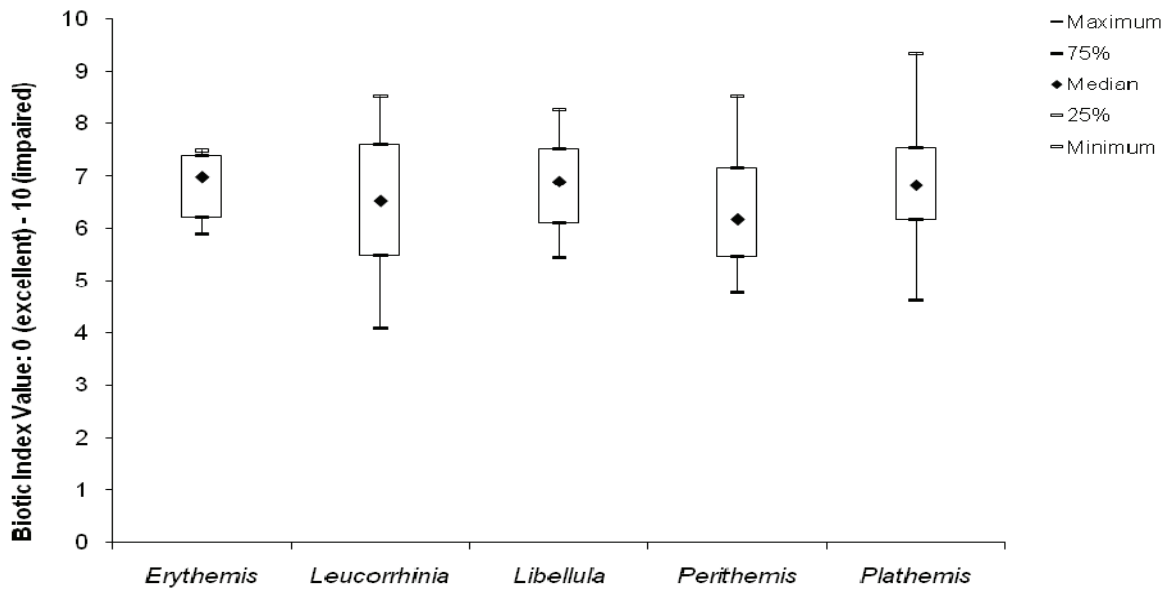
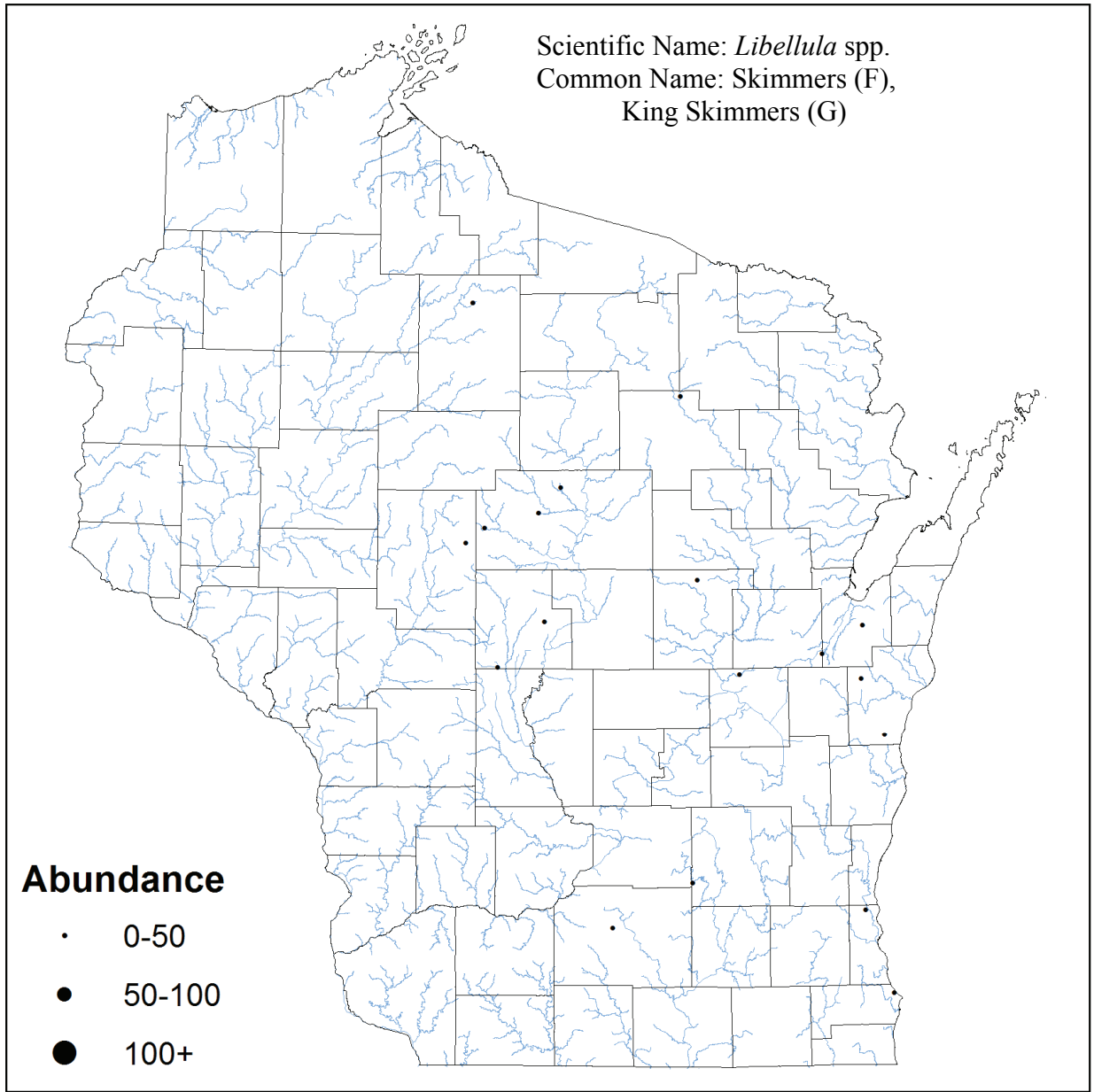


# Odonata Libellulinae

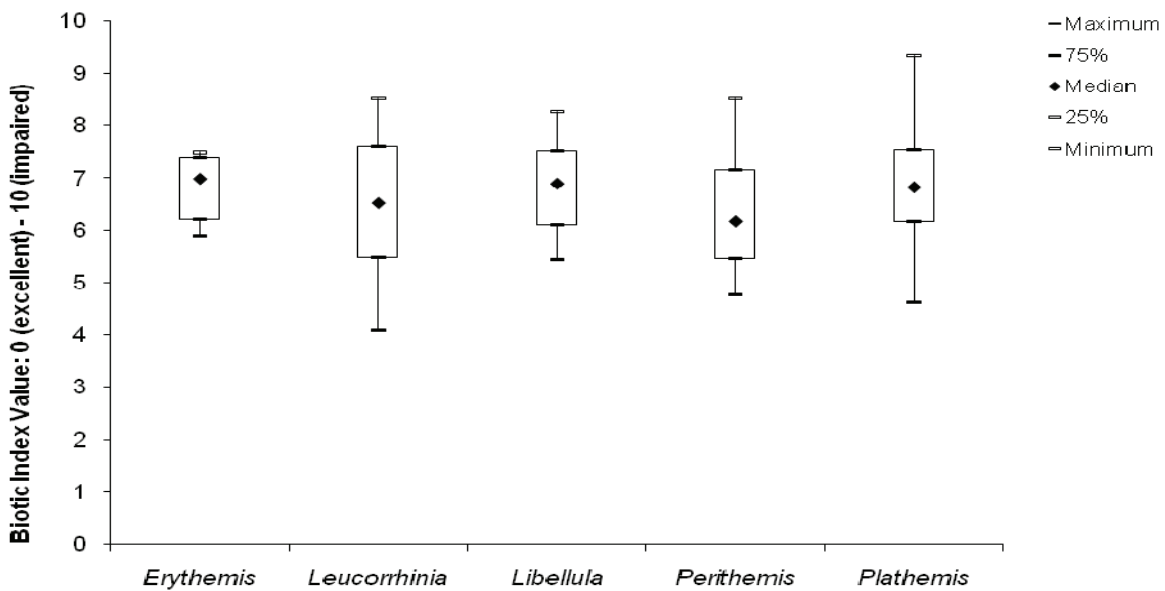
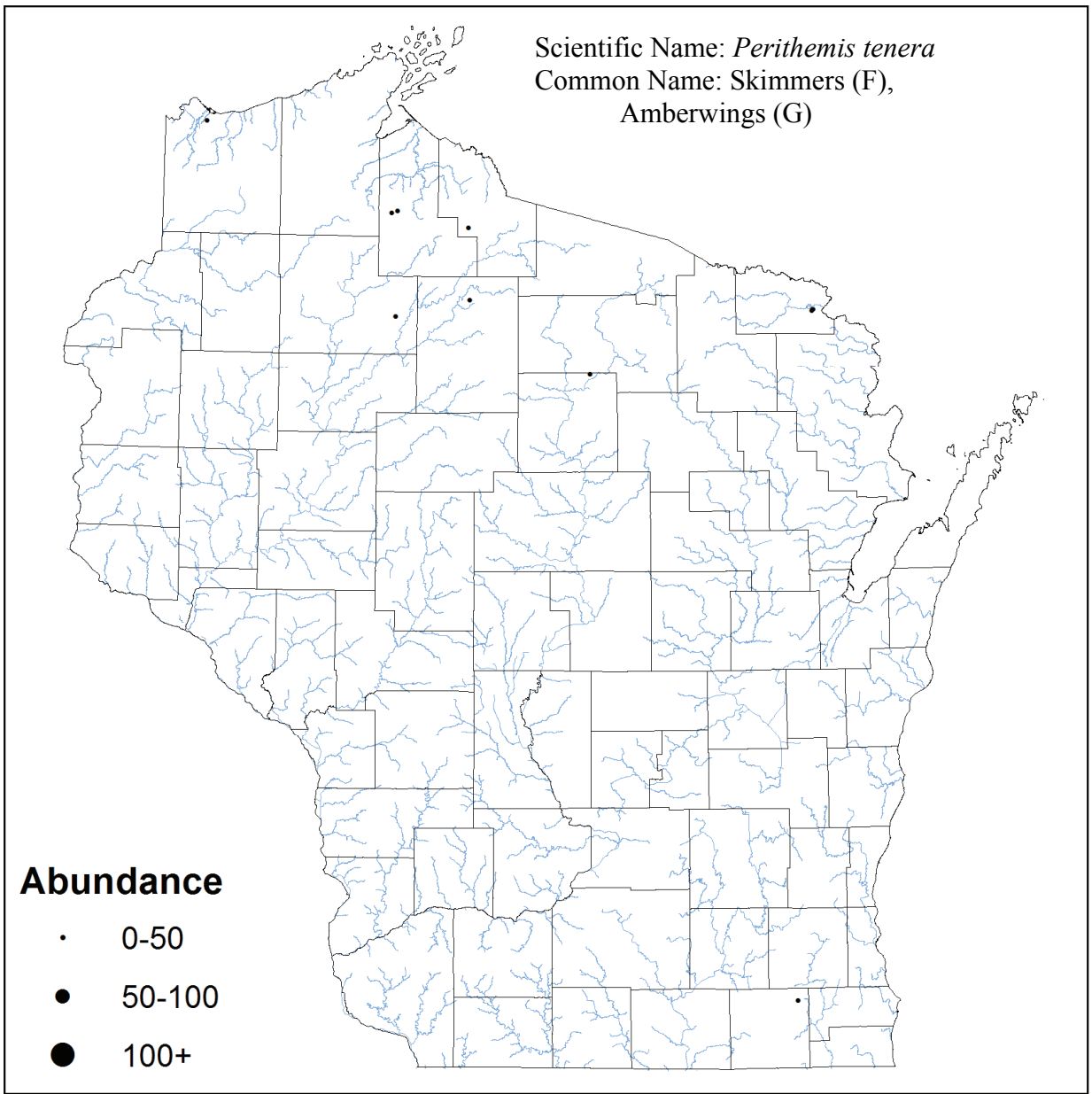




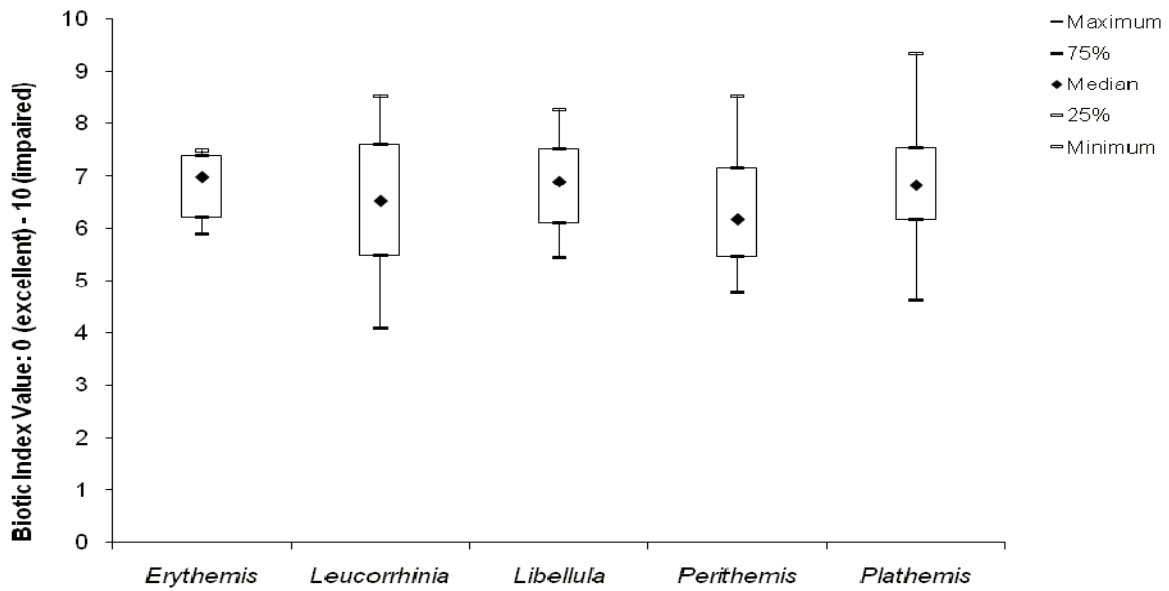
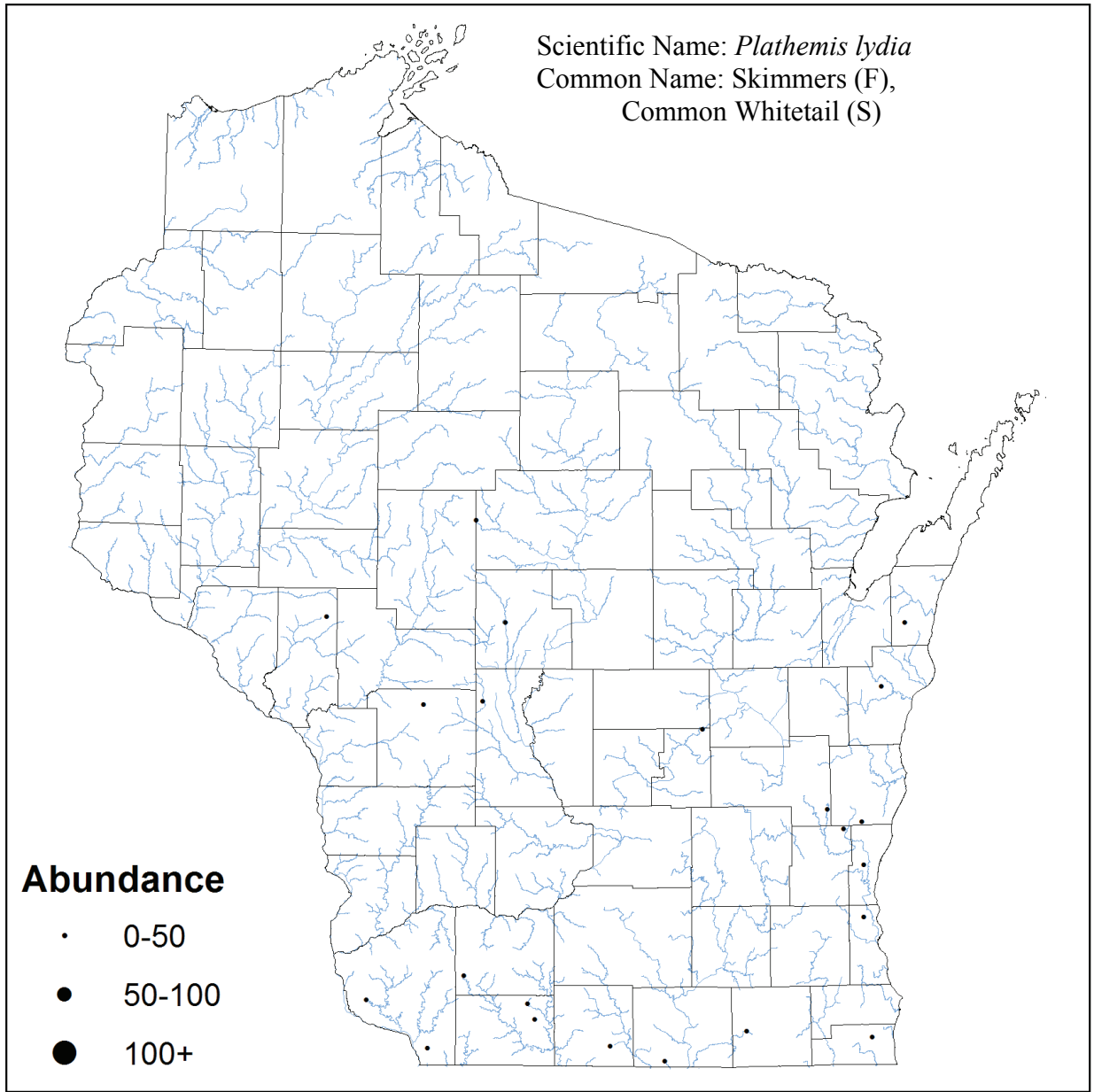
# Odonata Libellulinae

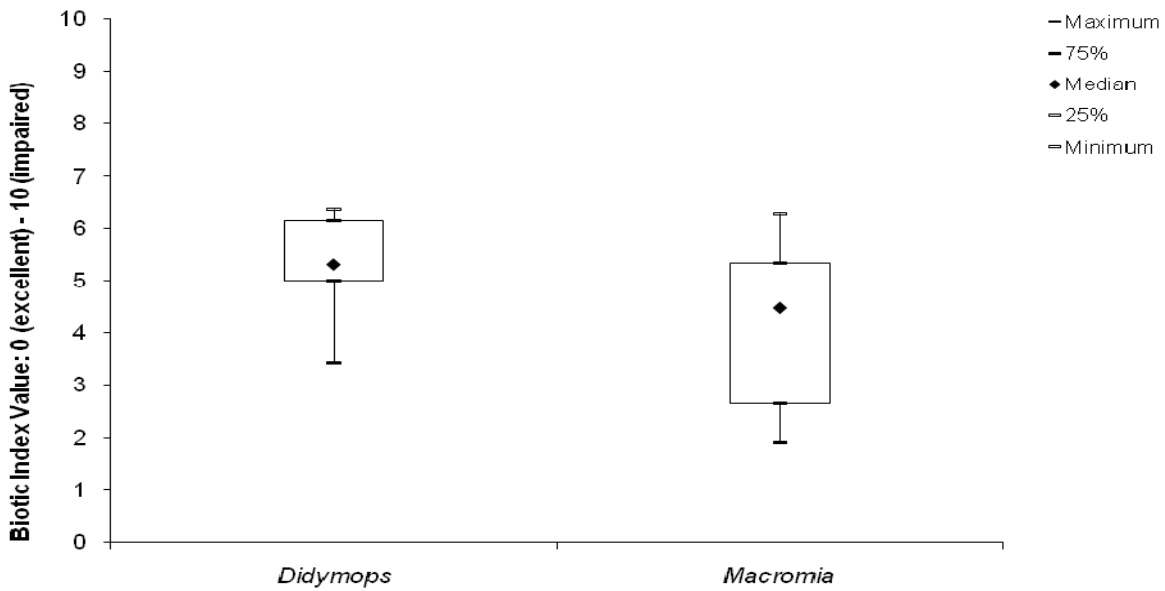
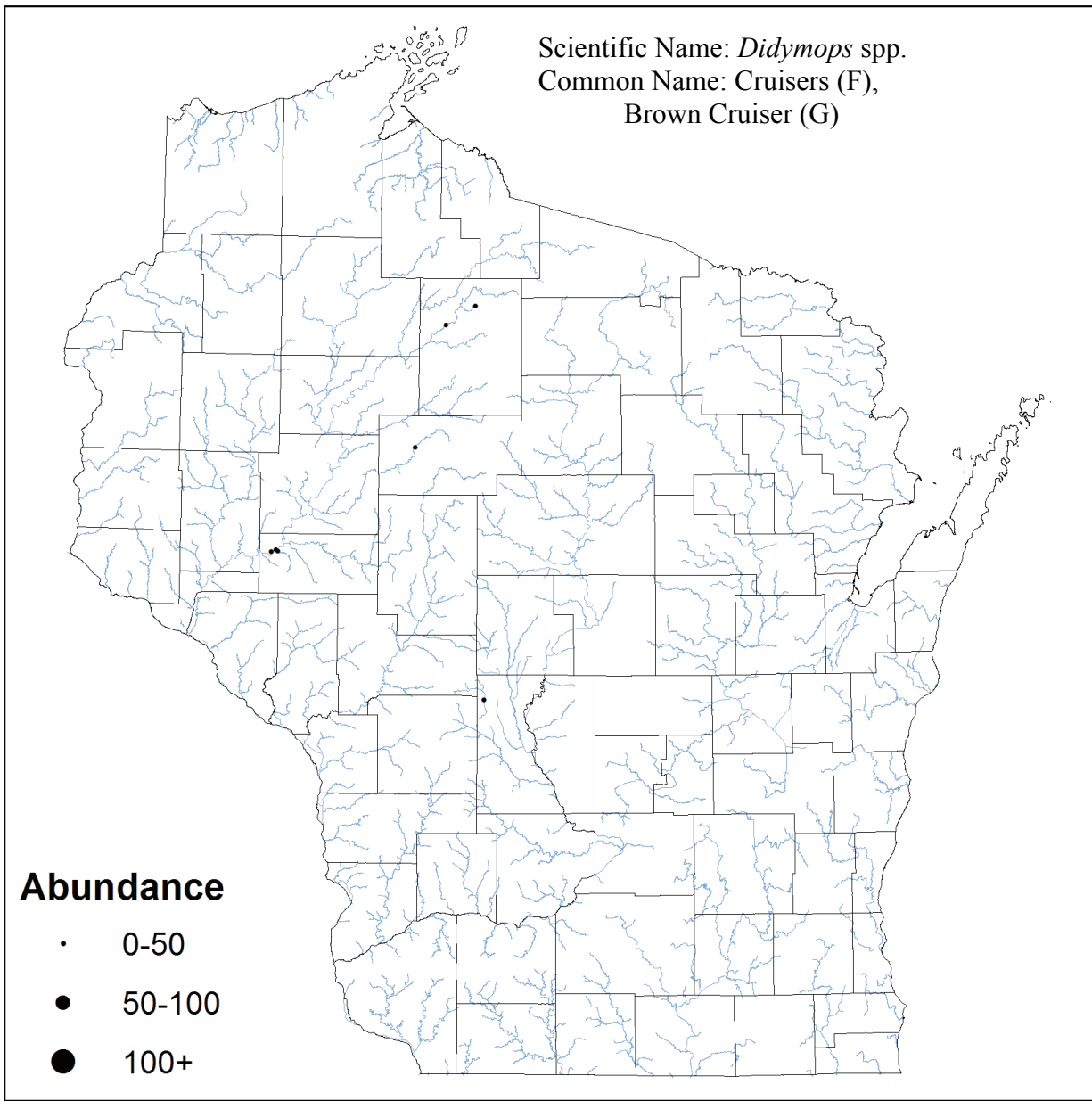




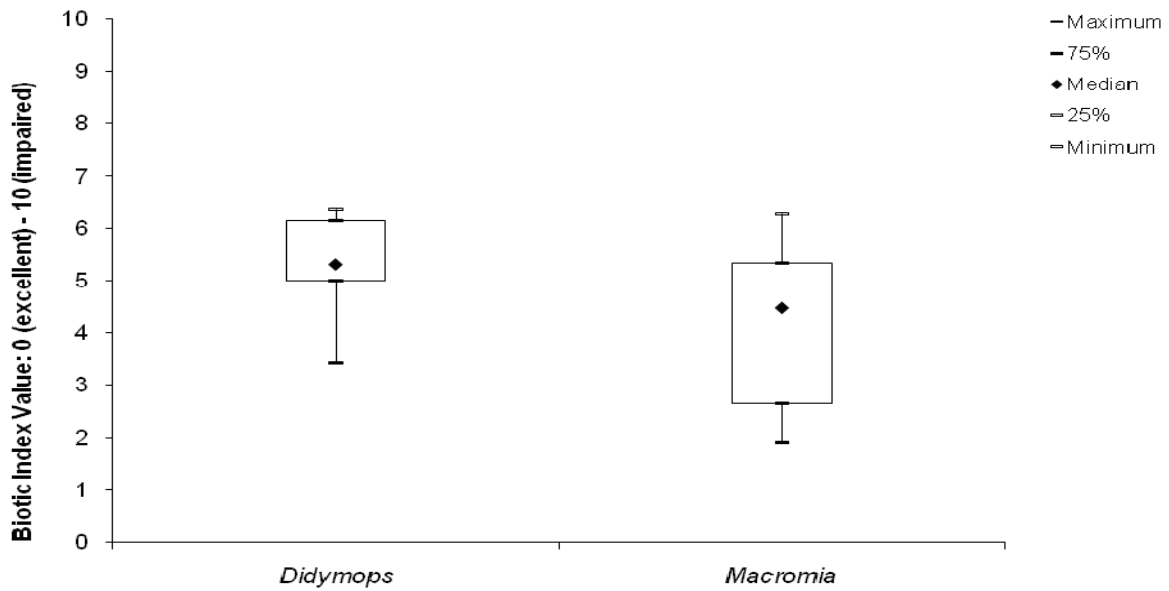
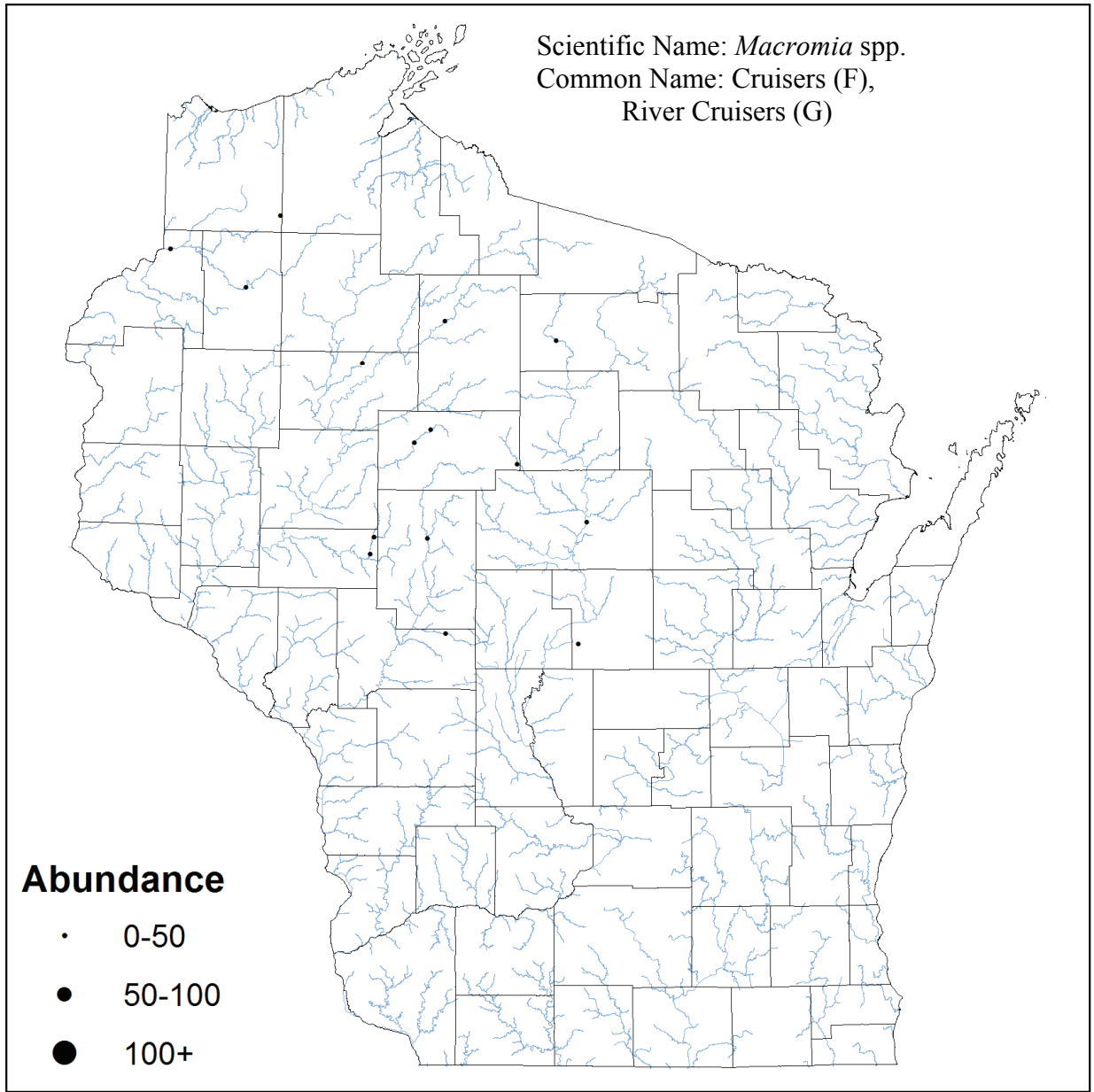


# Odonata Libellulinae

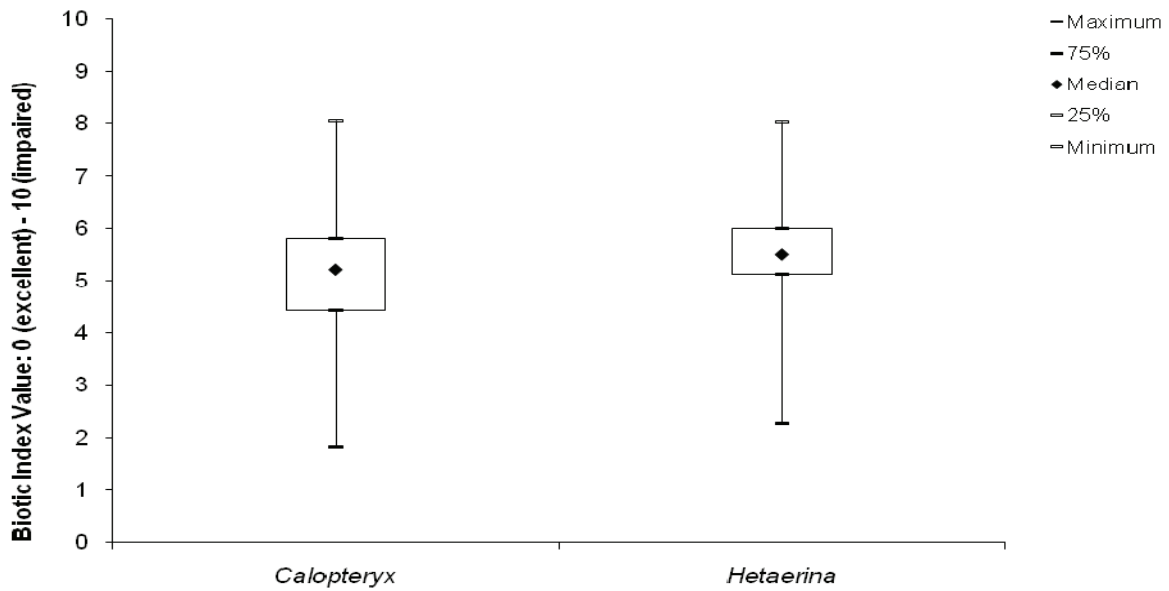
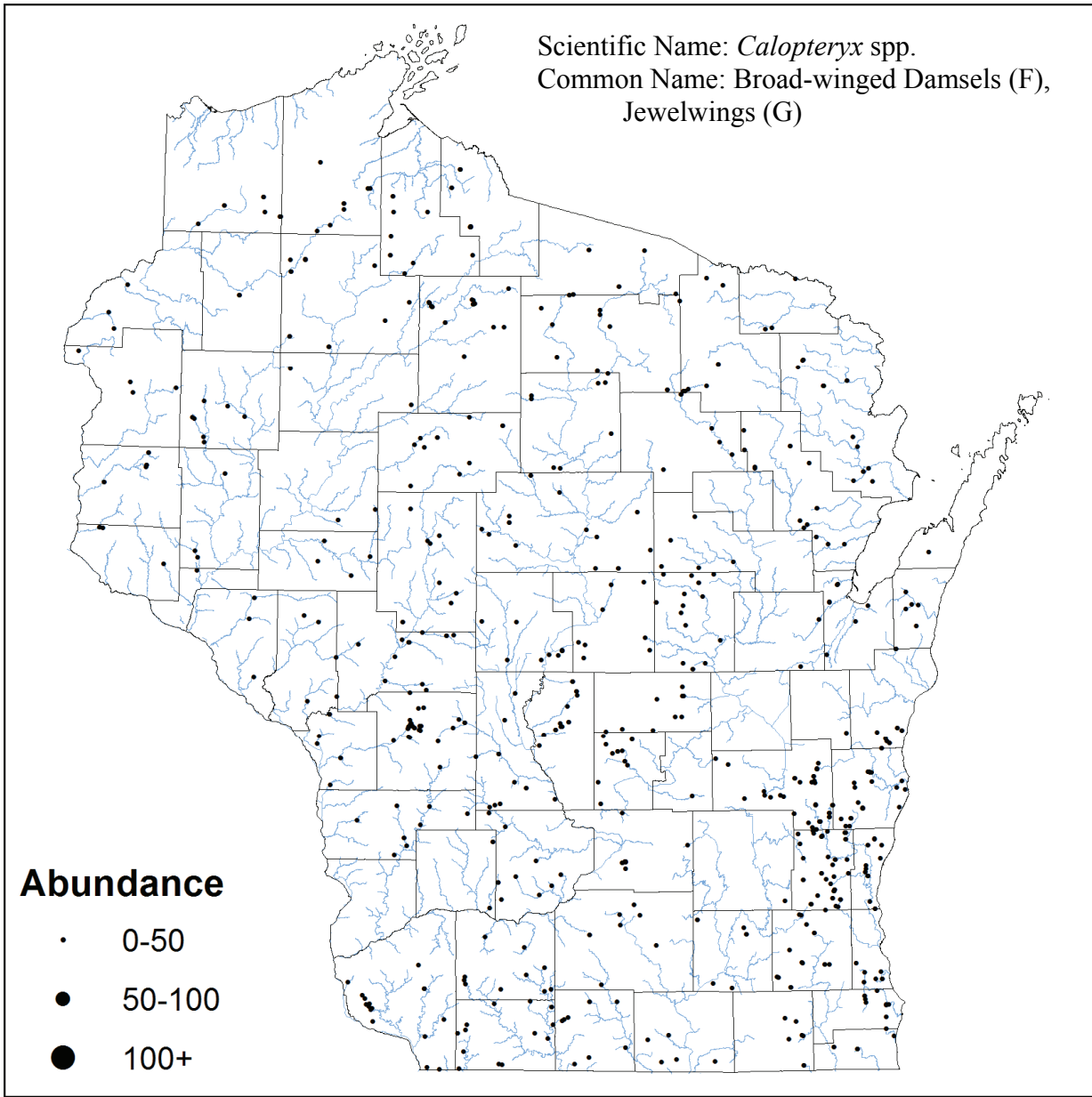




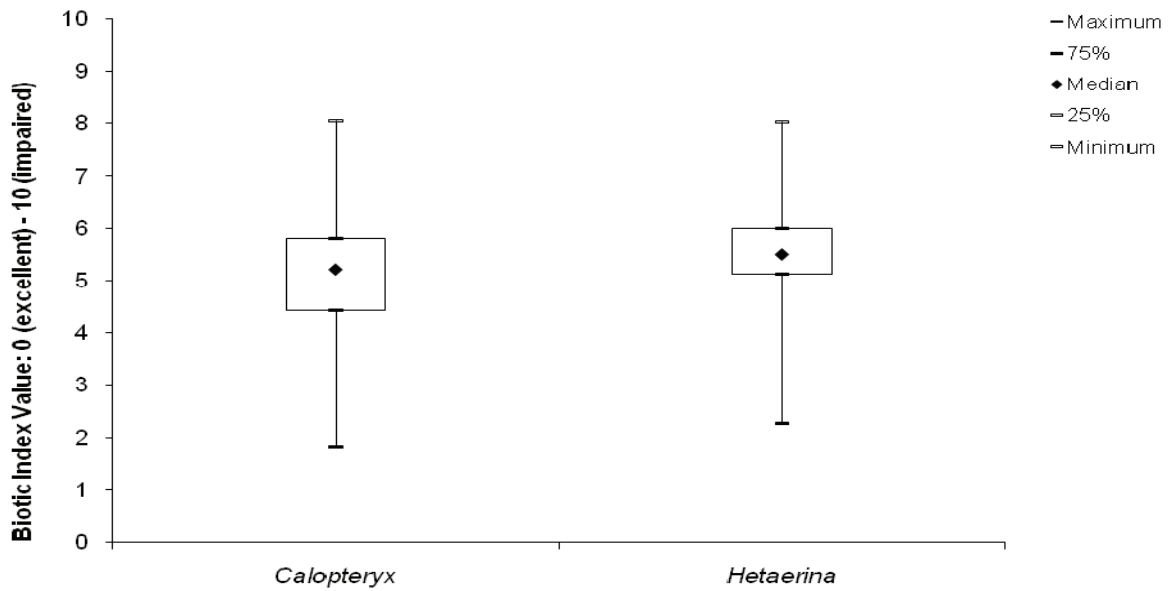
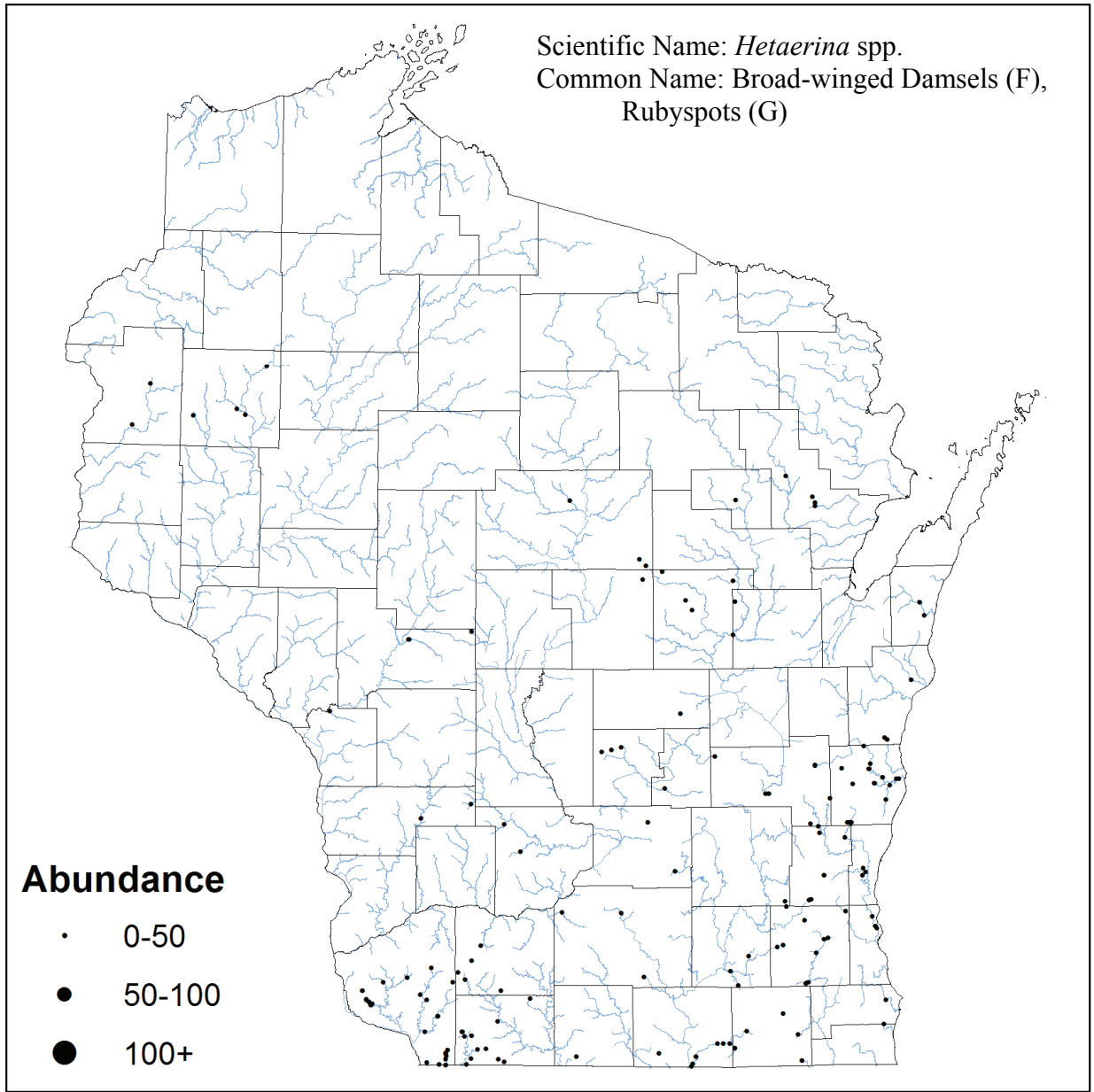
# Odonata Macromiinae



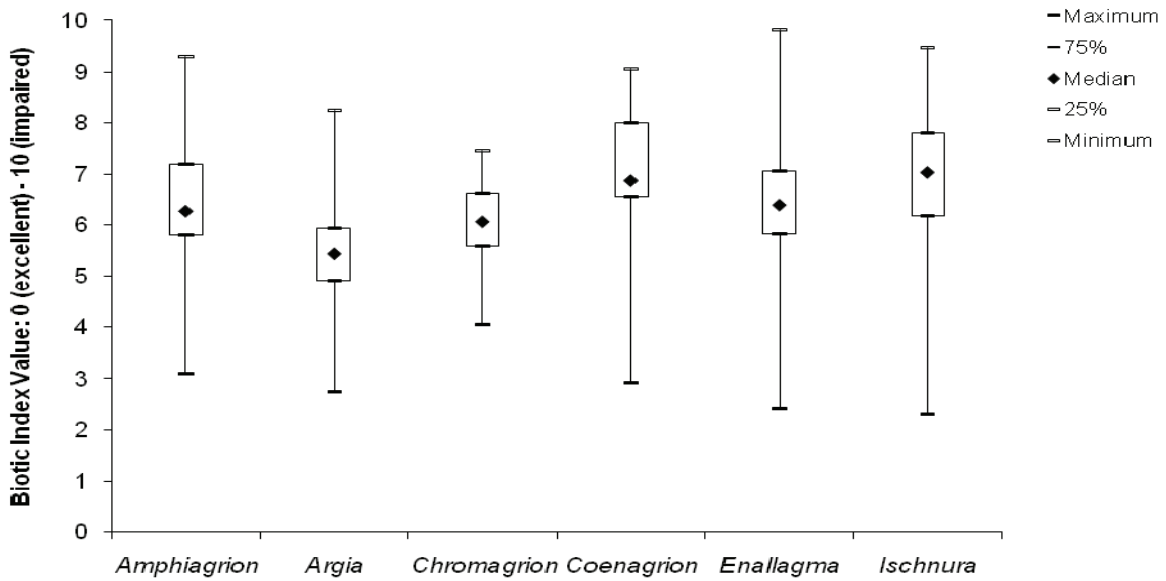
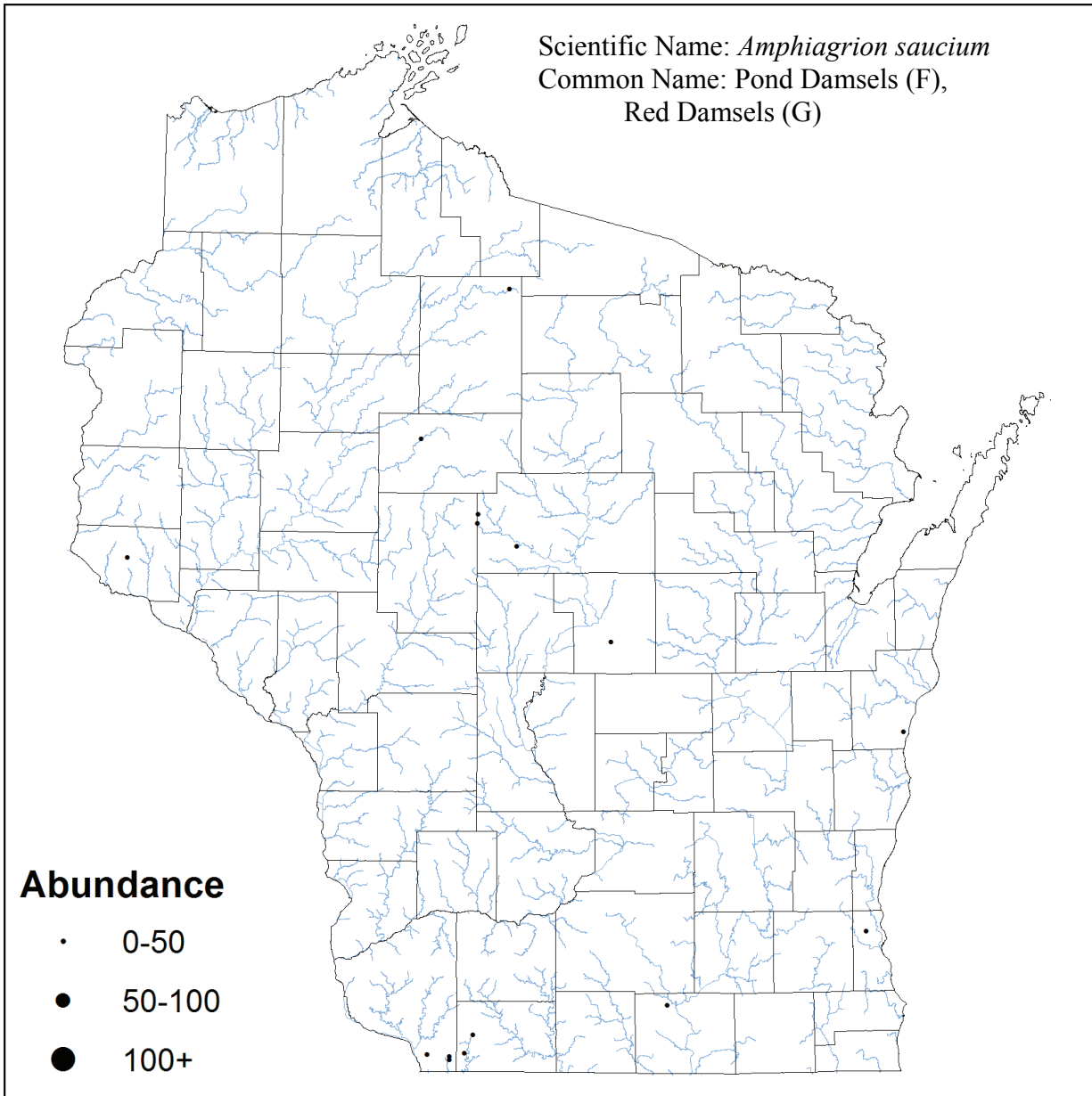
Odonata Calopterygidae



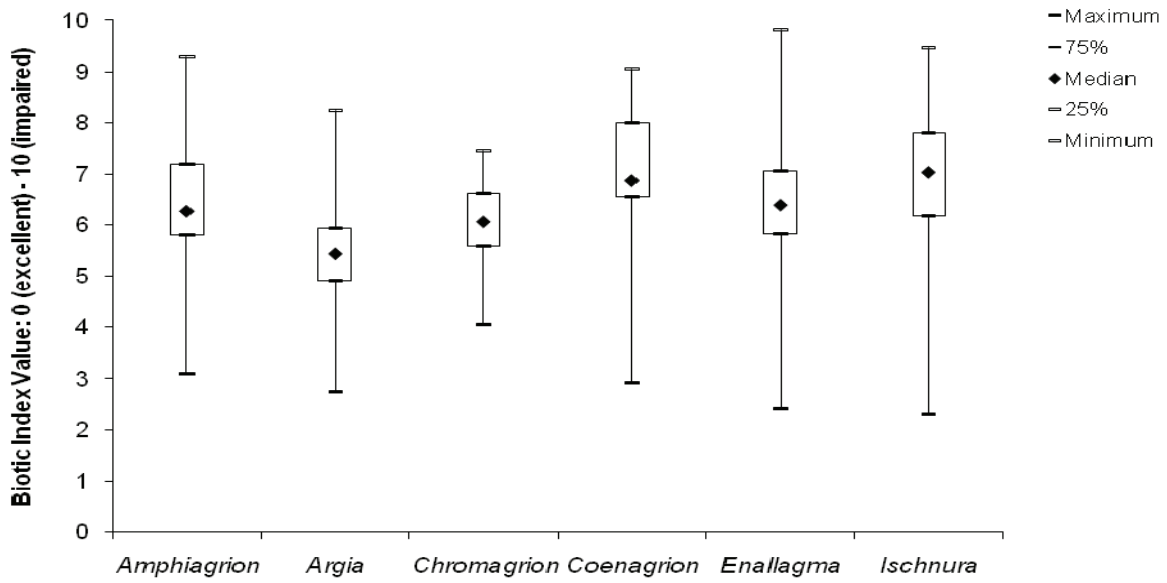
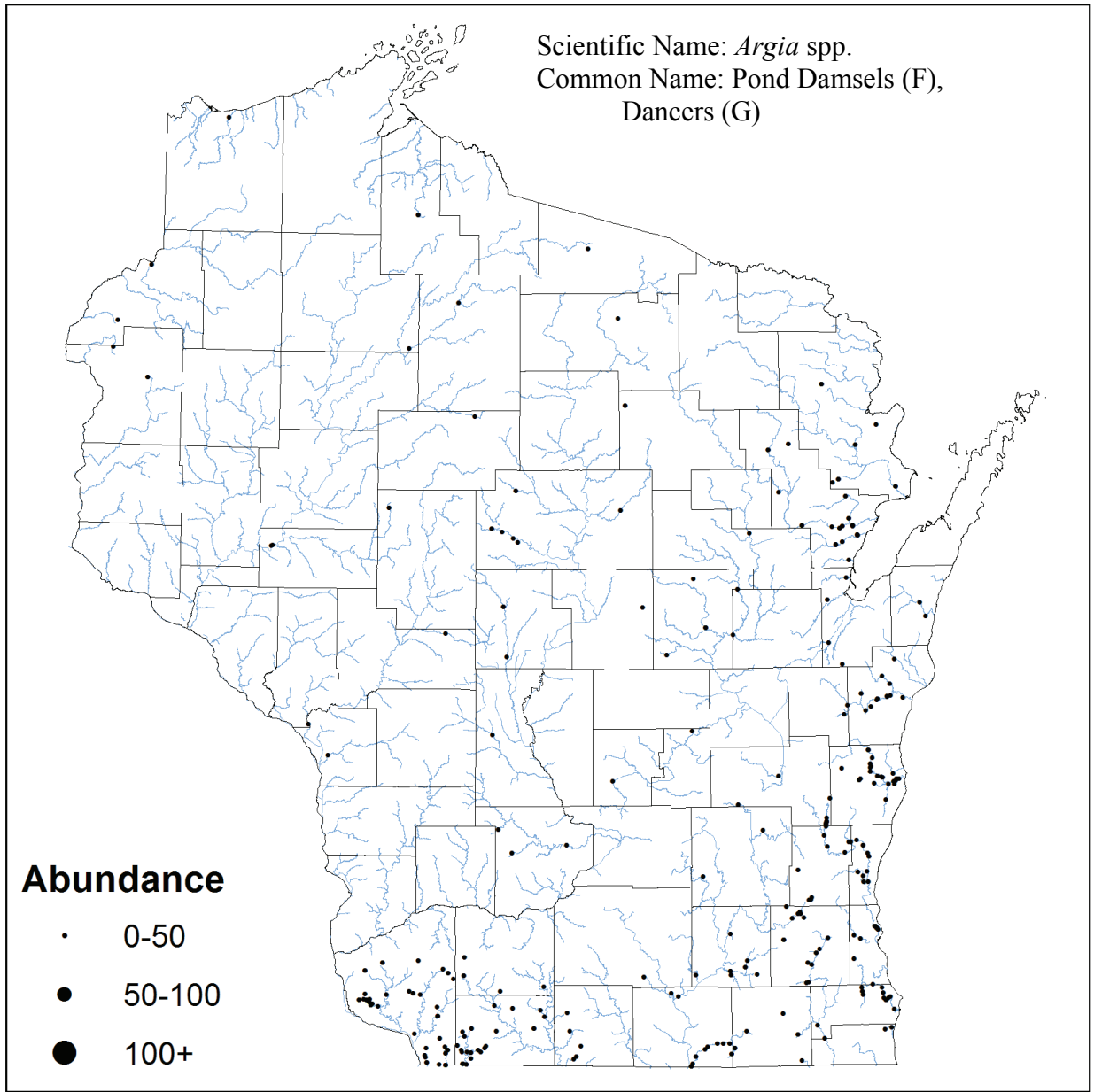
# Odonata Calopterygidae



# Odonata Coenagrionidae

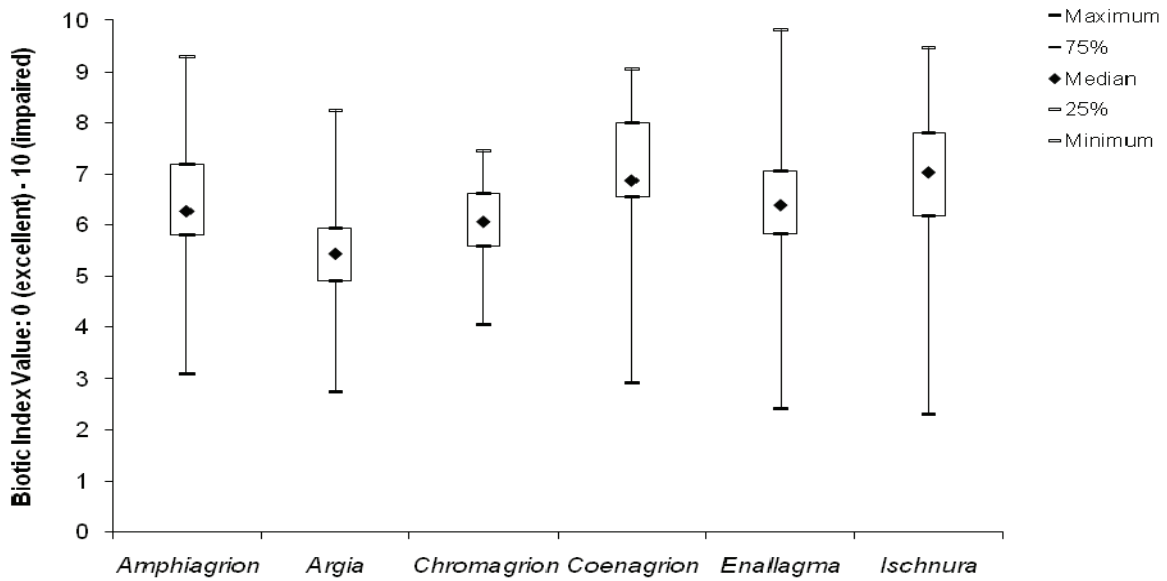
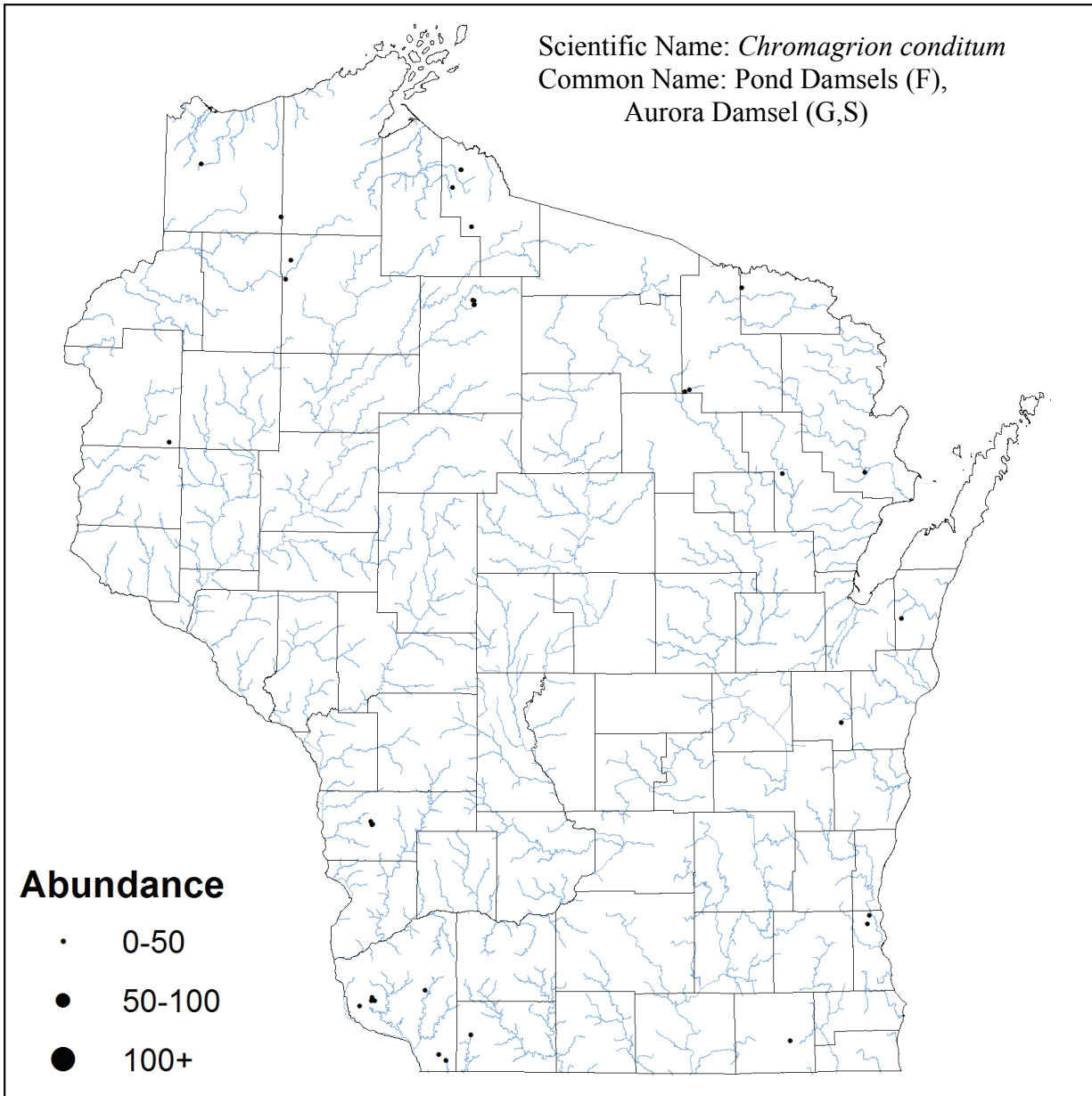


# Odonata Coenagrionidae

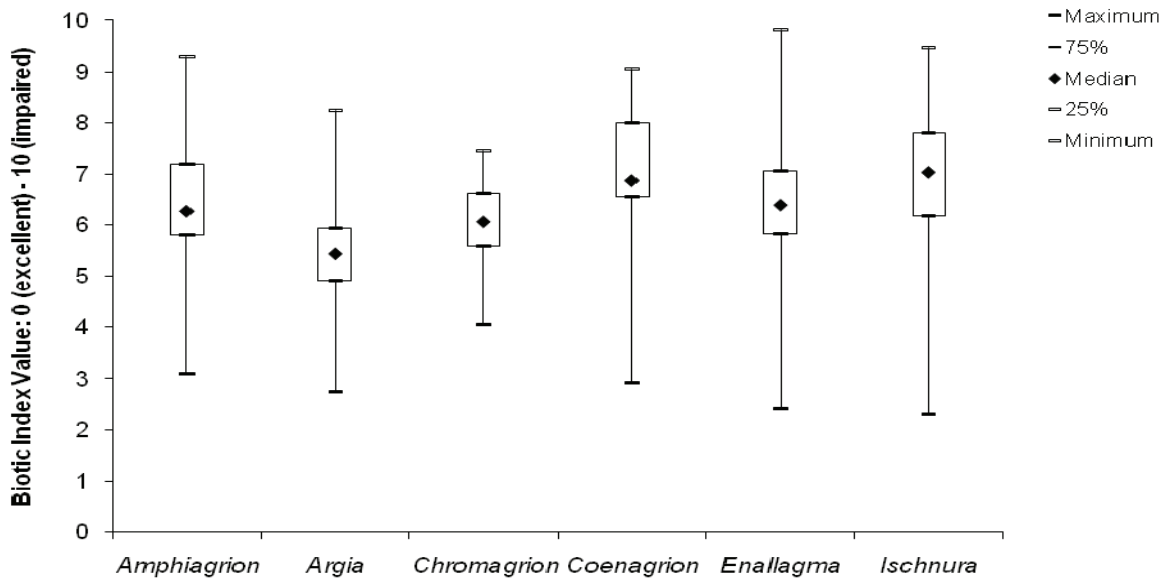
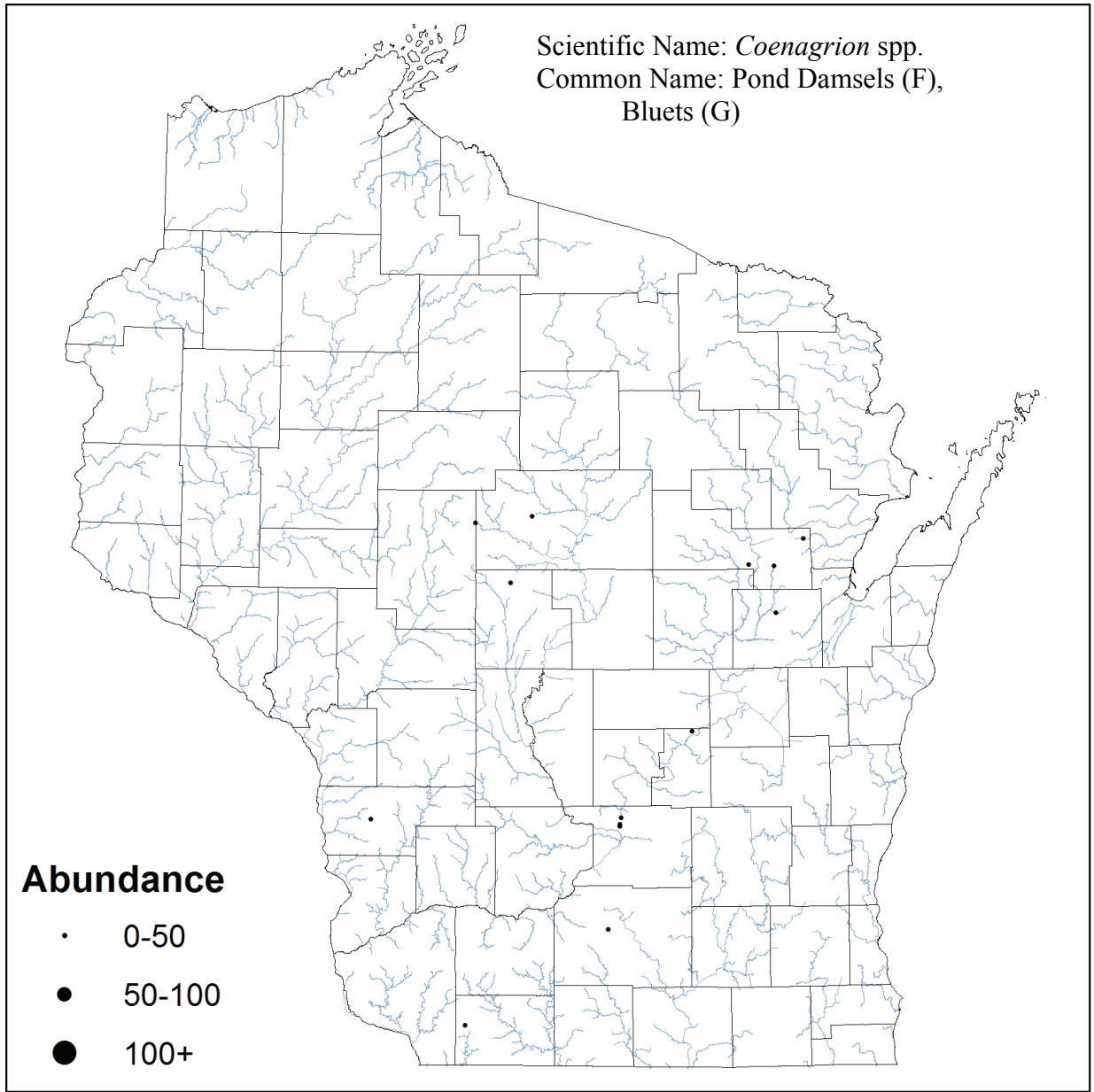




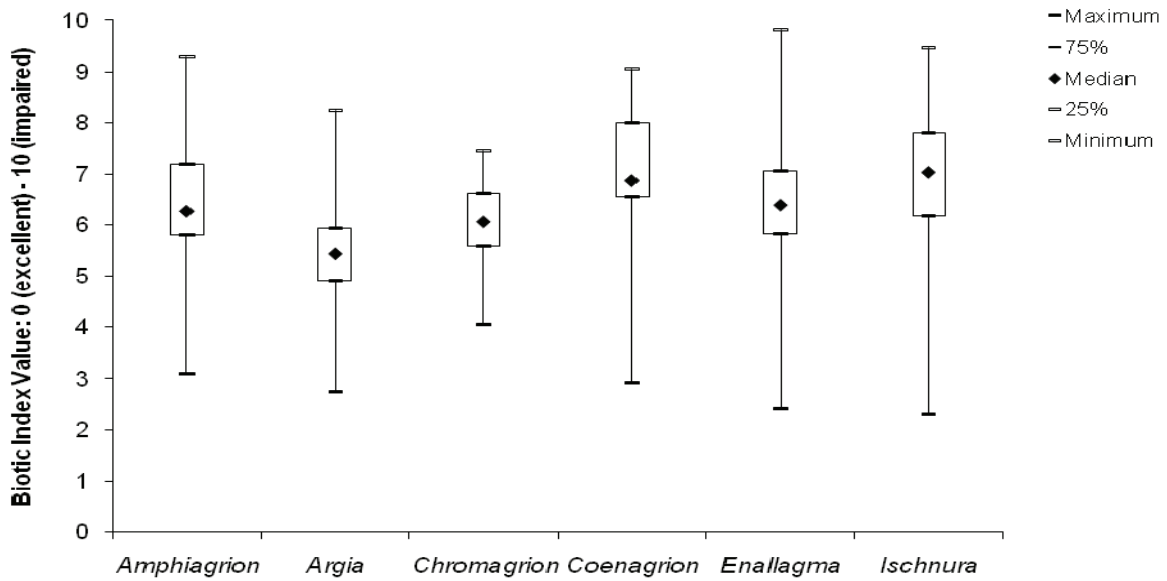
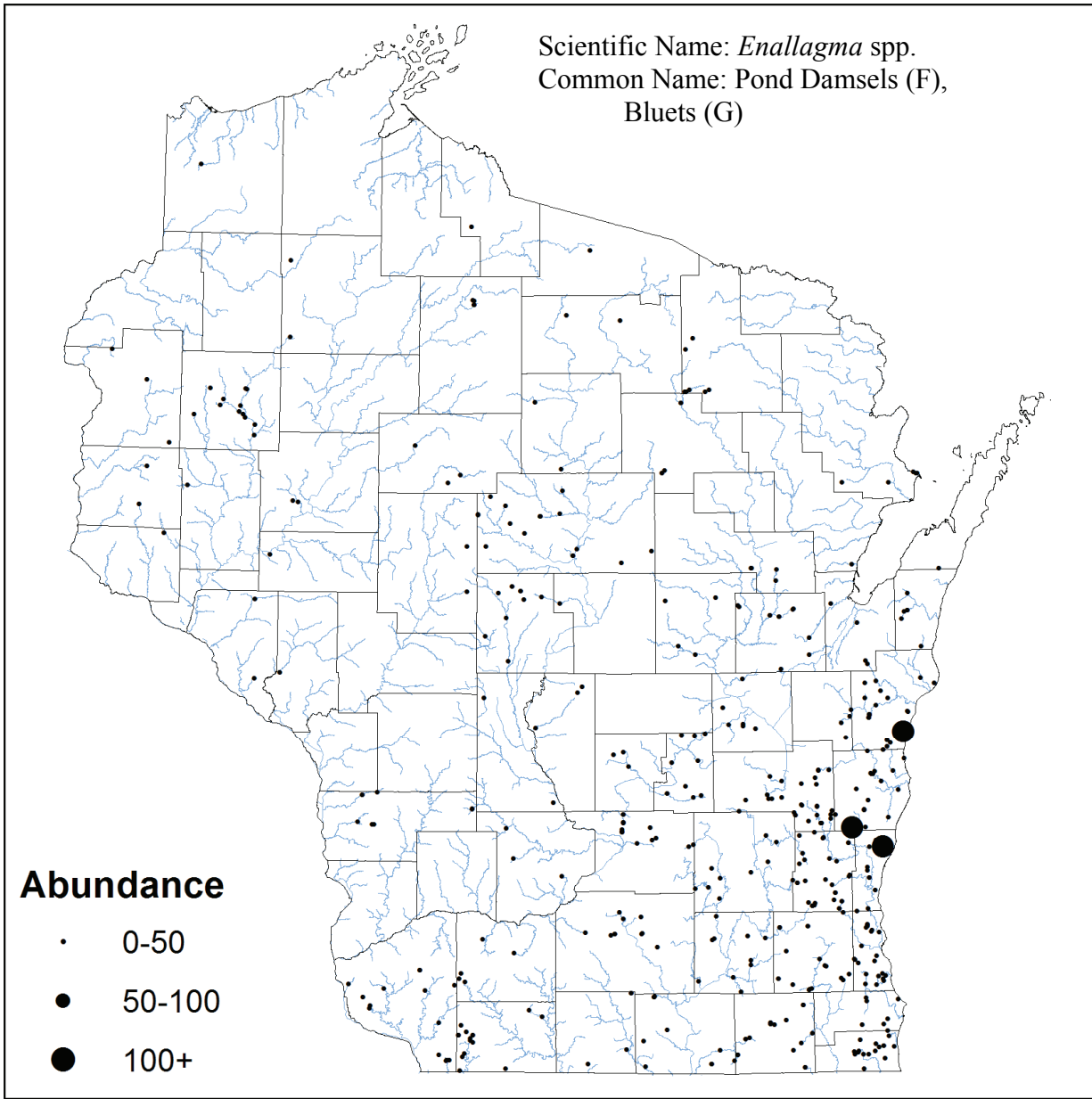
# Odonata Coenagrionidae



# Odonata Coenagrionidae



# Odonata Coenagrionidae

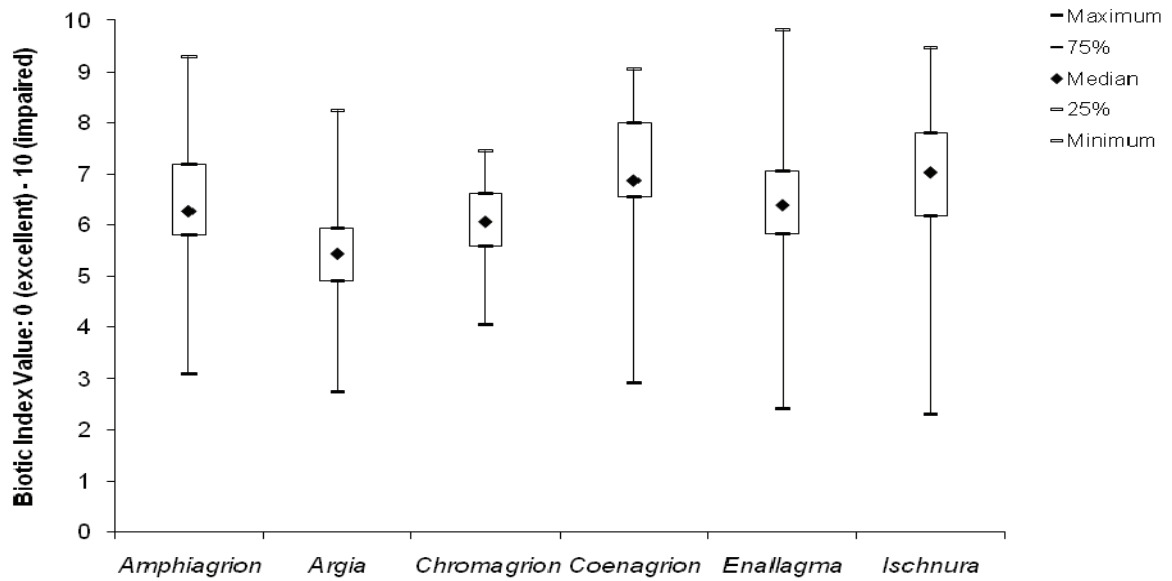
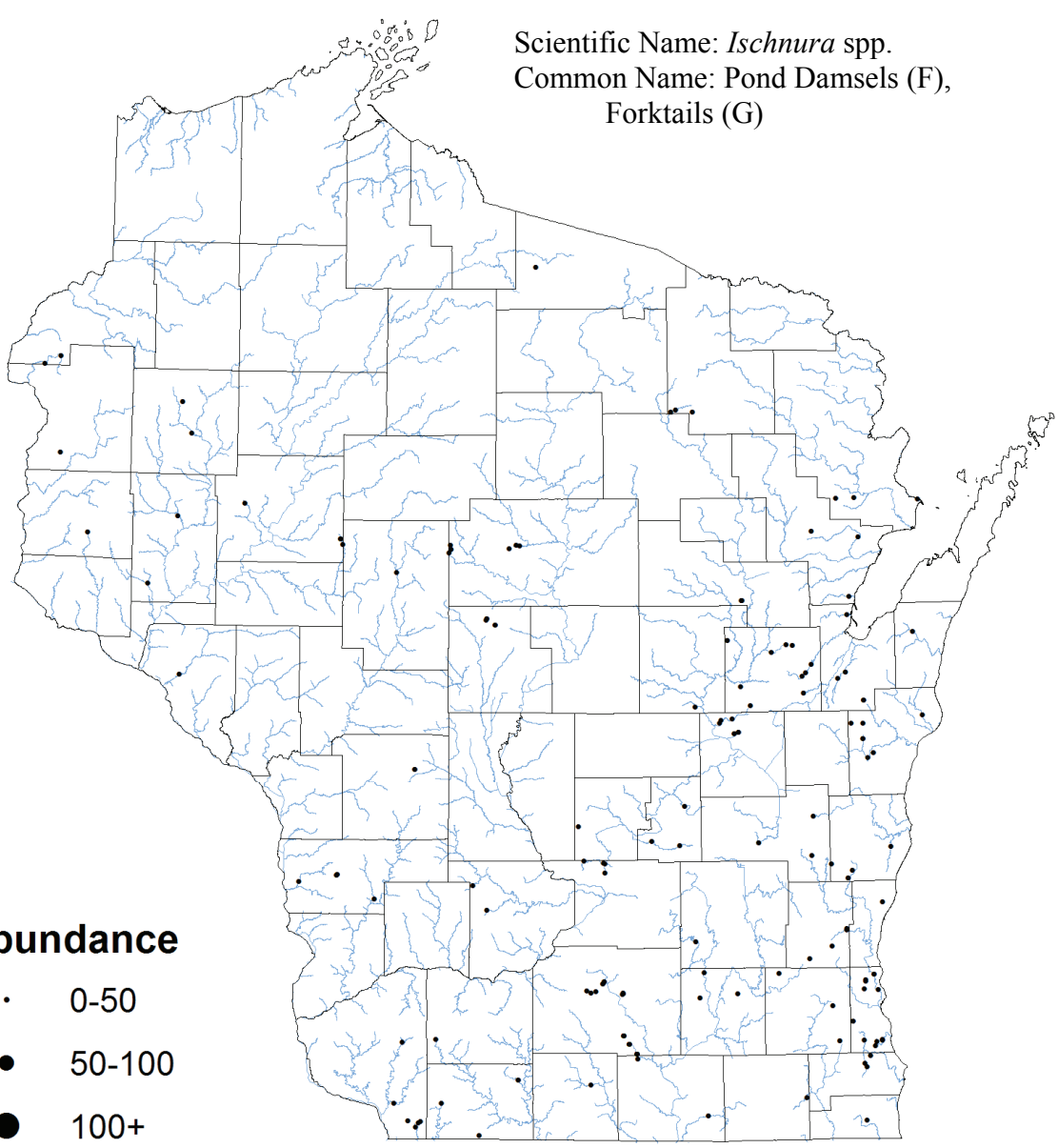


# Odonata Coenagrionidae

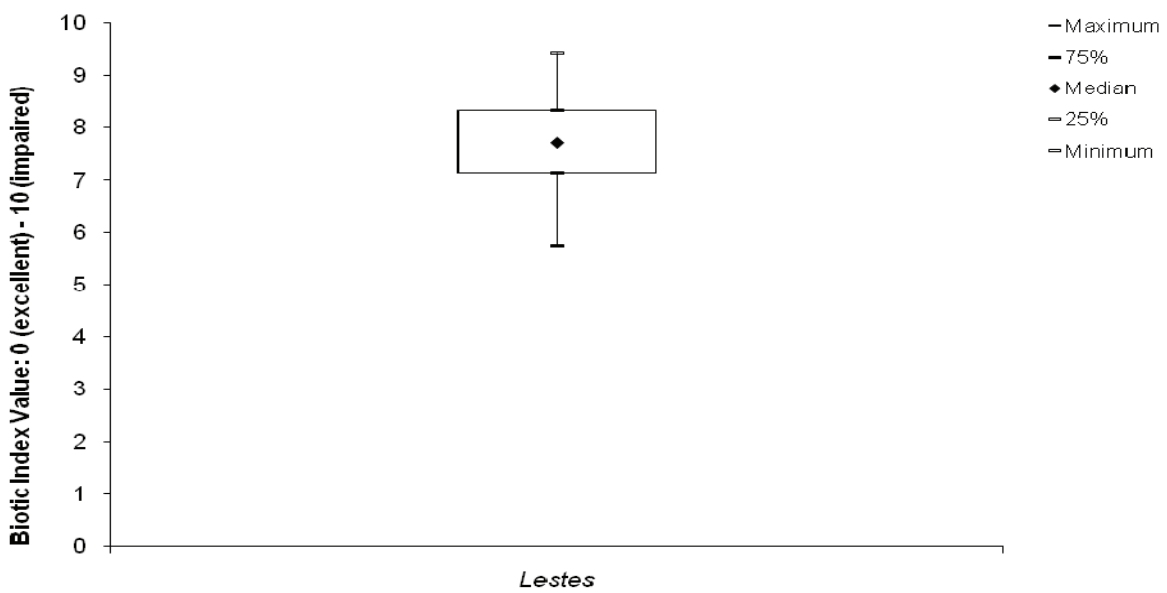
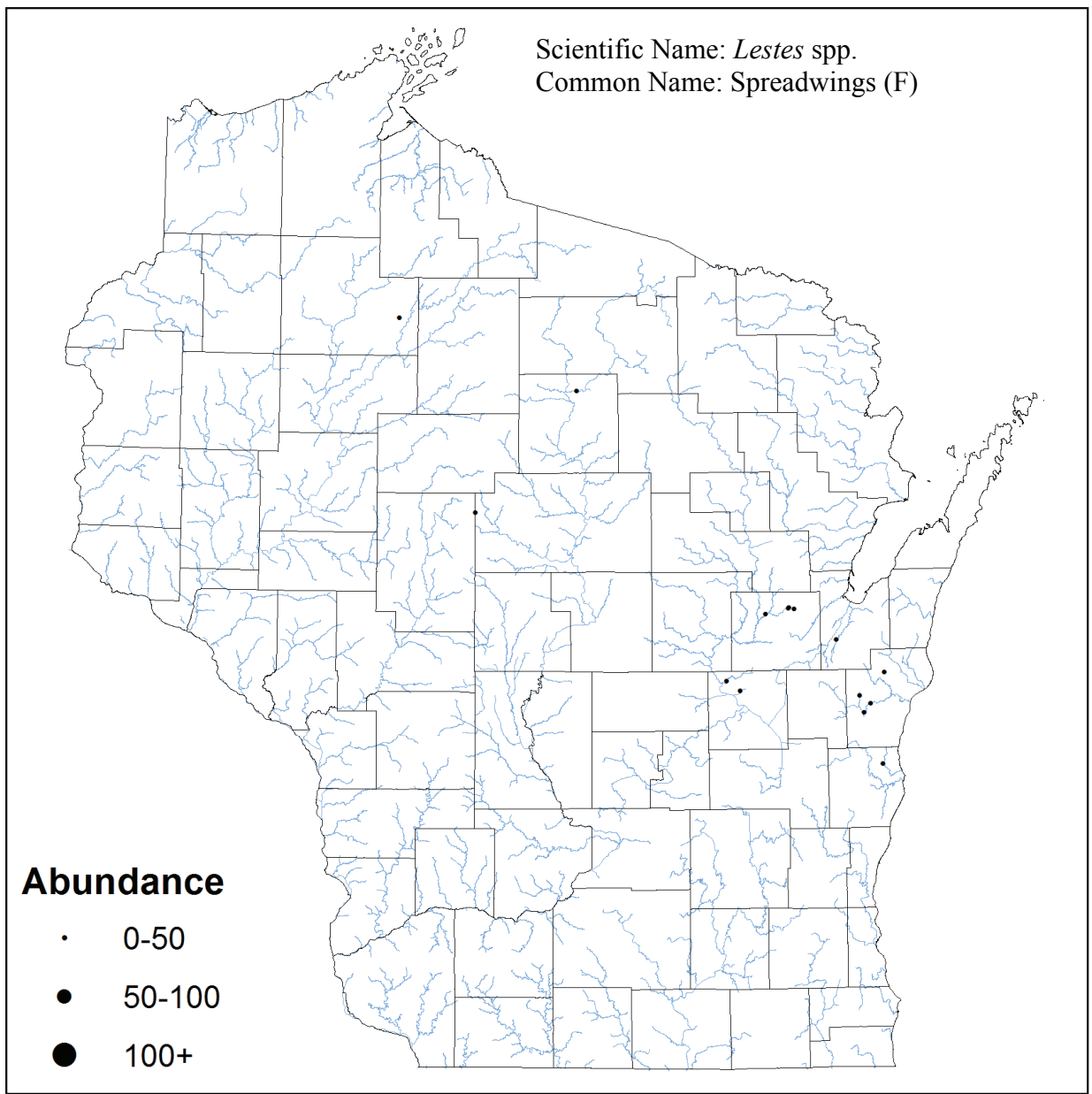
Scientific Name: *Ischnura* spp.  
 Common Name: Pond Damsels (F),  
 Forktails (G)

## Abundance

- 0-50
- 50-100
- 100+



# Odonata Lestidae





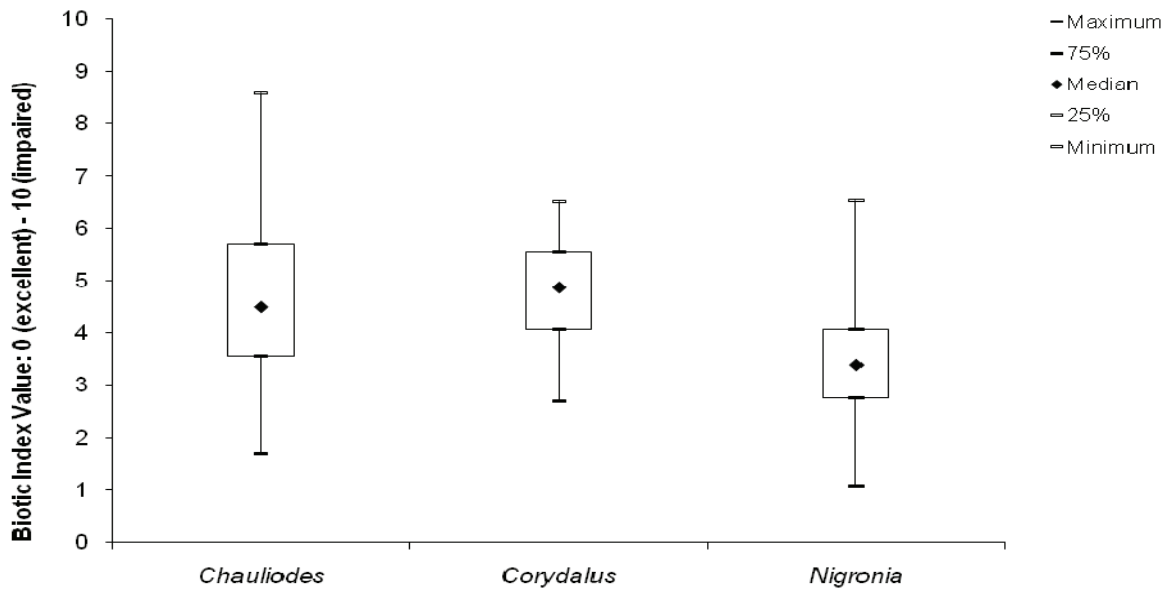
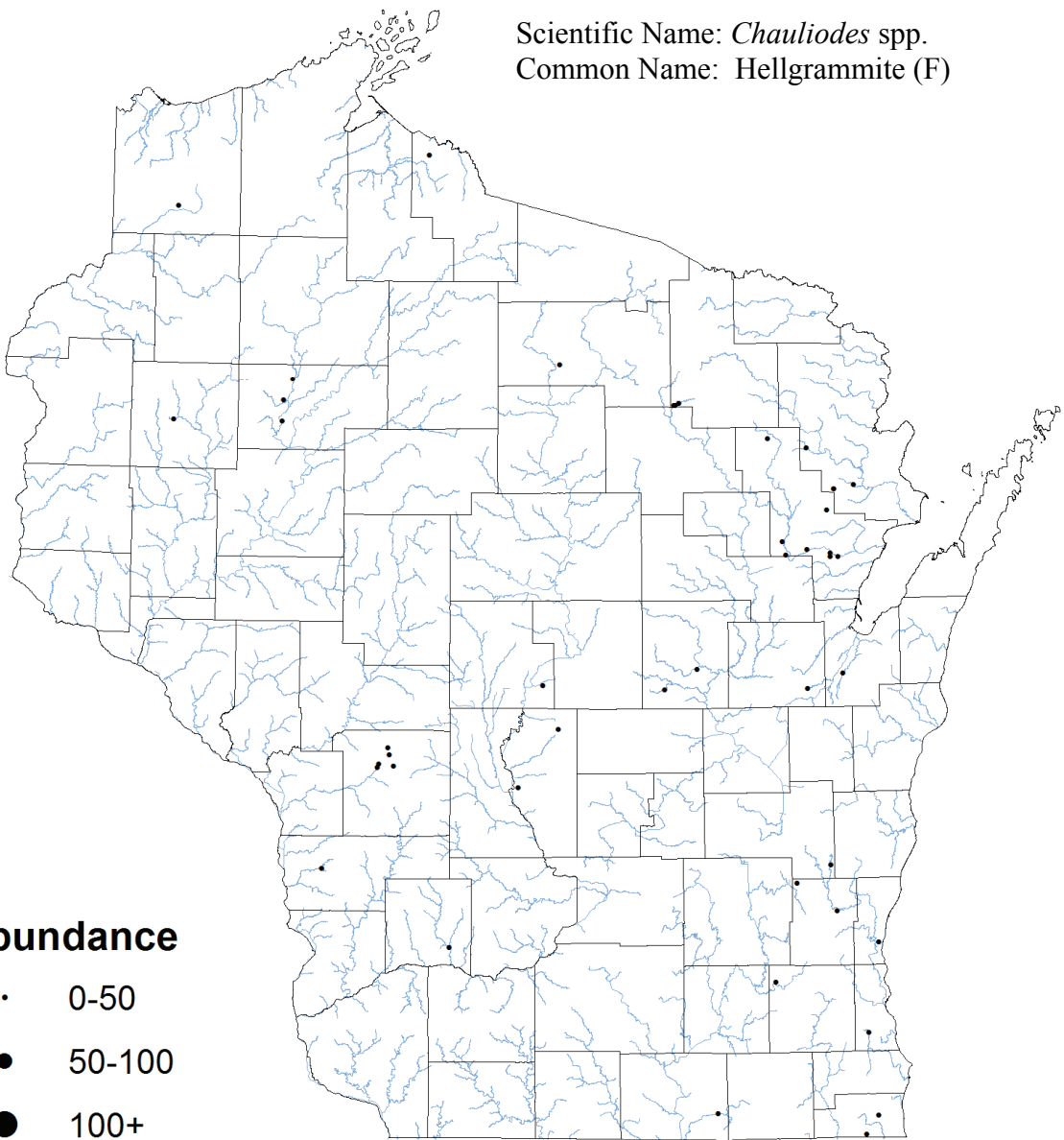
## Section V: Megaloptera (Dobsonflies)

# Megaloptera Corydalidae

Scientific Name: *Chauliodes* spp.  
 Common Name: Hellgrammite (F)

## Abundance

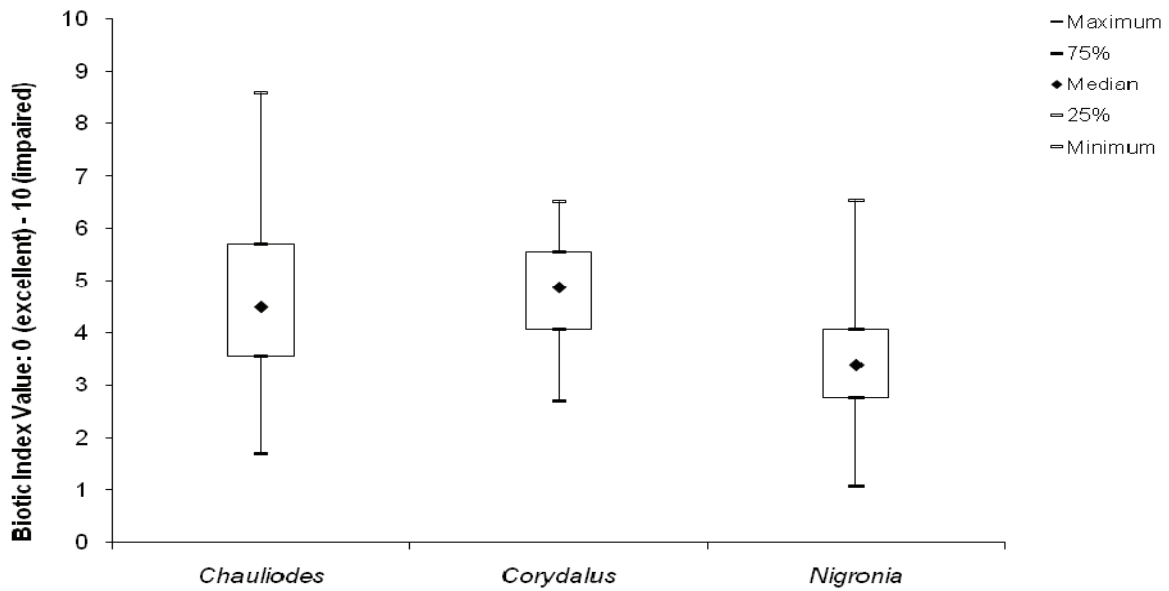
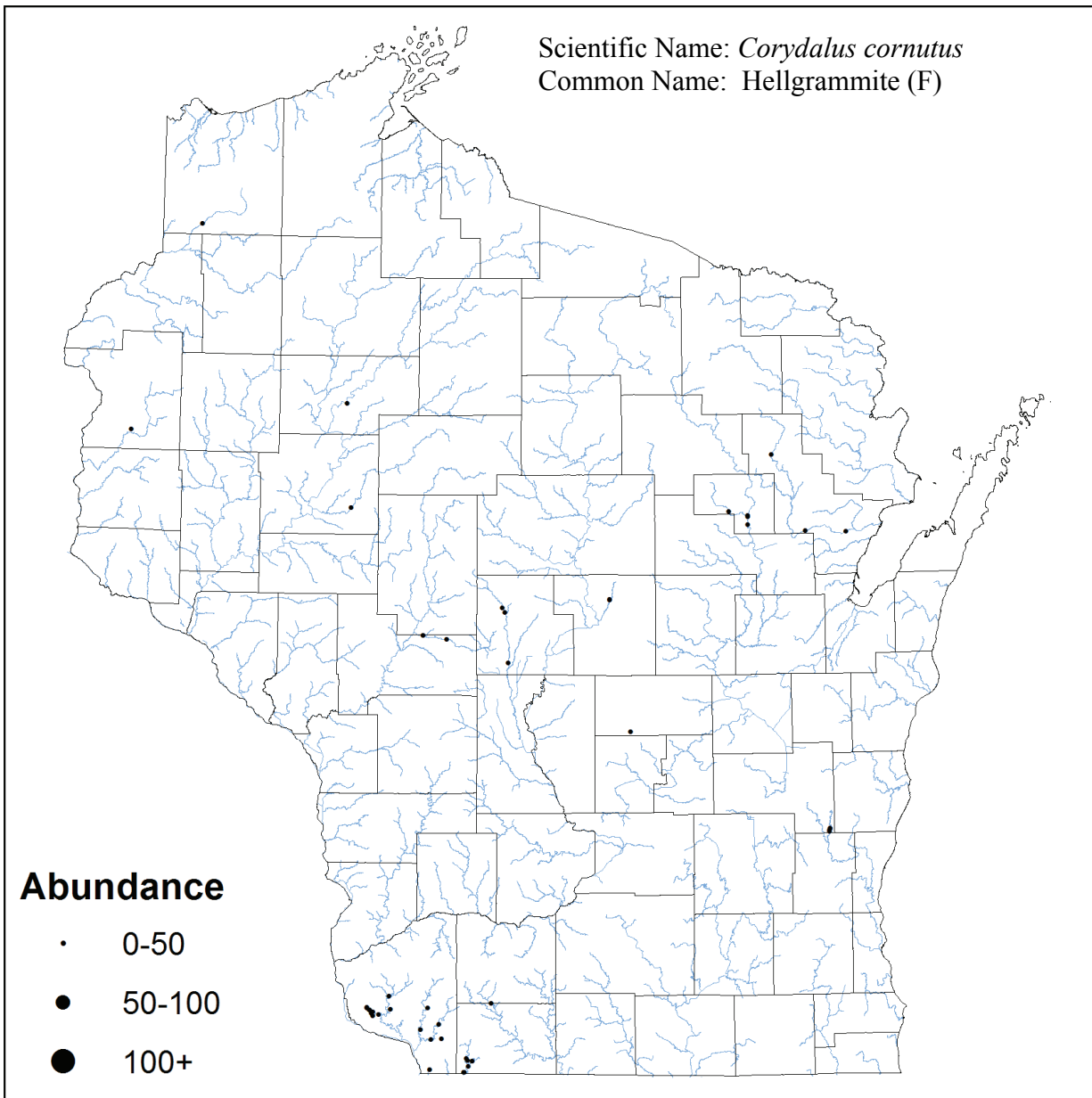
- 0-50
- 50-100
- 100+





# Megaloptera Corydalidae

Scientific Name: *Corydalus cornutus*  
 Common Name: Hellgrammite (F)

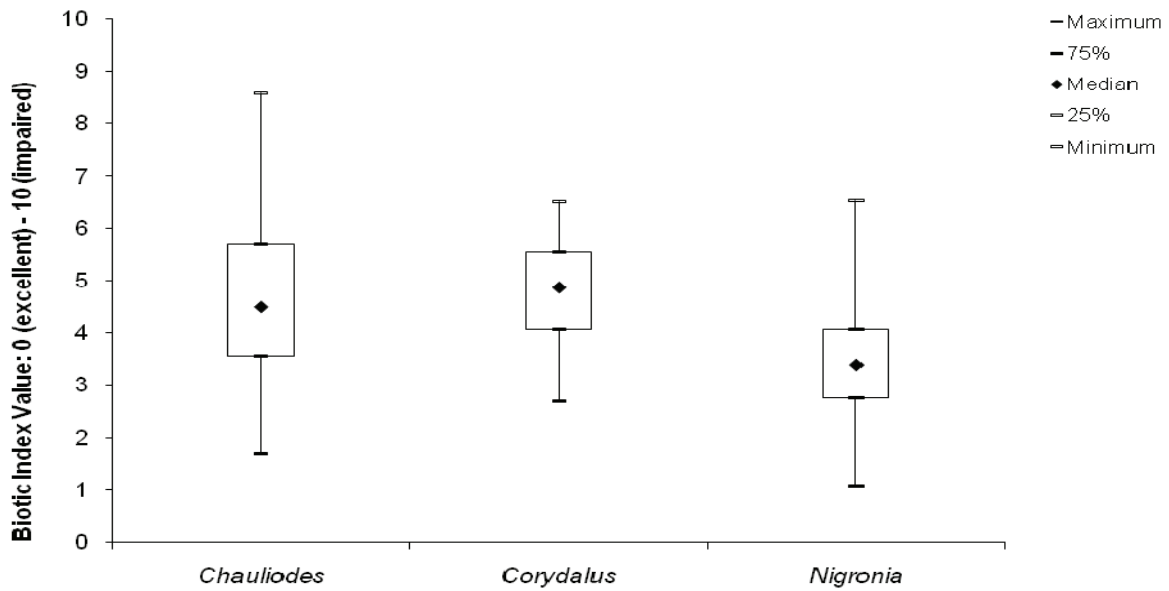
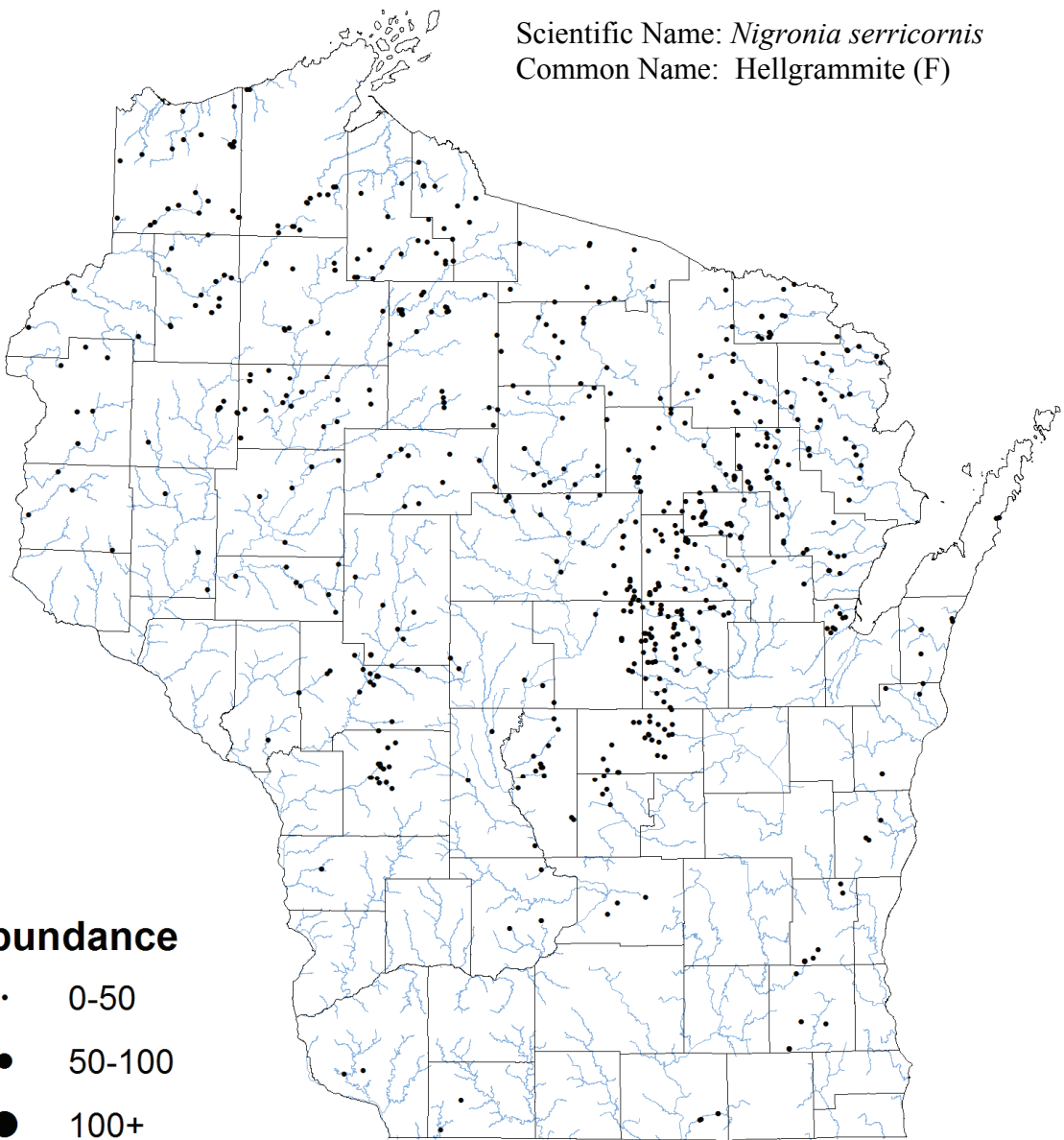


# Megaloptera Corydalidae

Scientific Name: *Nigronia serricornis*  
 Common Name: Hellgrammite (F)

## Abundance

- 0-50
- 50-100
- 100+

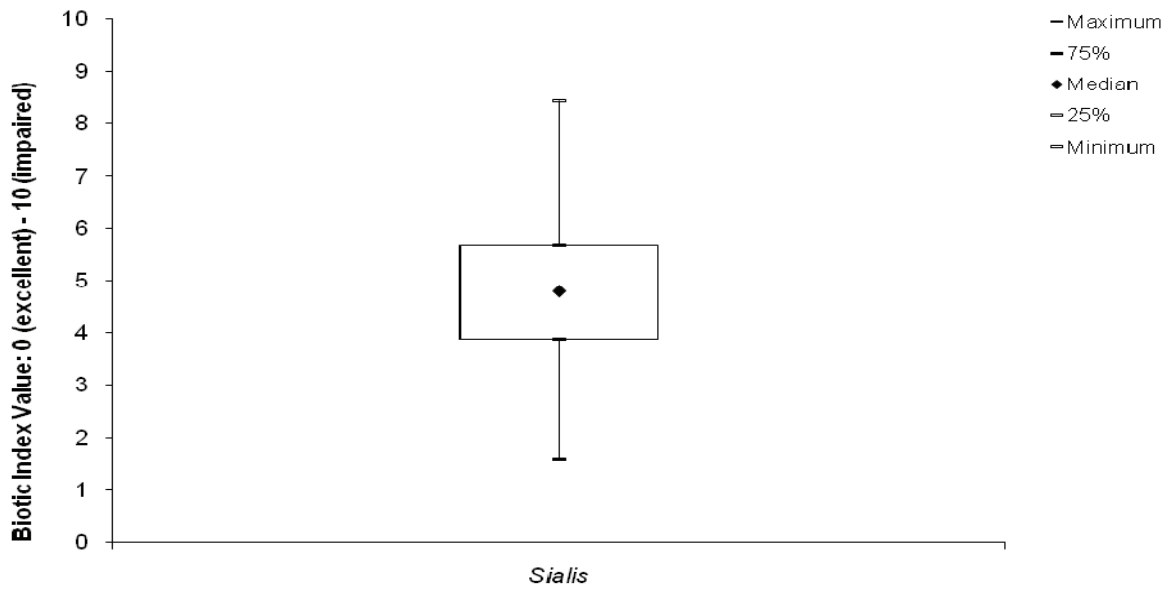
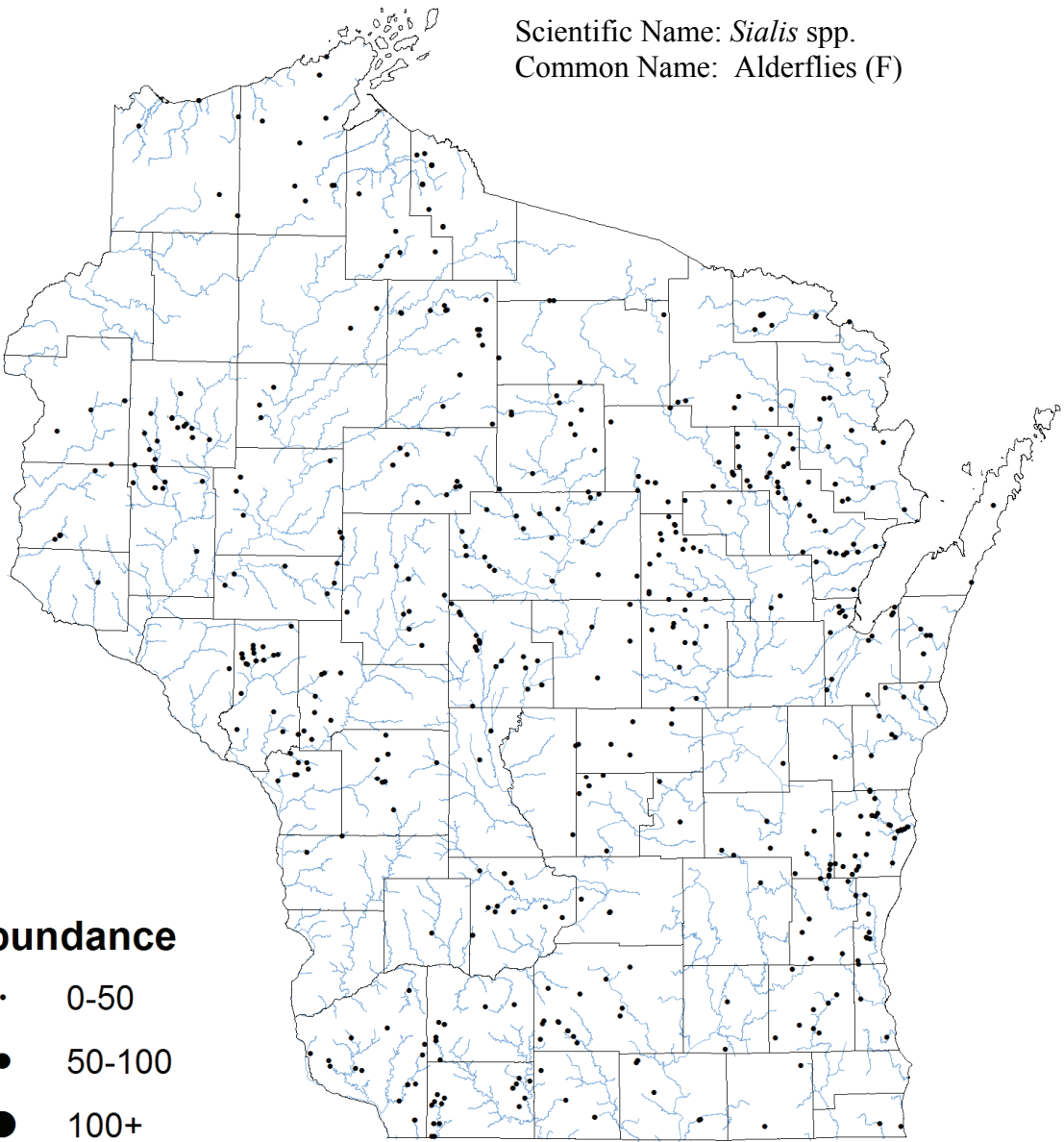


Megaloptera Sialidae

Scientific Name: *Sialis* spp.  
Common Name: Alderflies (F)

Abundance

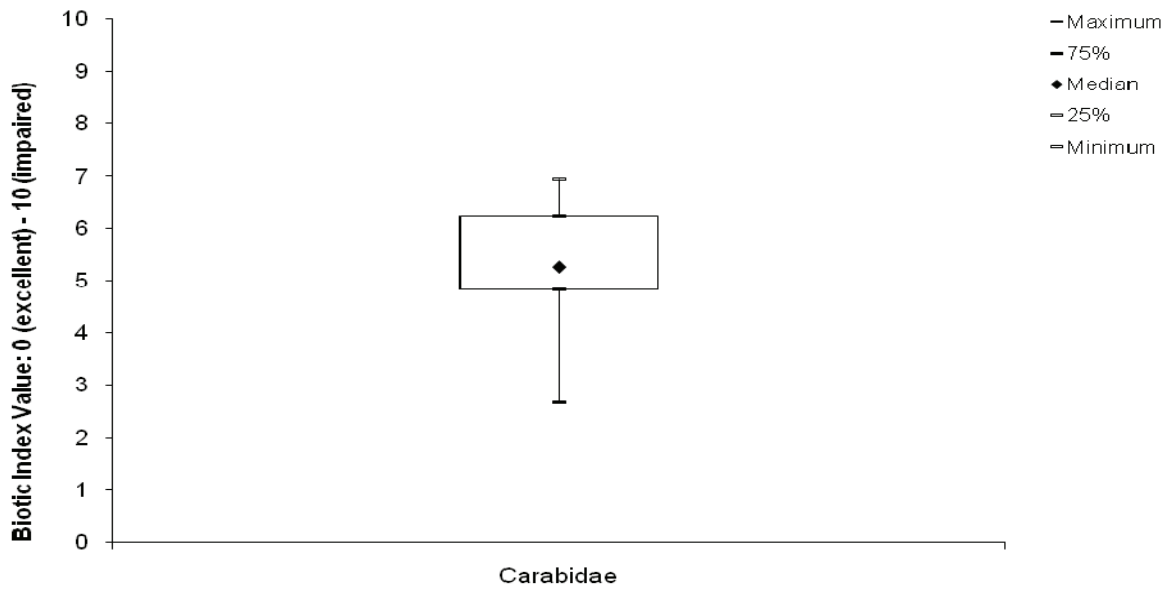
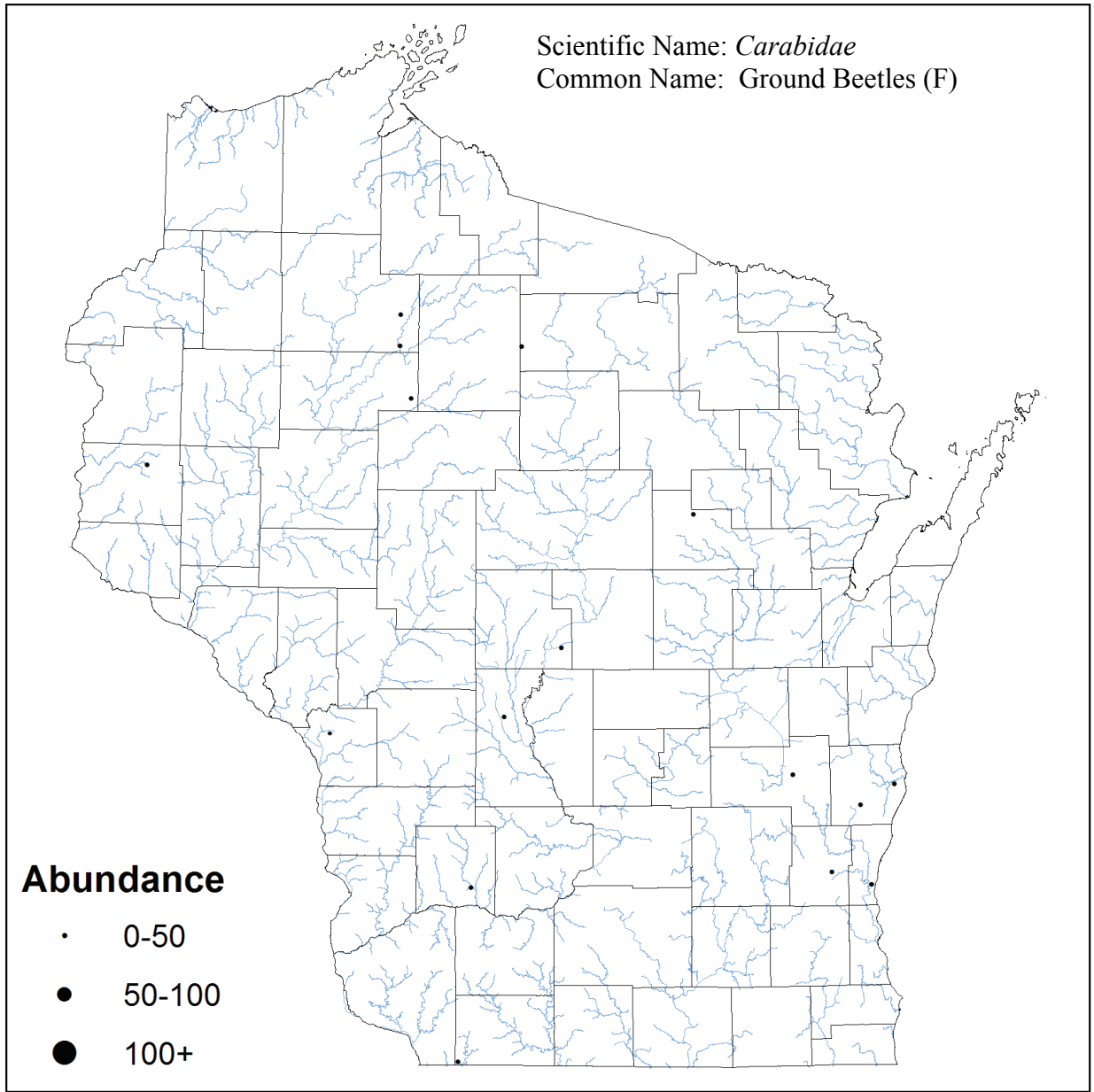
- 0-50
- 50-100
- 100+

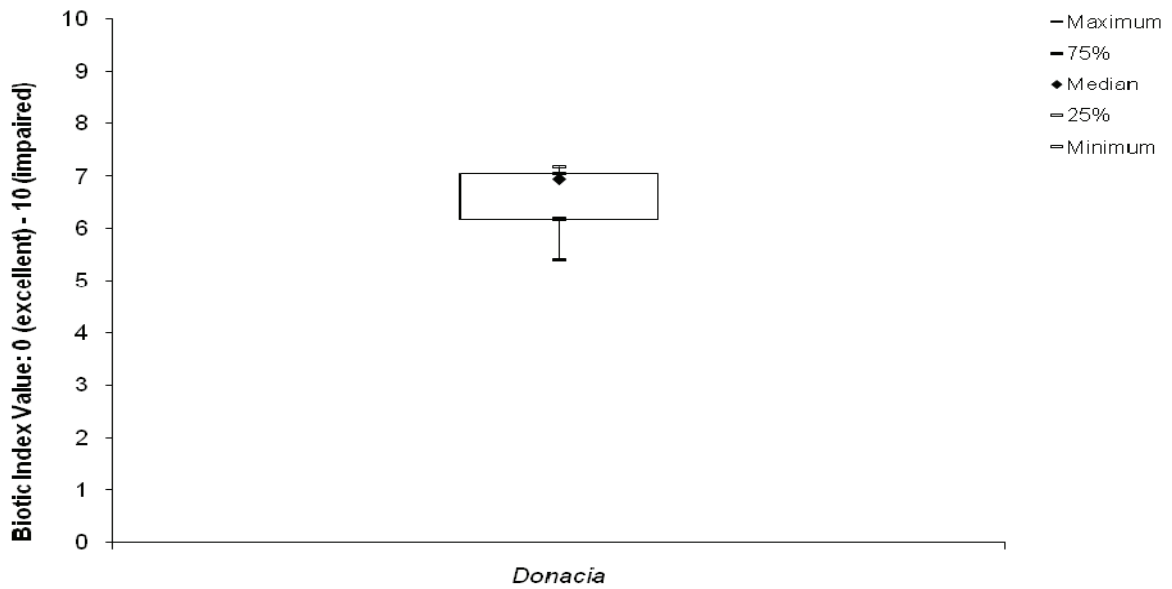
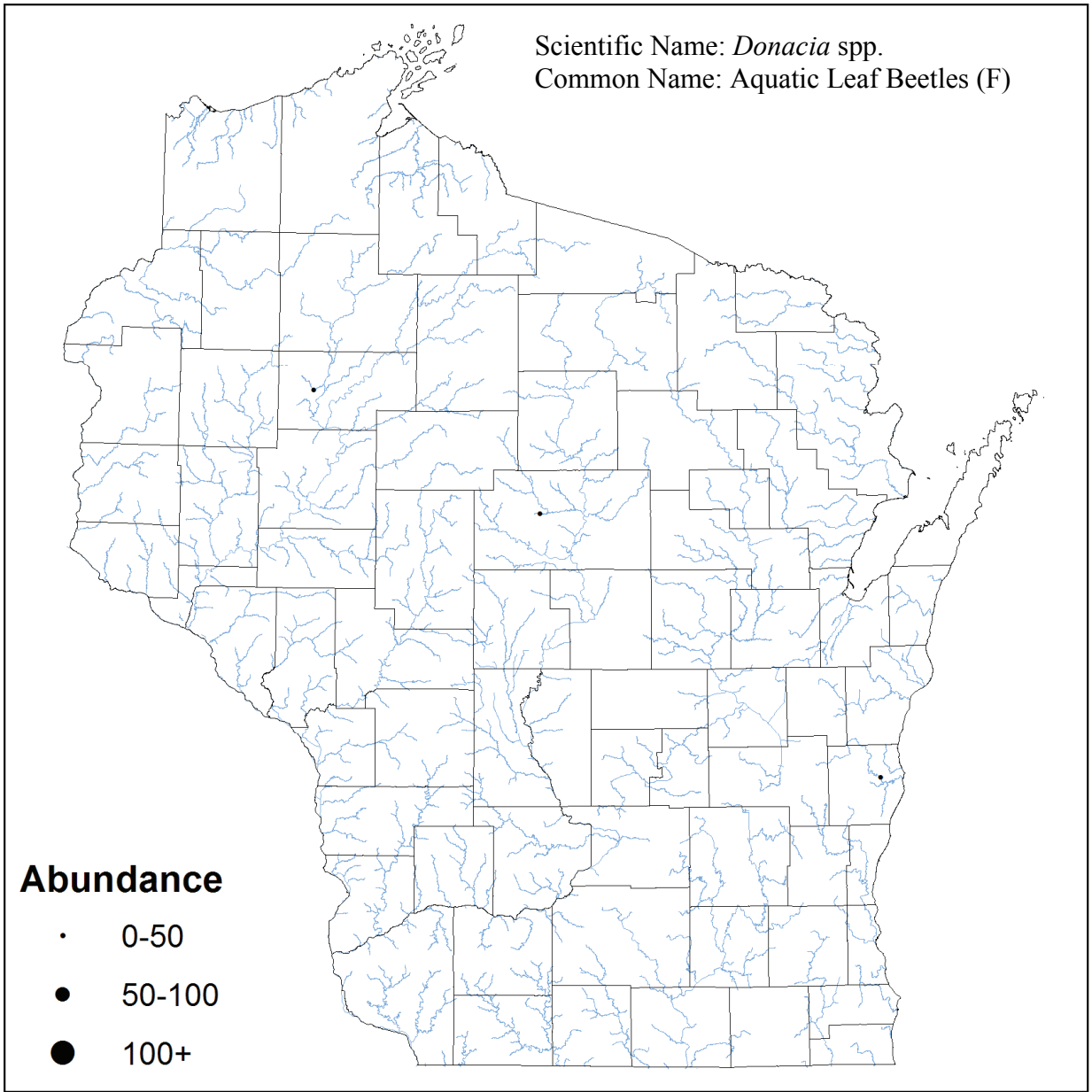




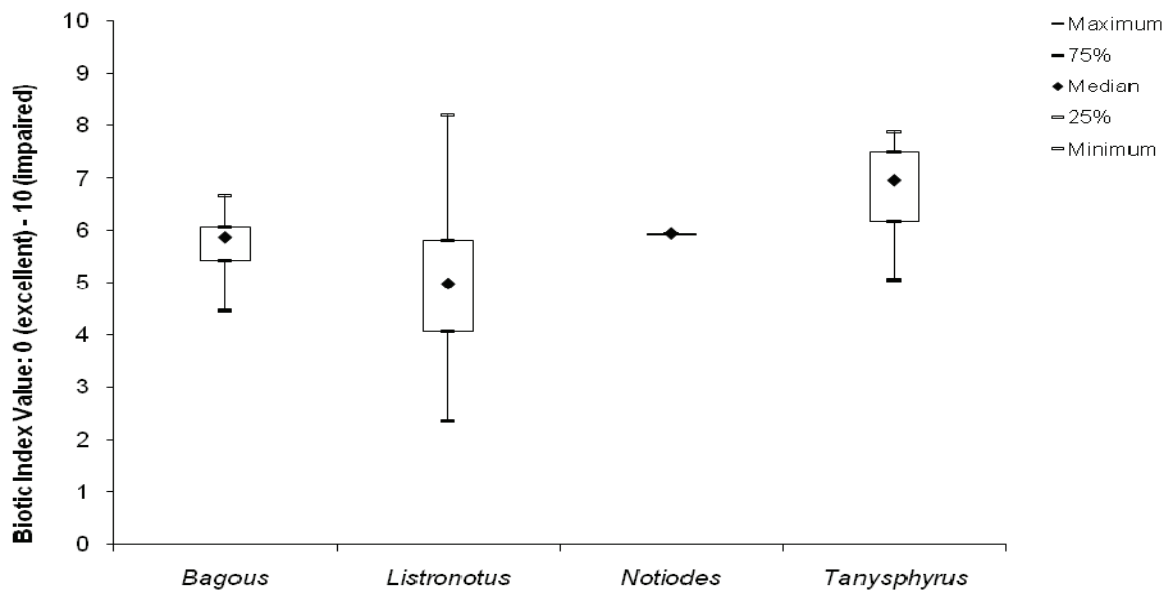
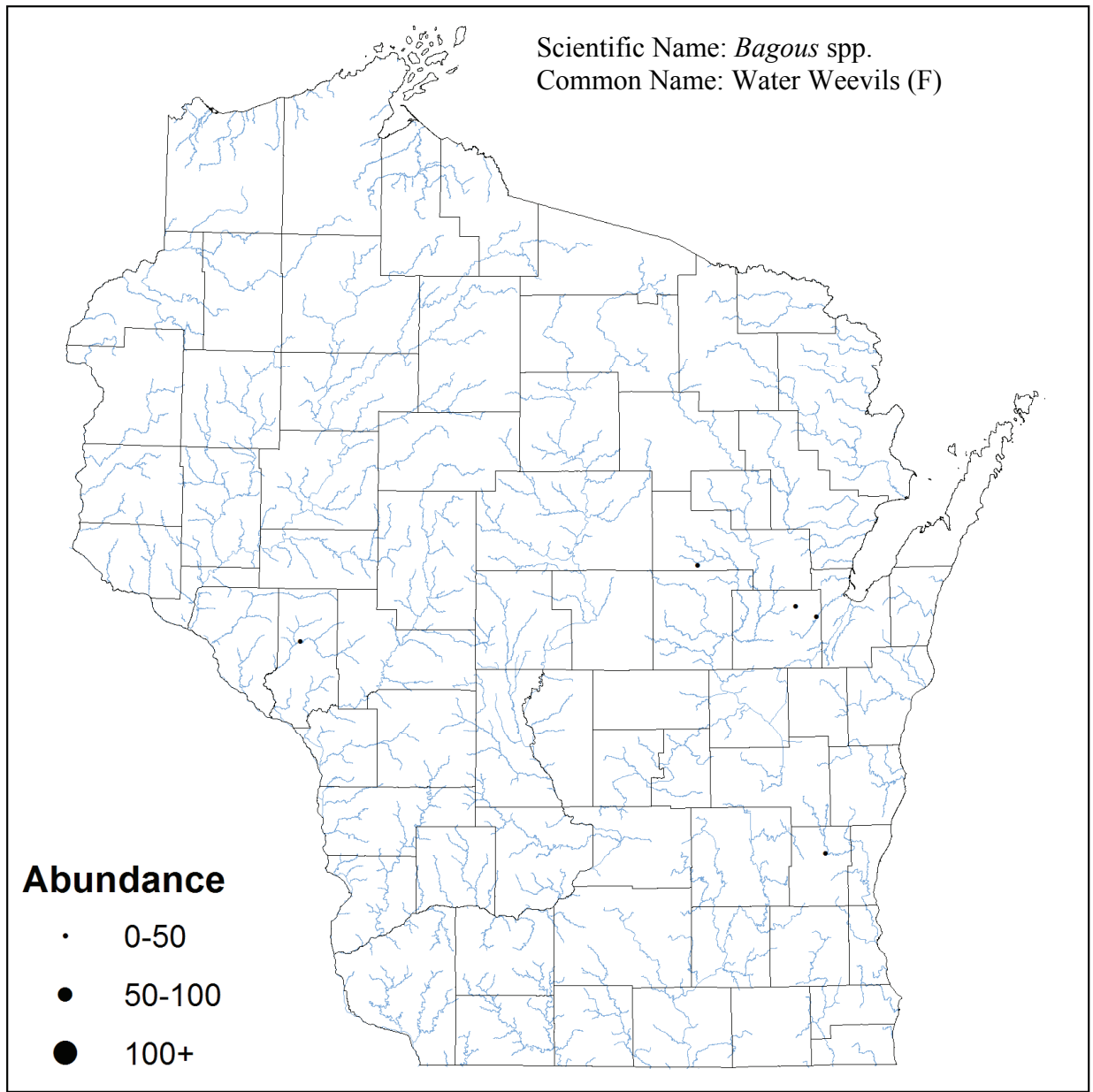
## Section VI: Coleoptera (Beetles)

# Coleoptera Carabidae

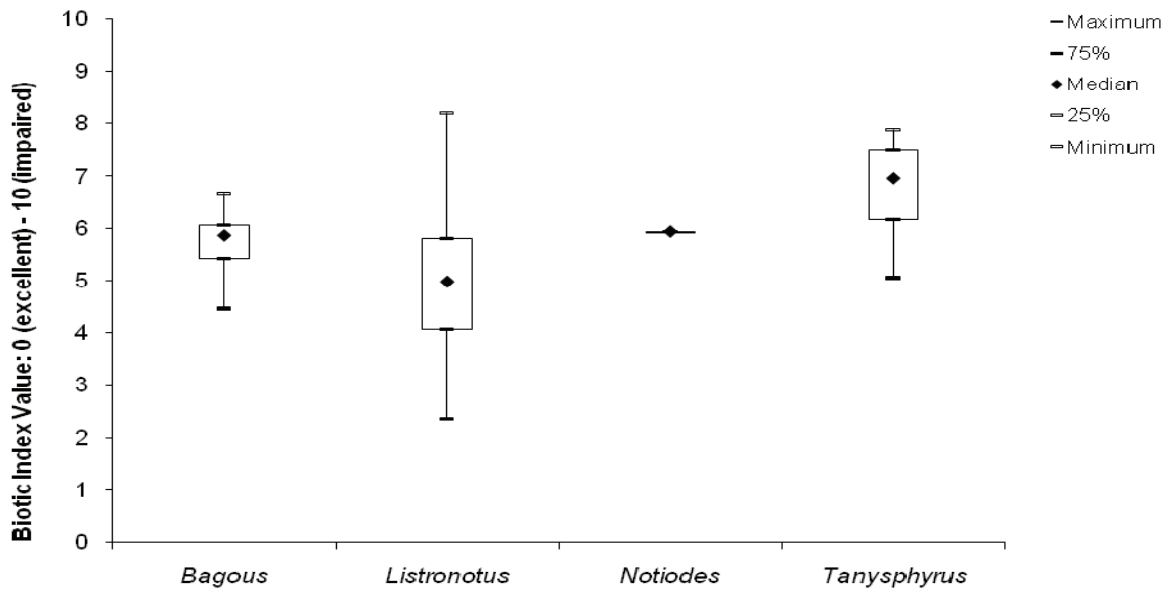
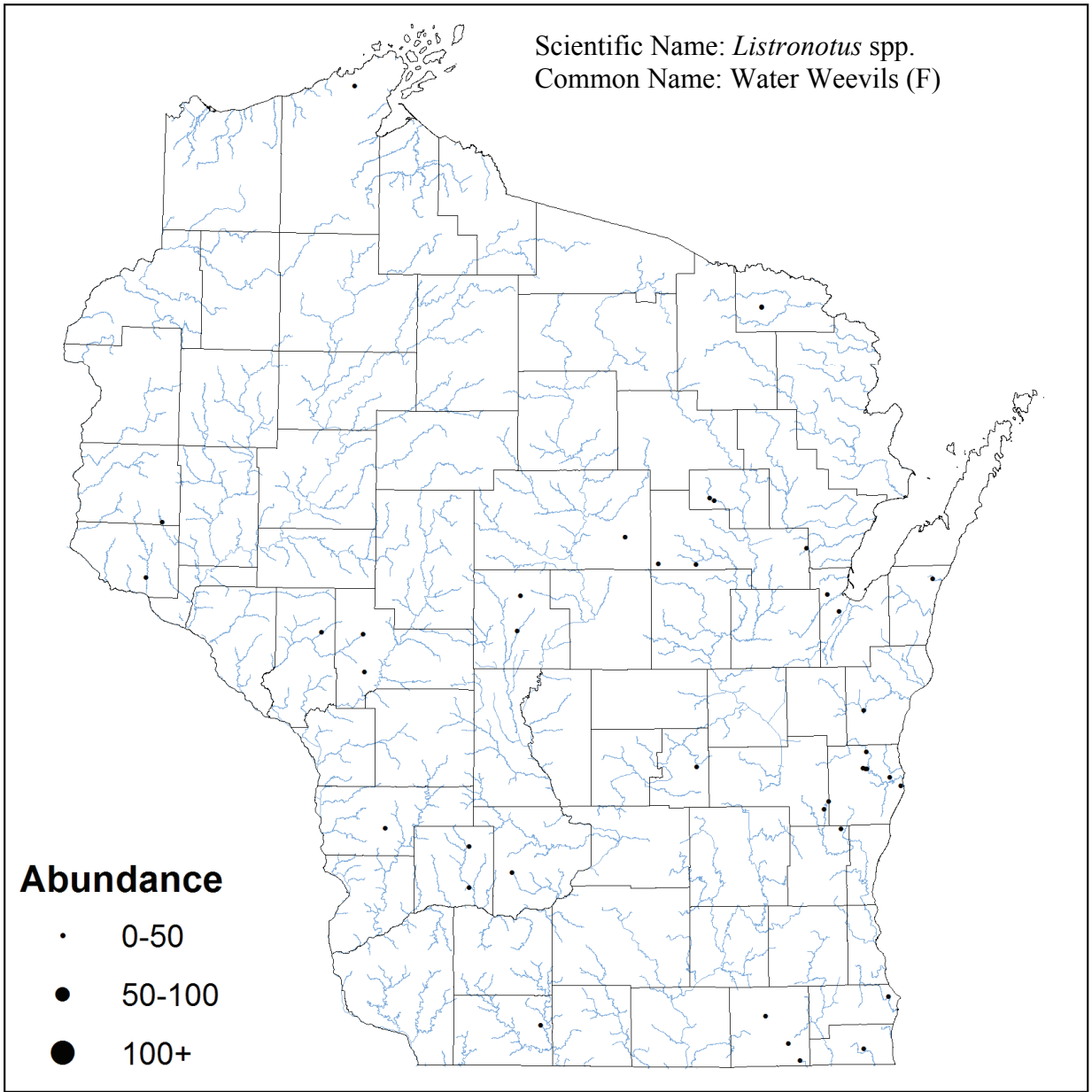




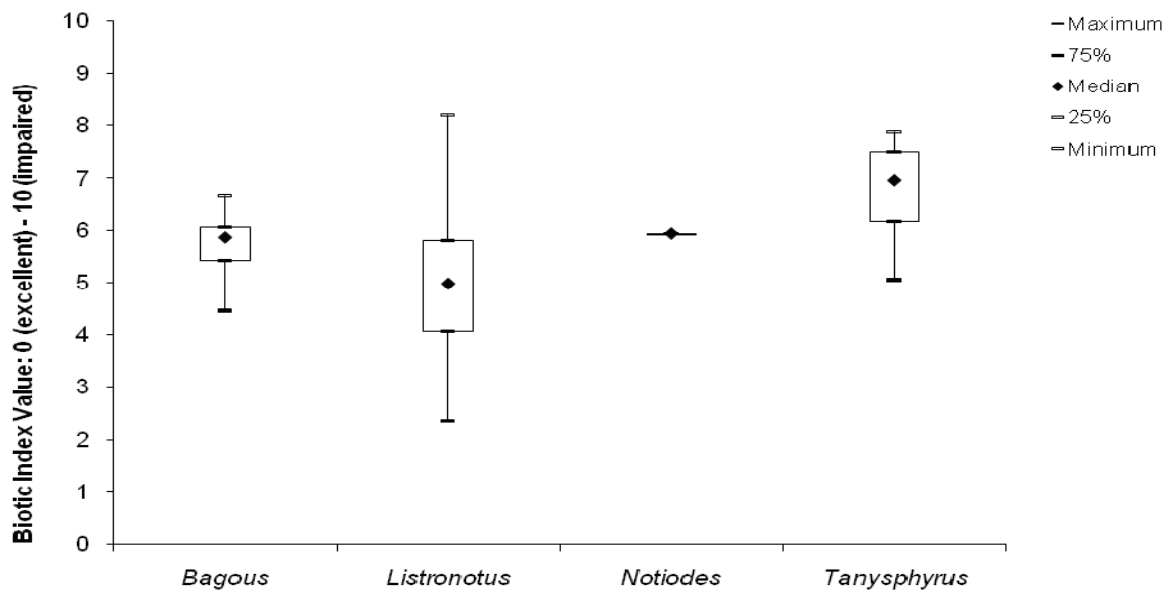
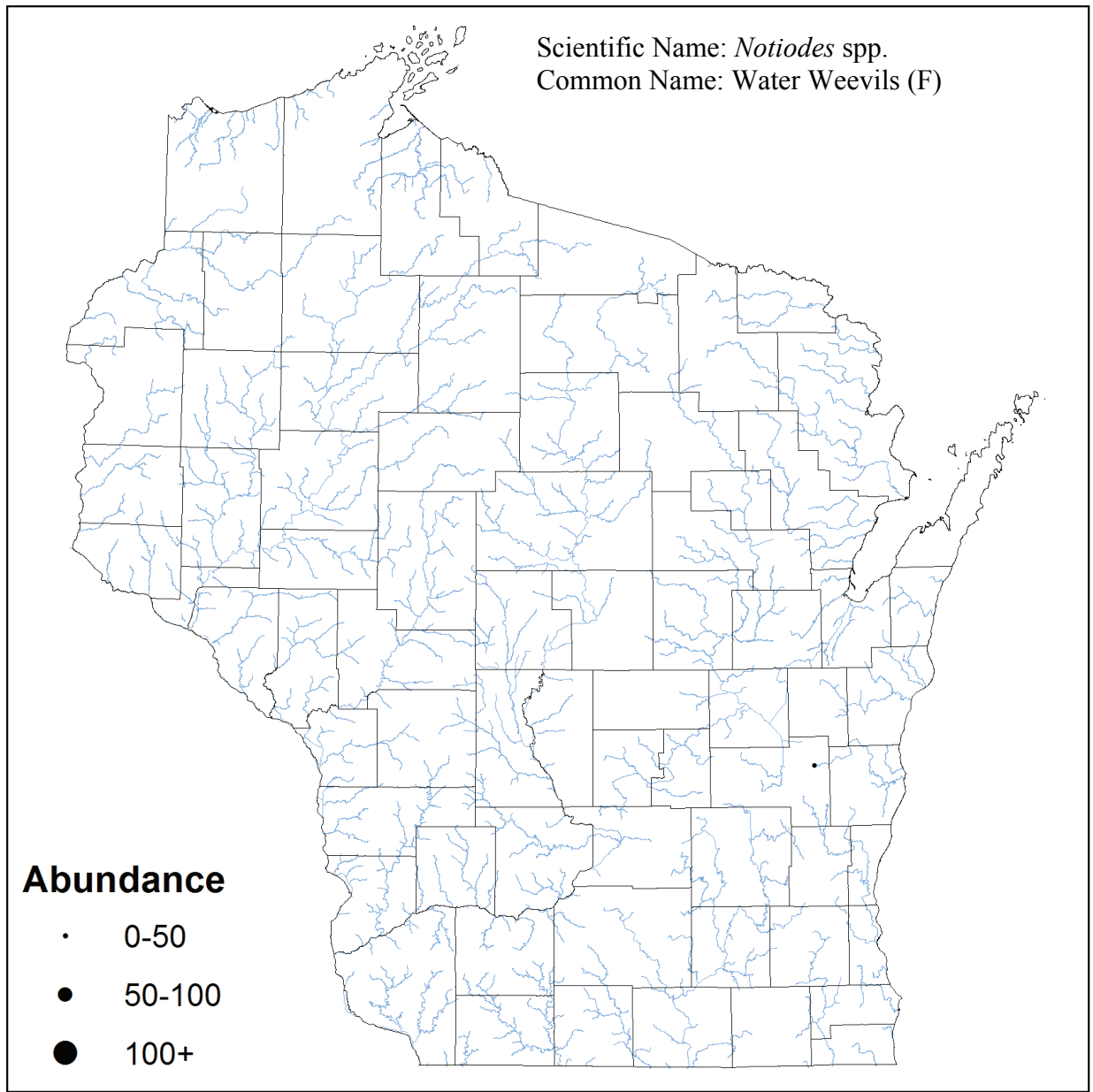
# Coleoptera Curculionidae

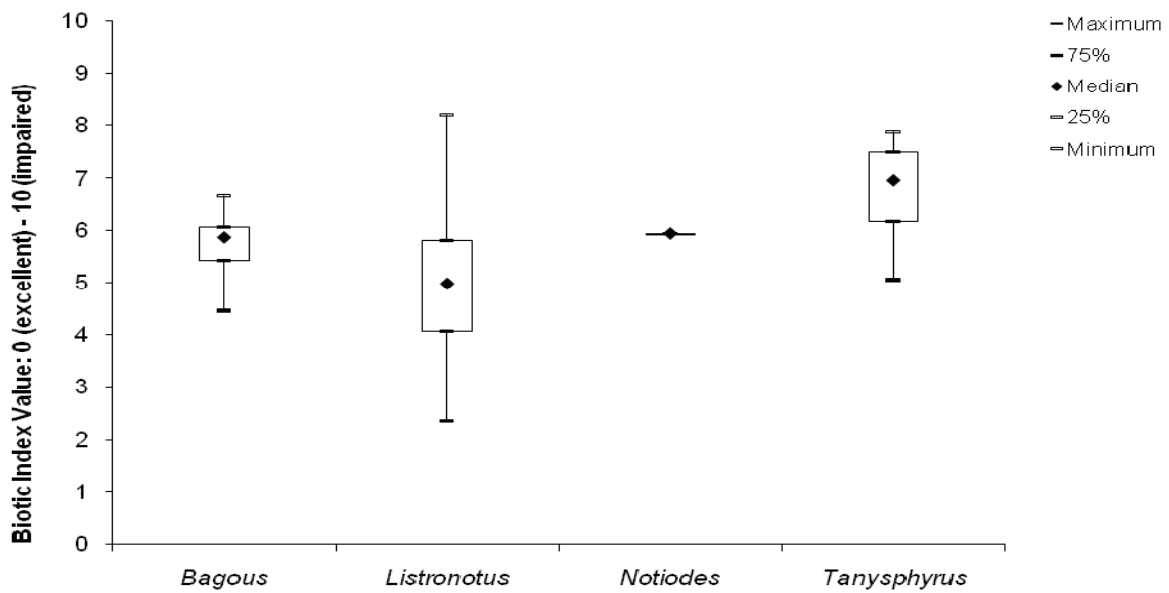
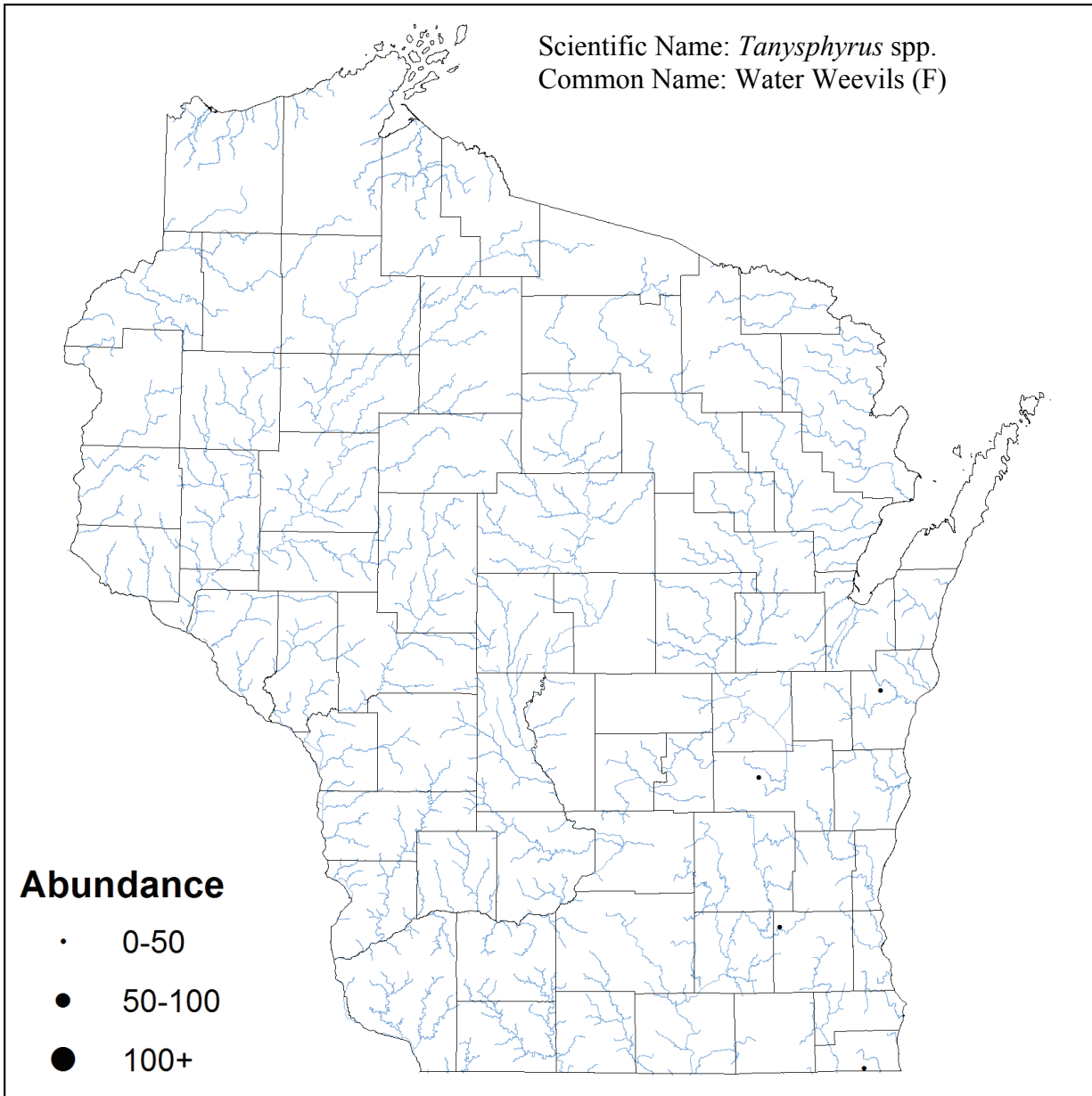




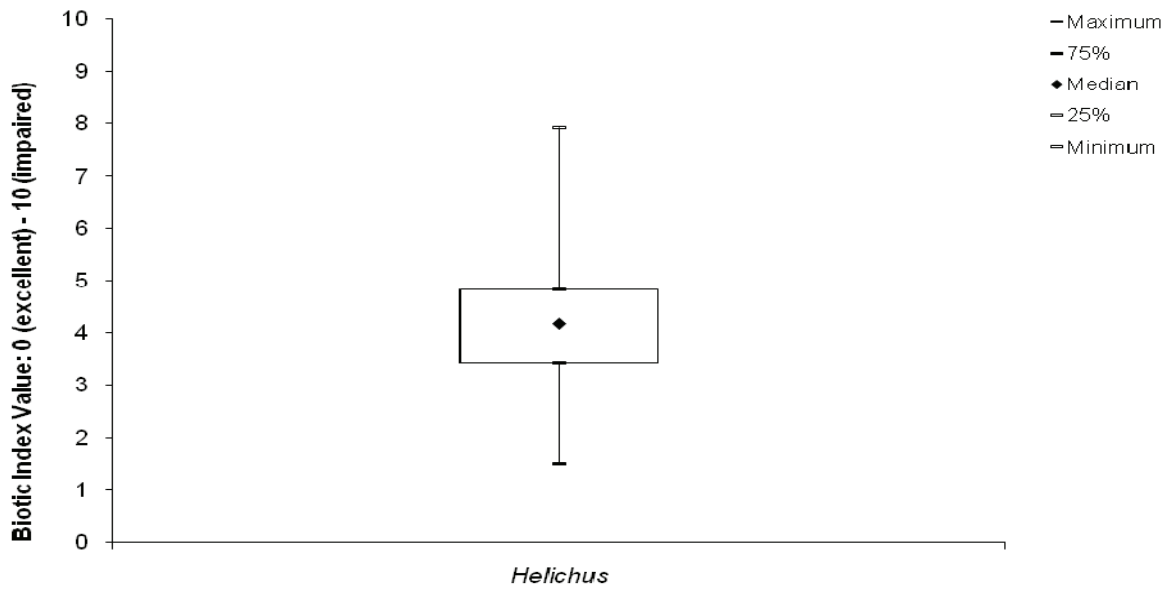
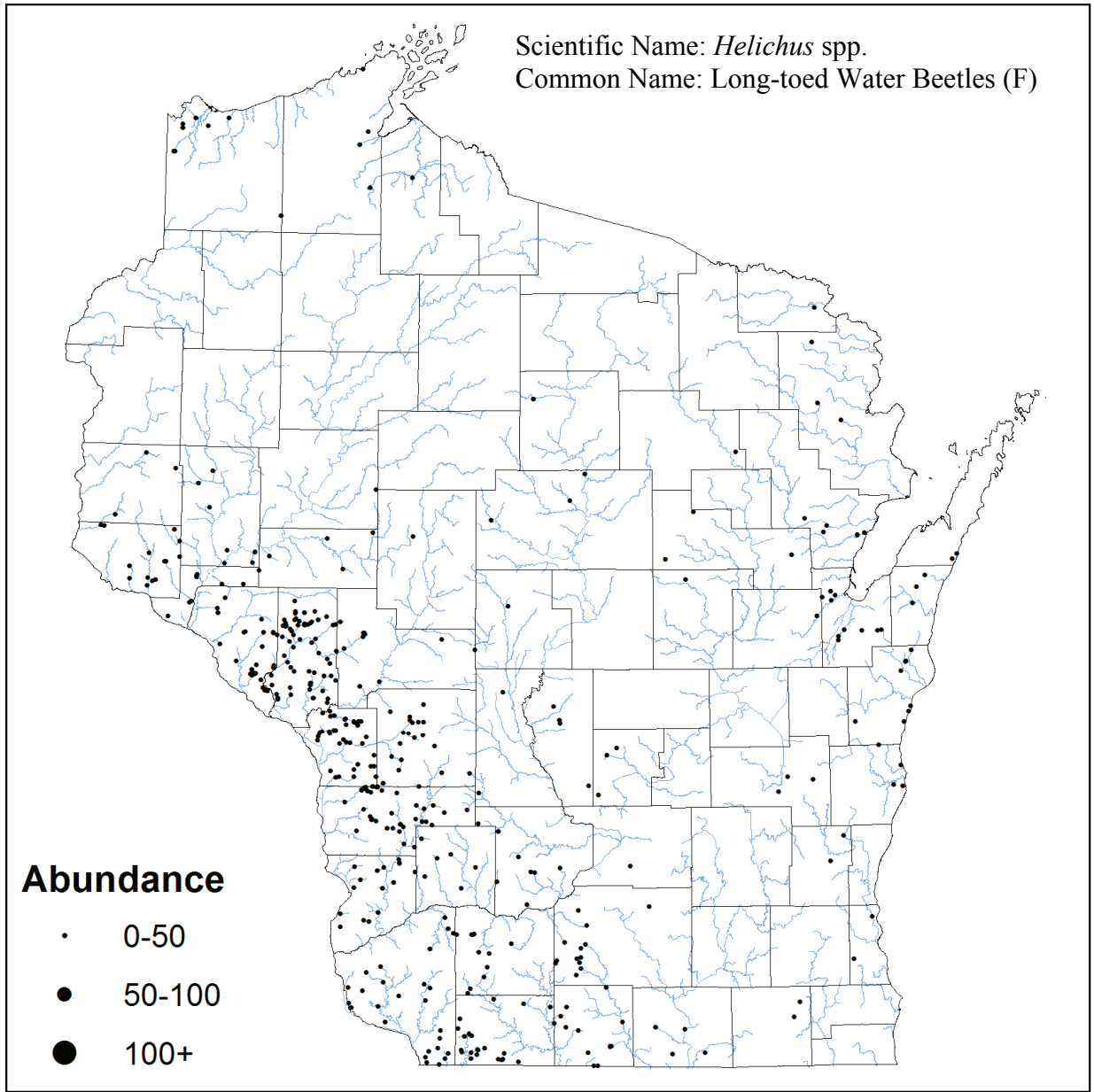


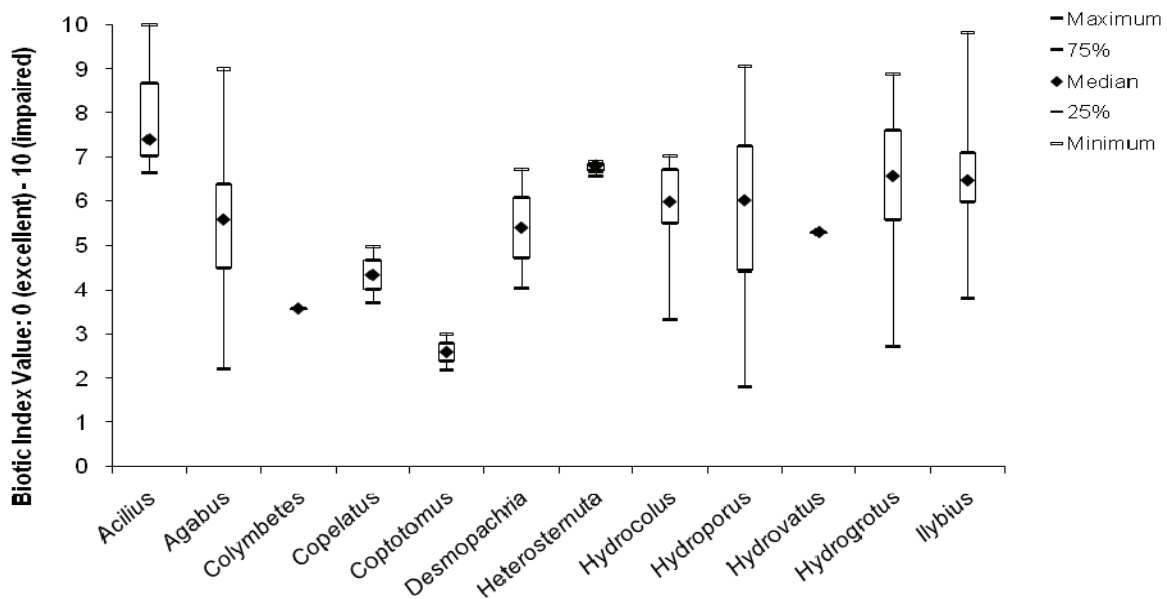
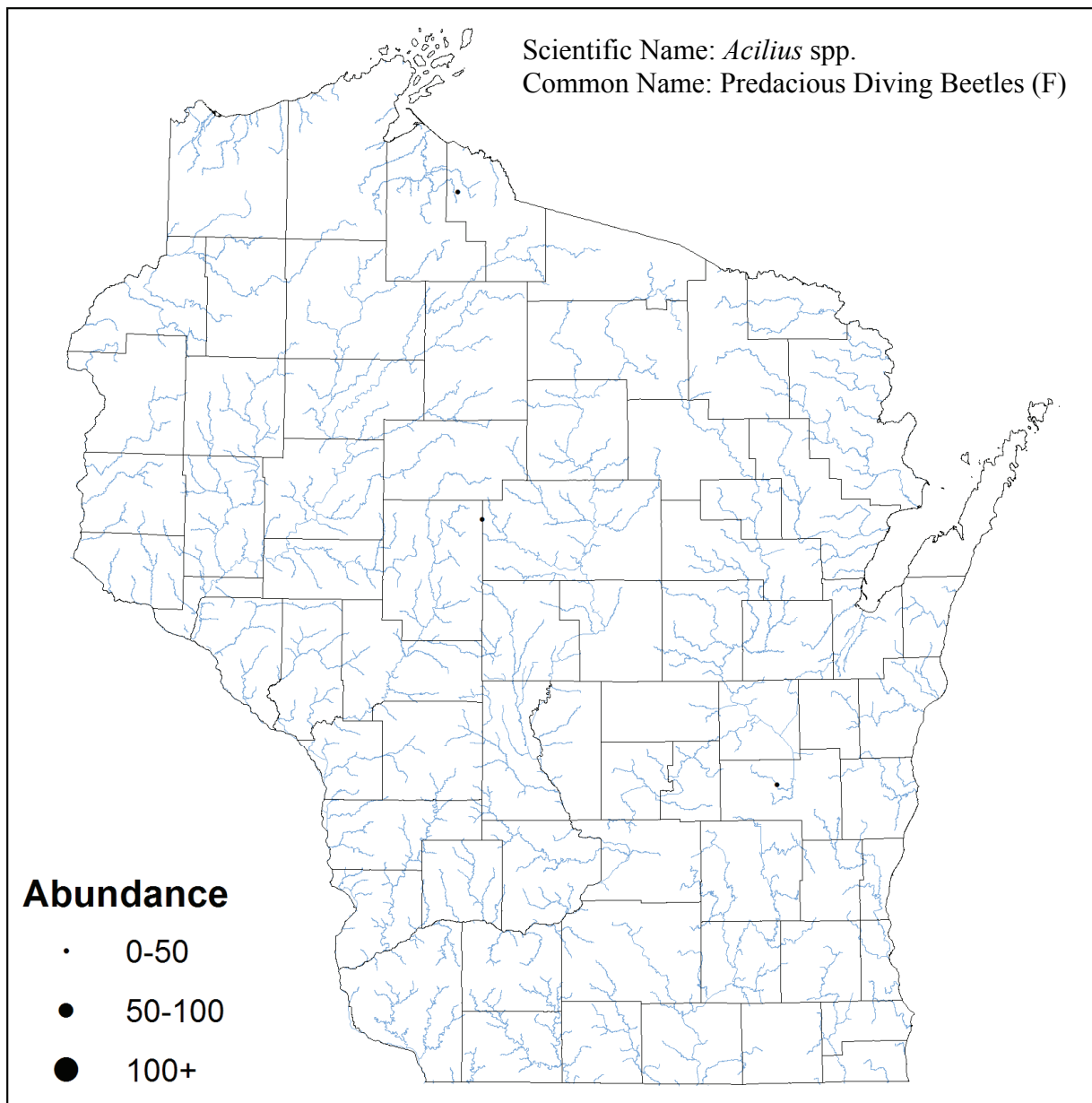
# Coleoptera Curculionidae





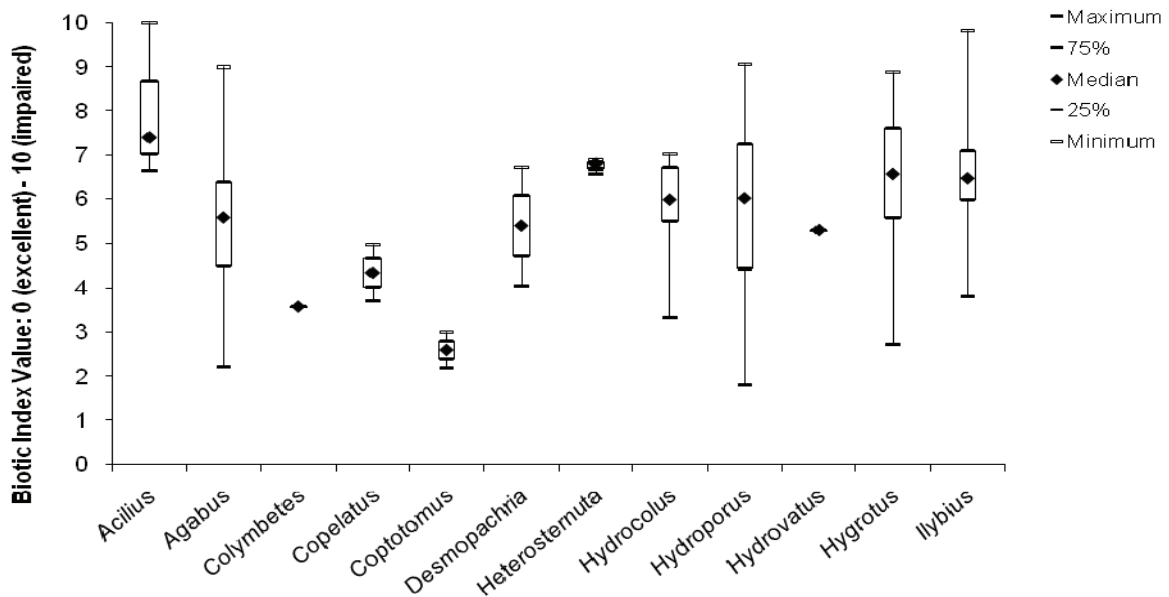
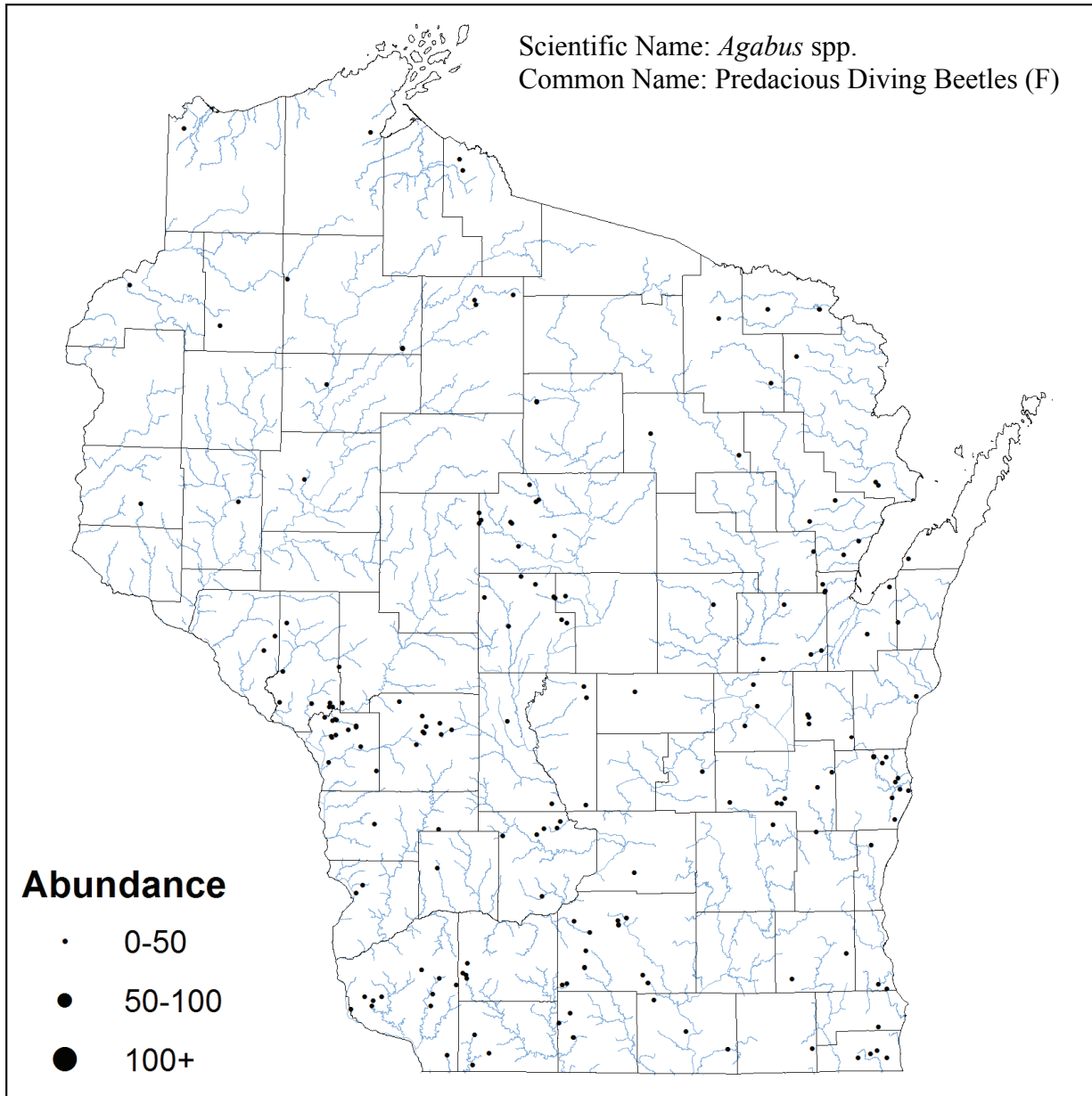
# Coleoptera Dryopidae



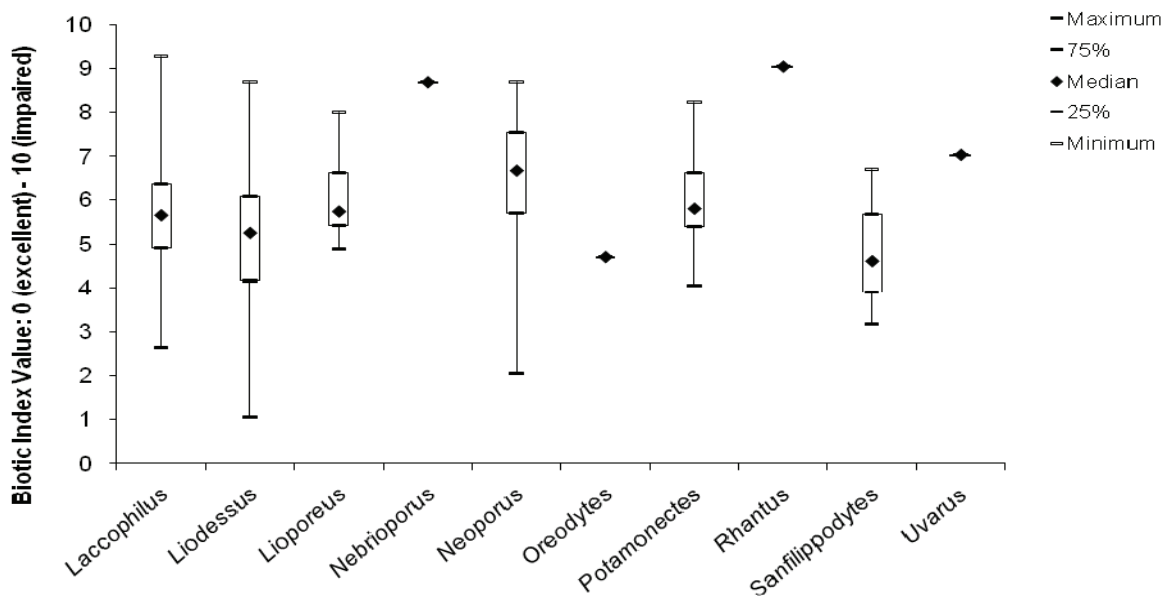
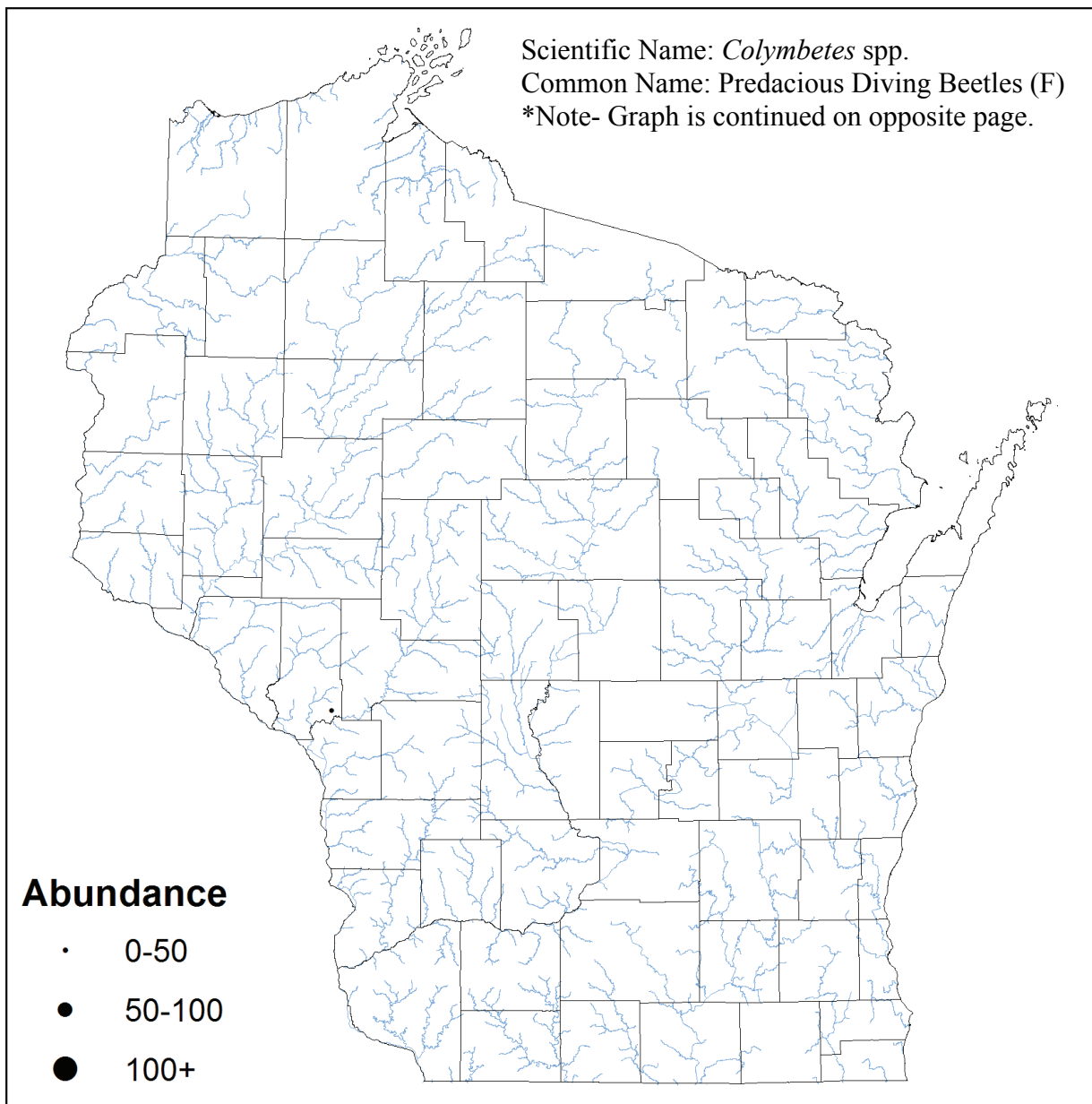


\*Note- Graph is continued on next page.

# Coleoptera Dytiscidae

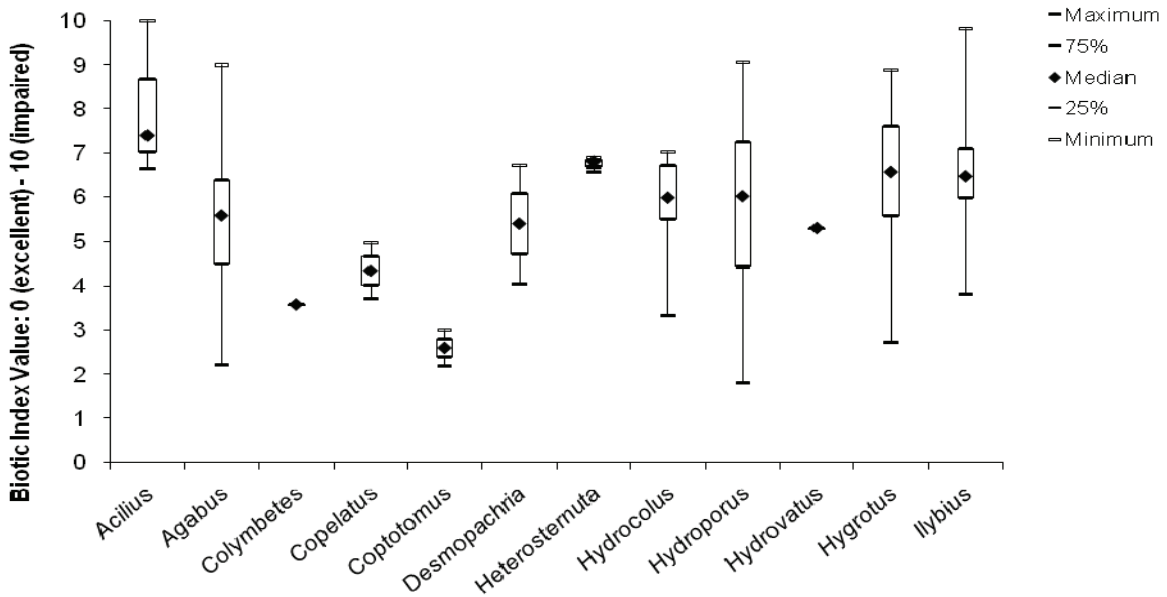
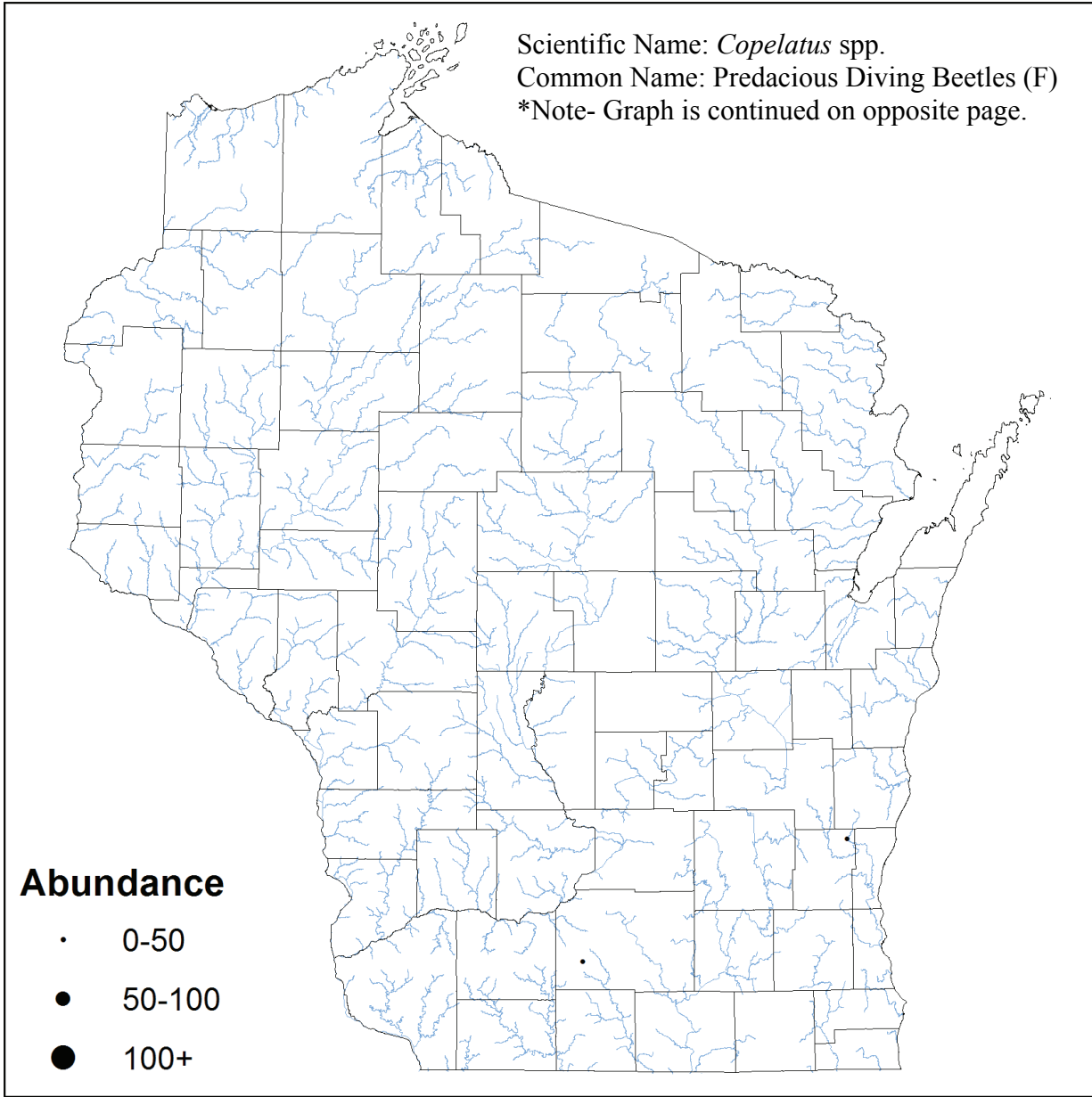


\*Note- Graph is continued on facing page.



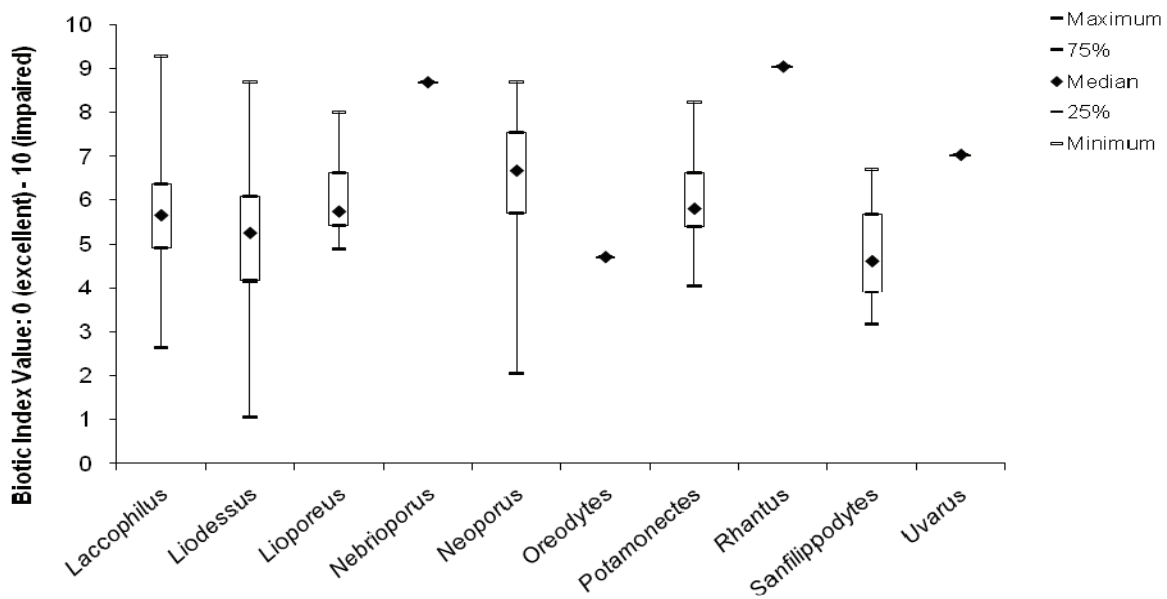
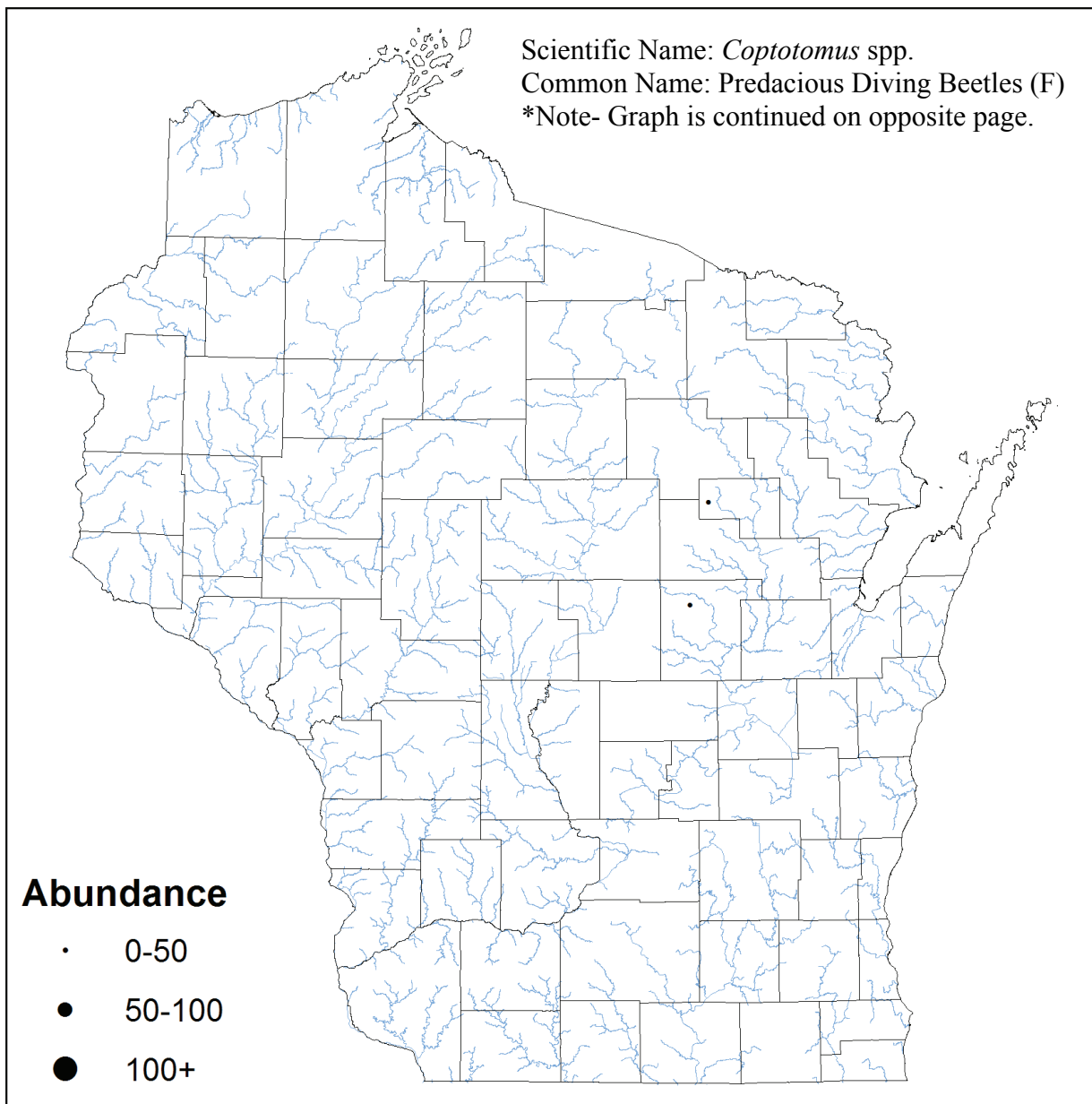
\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae



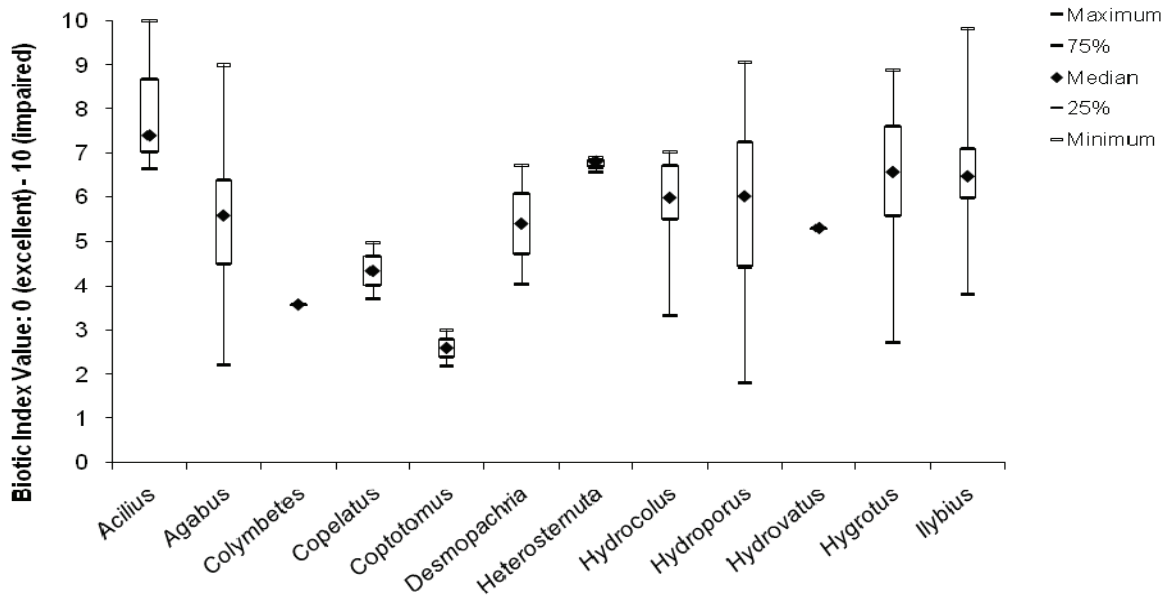
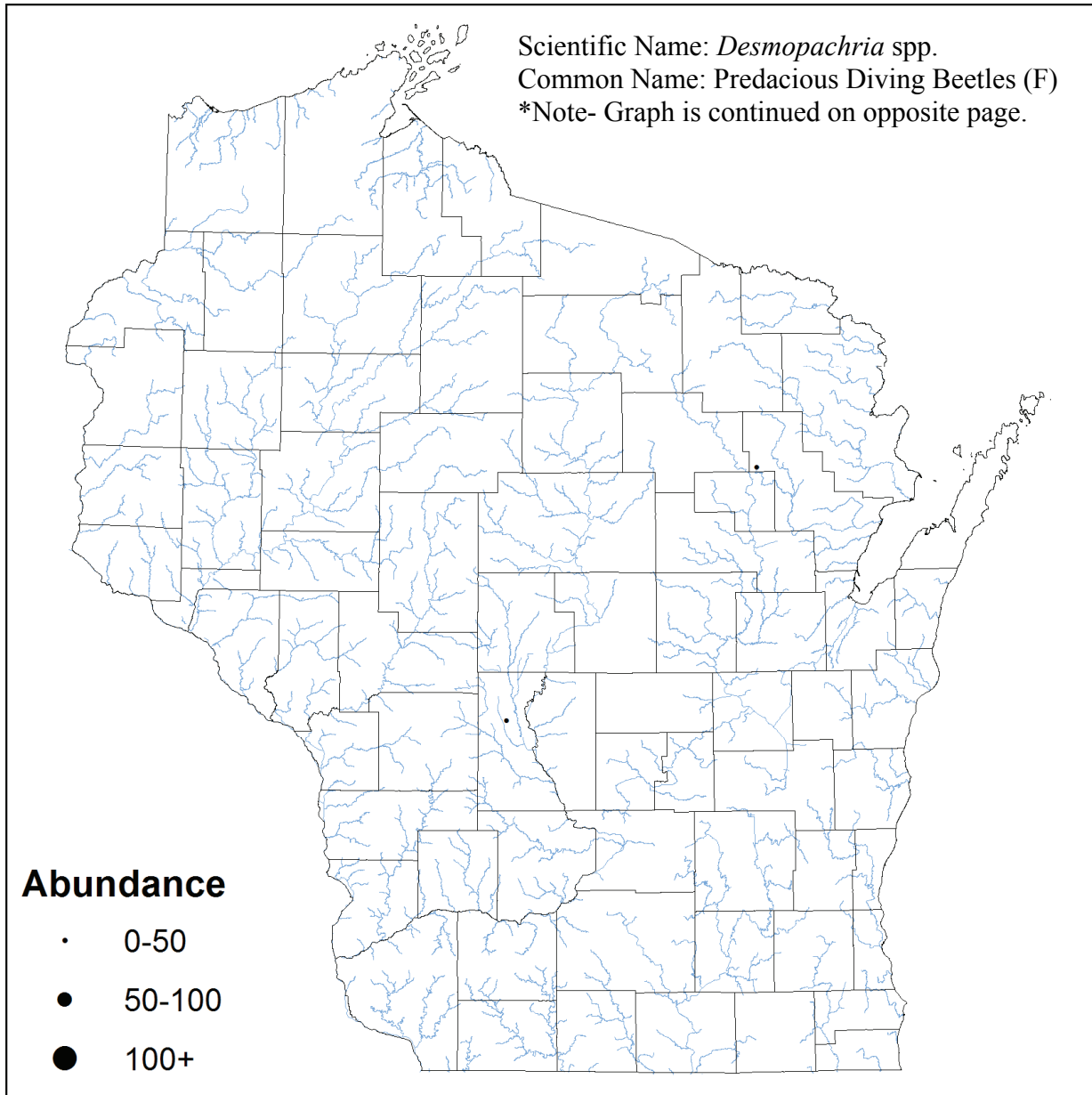
\*Note- Graph is continued on facing page.



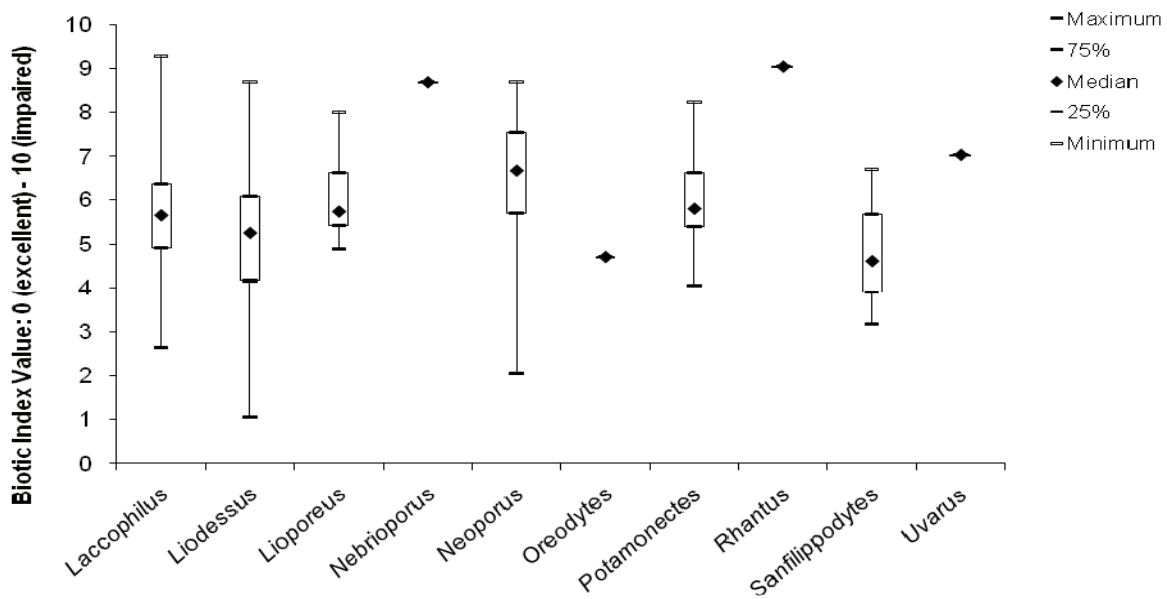
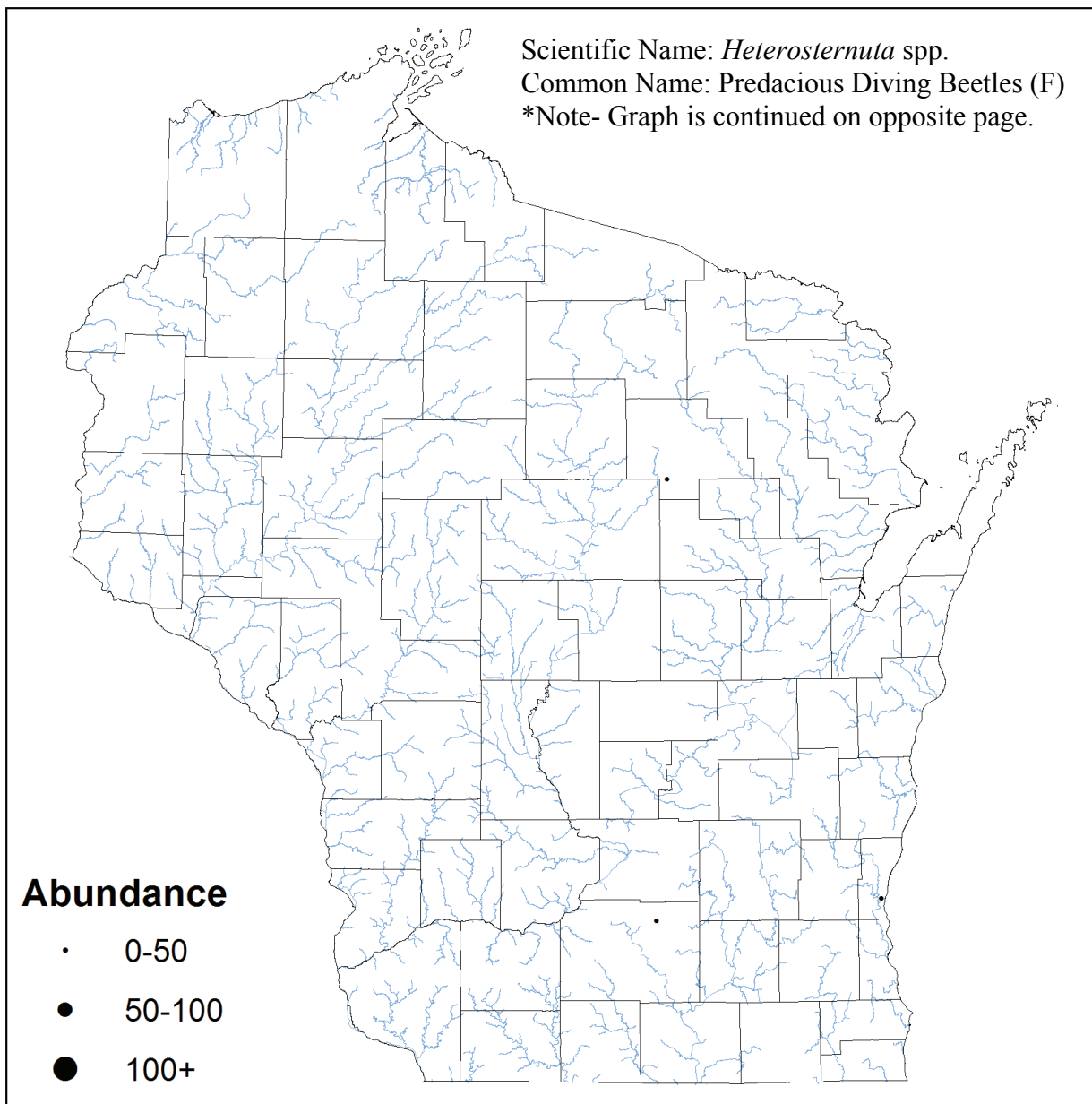


\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae

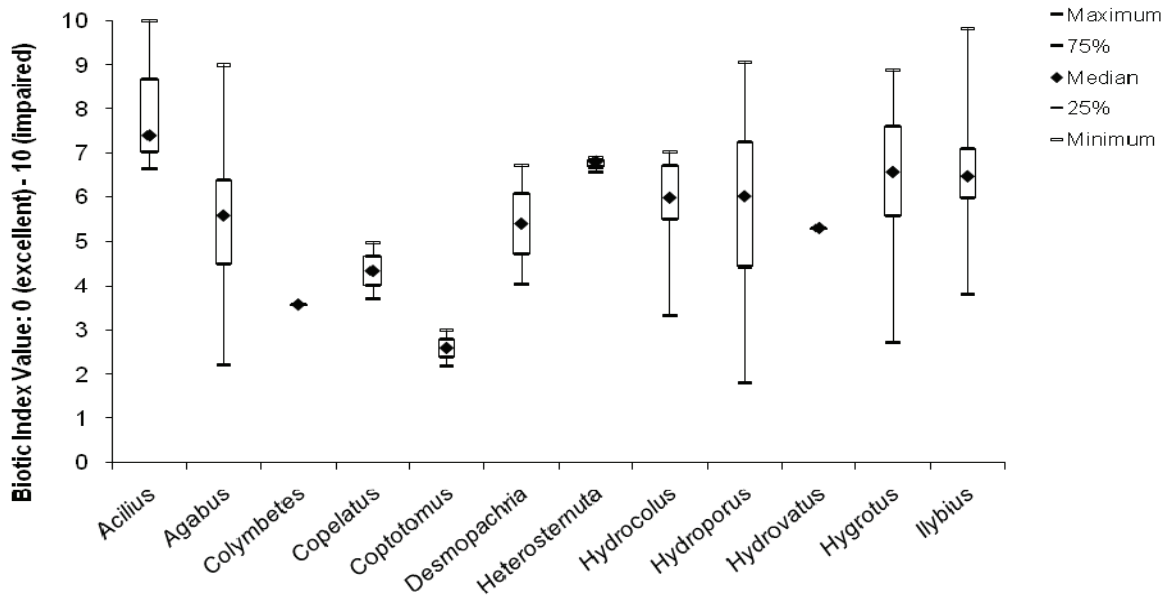
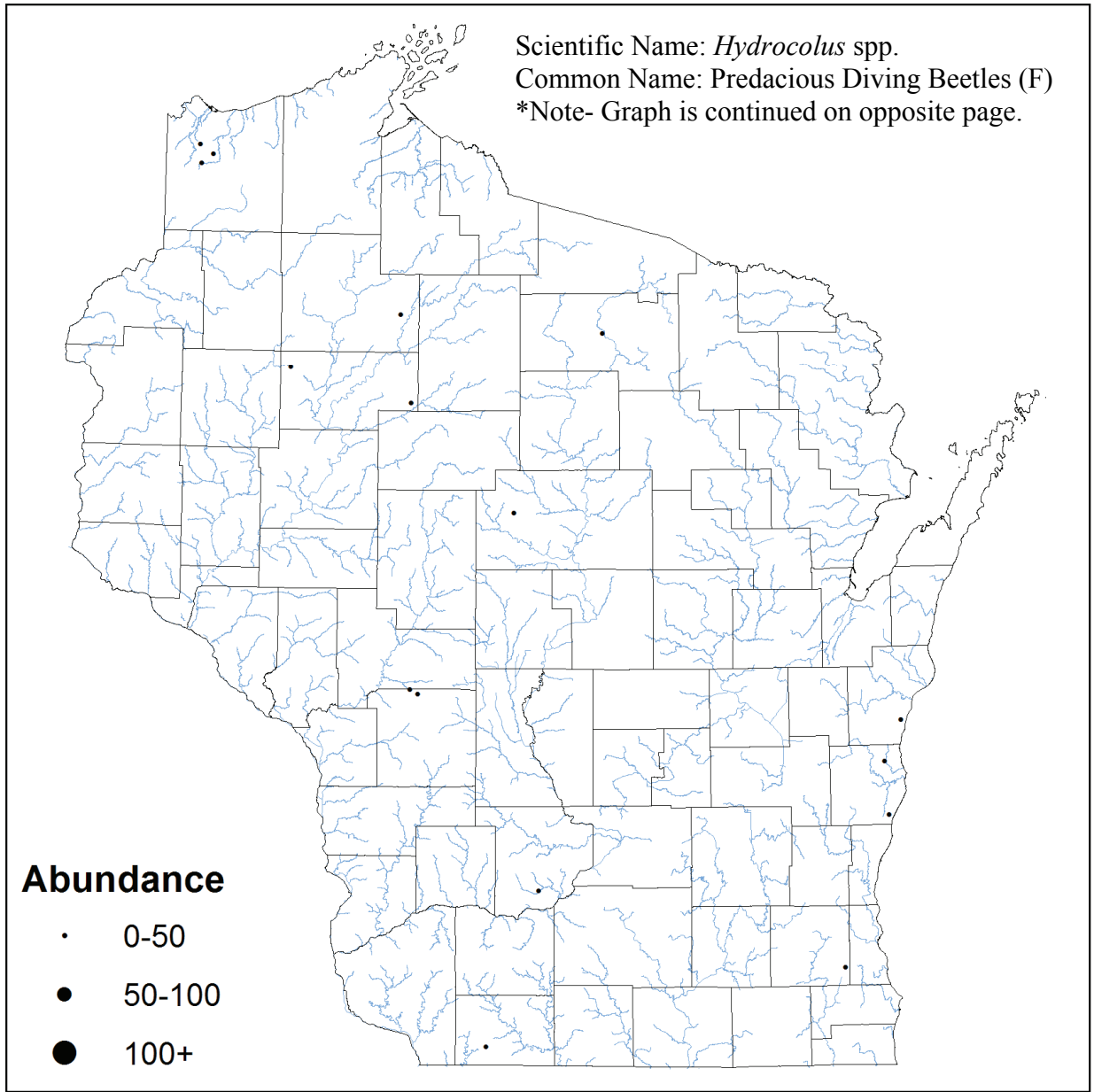


\*Note- Graph is continued on facing page.

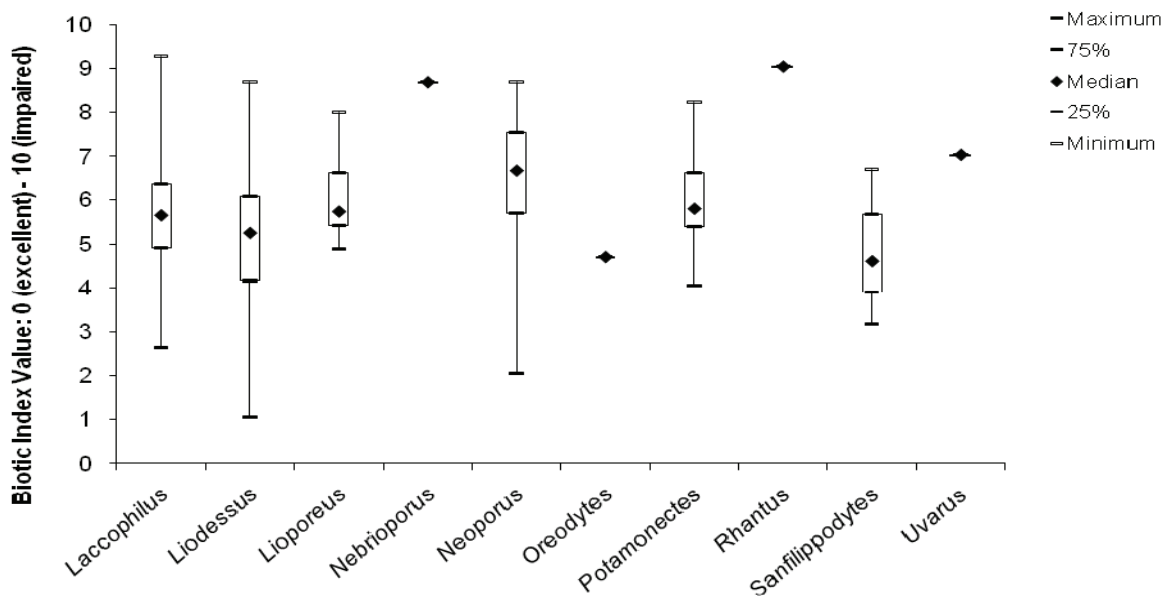
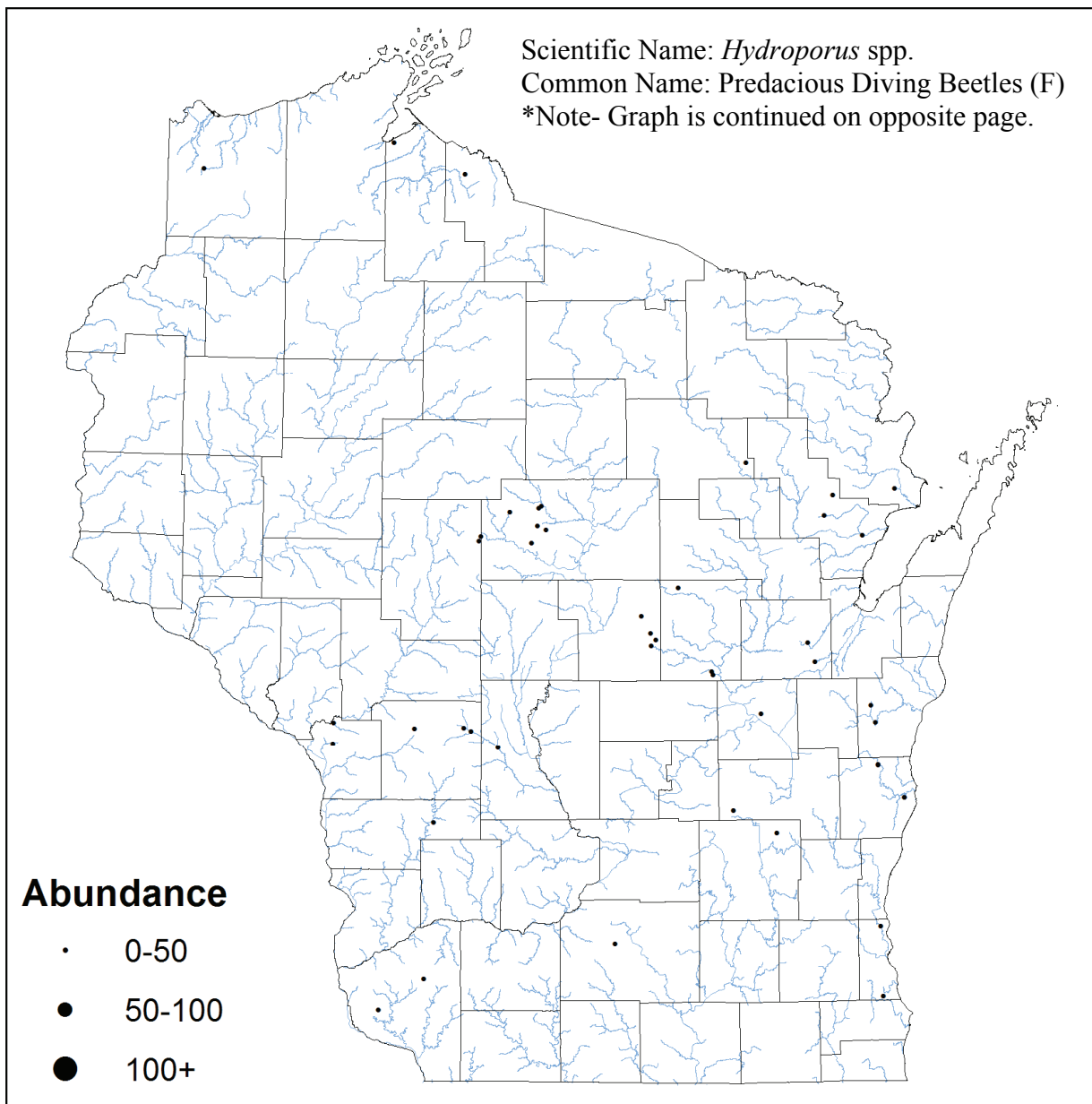


\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae

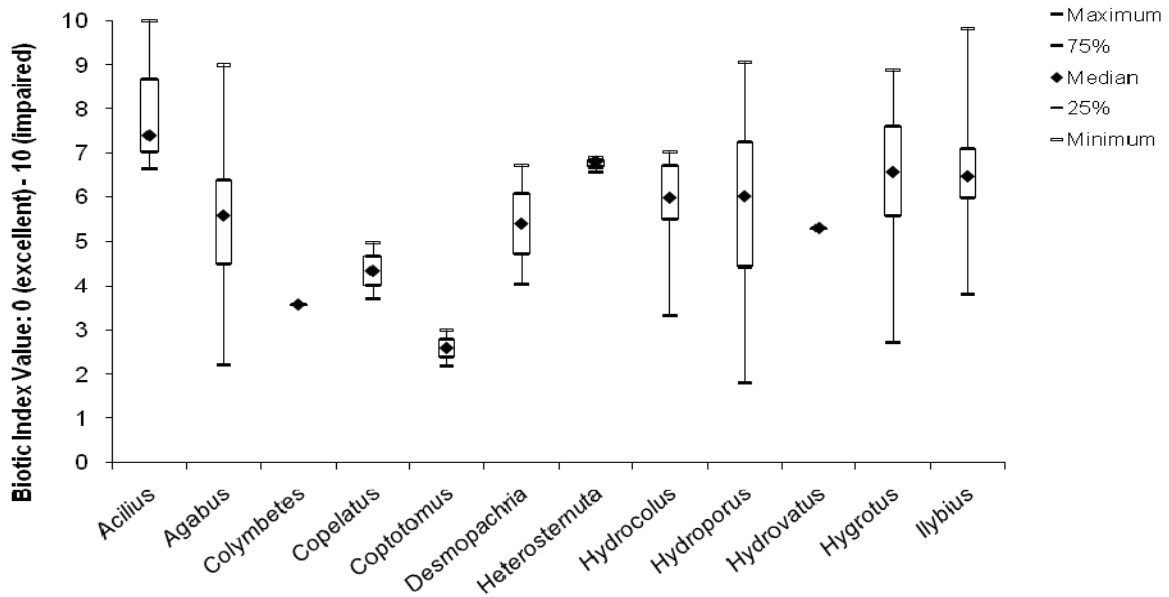
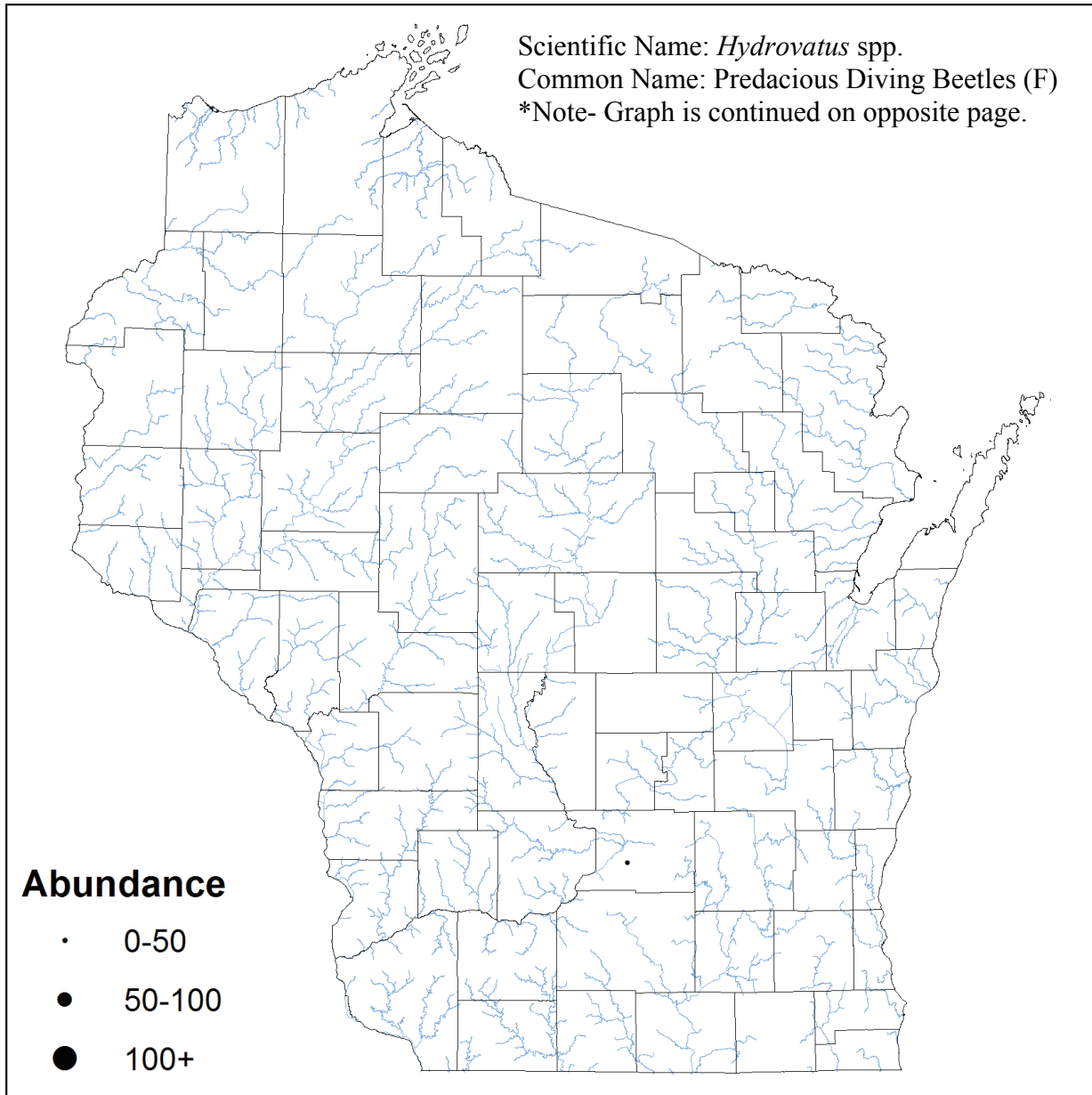


\*Note- Graph is continued on facing page.

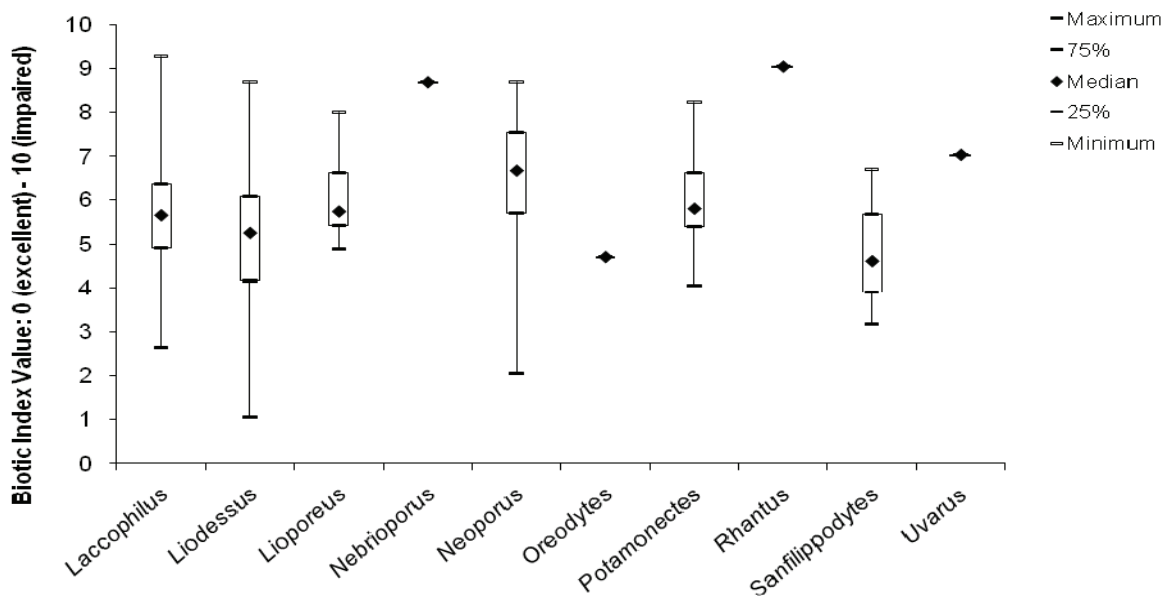
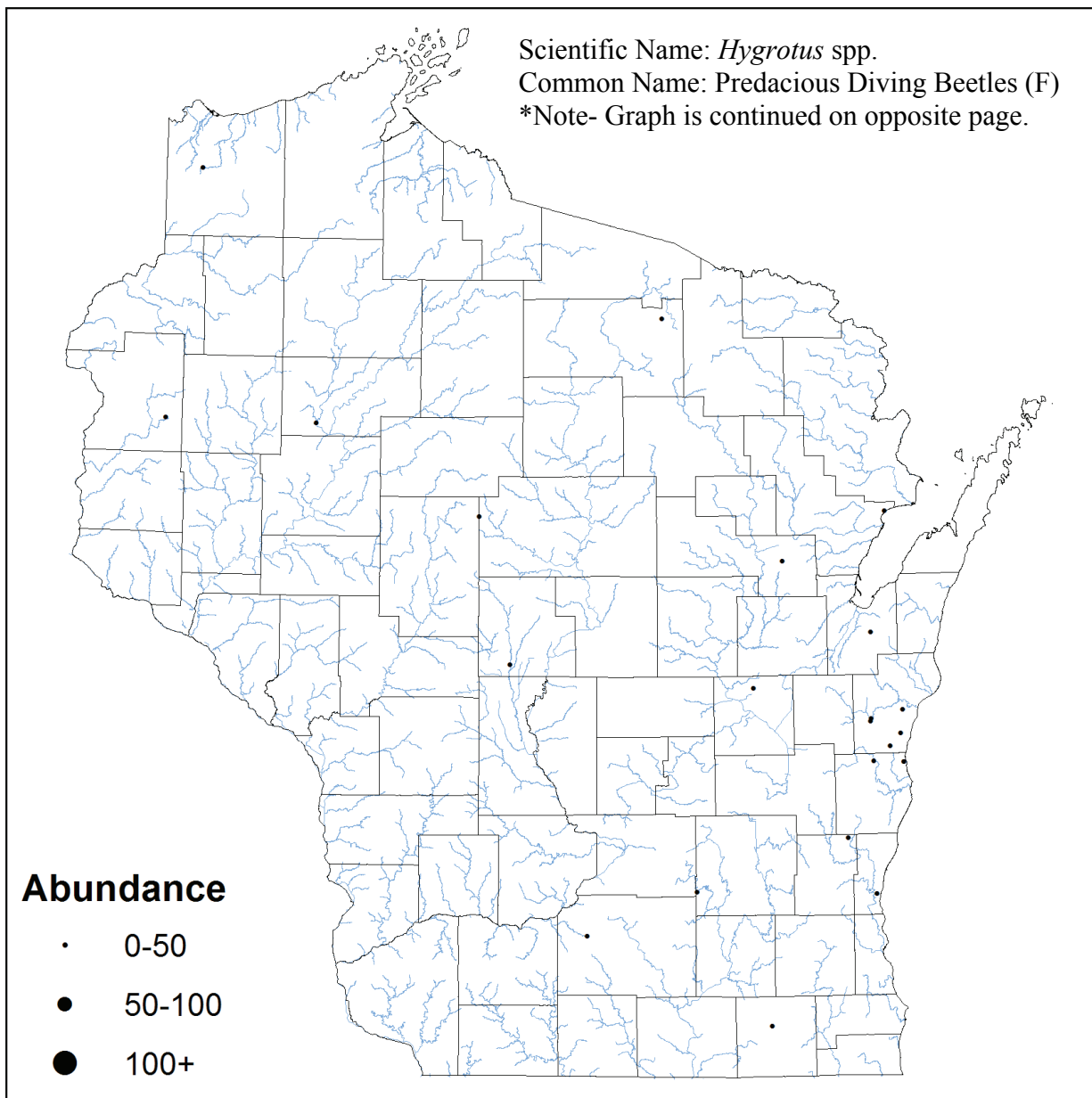


\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae

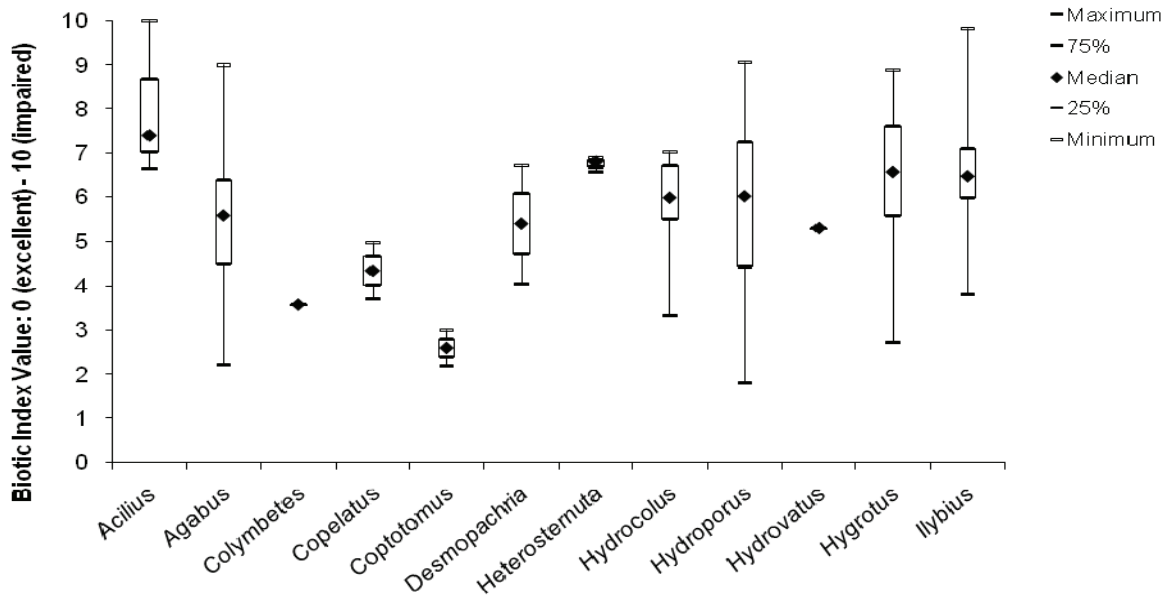
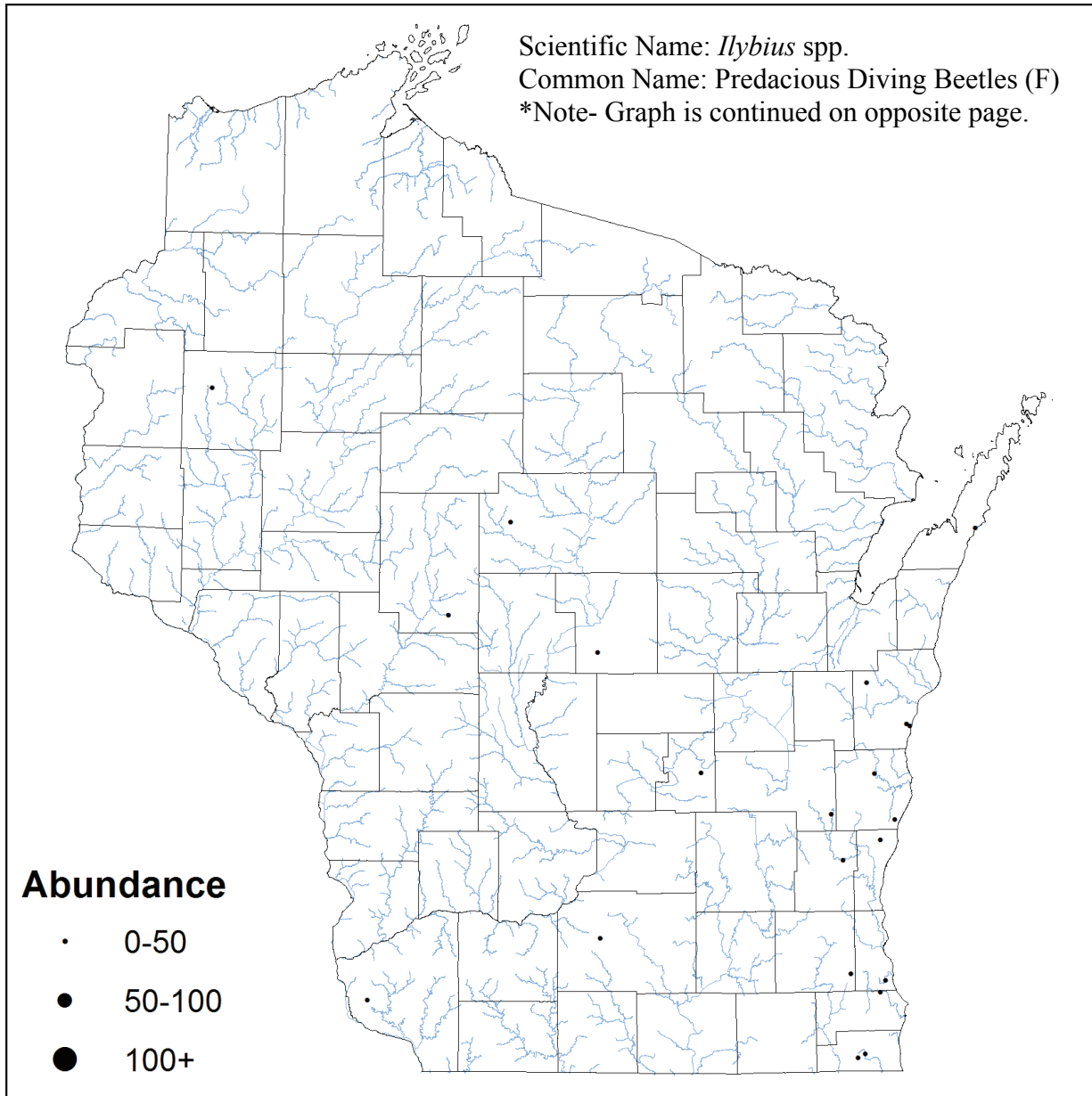


\*Note- Graph is continued on facing page.



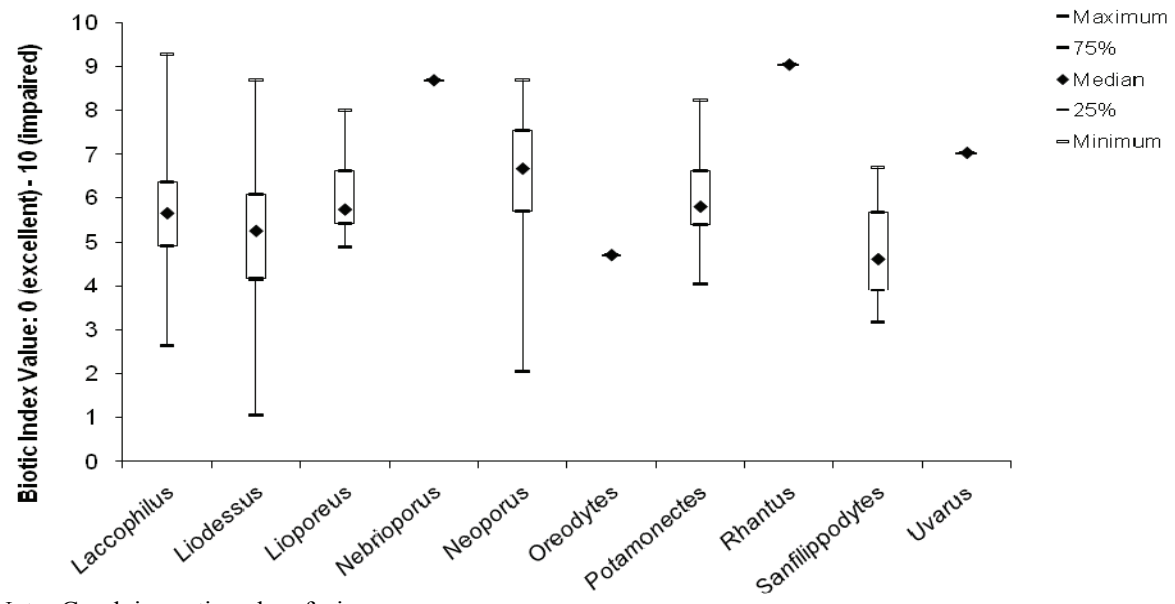
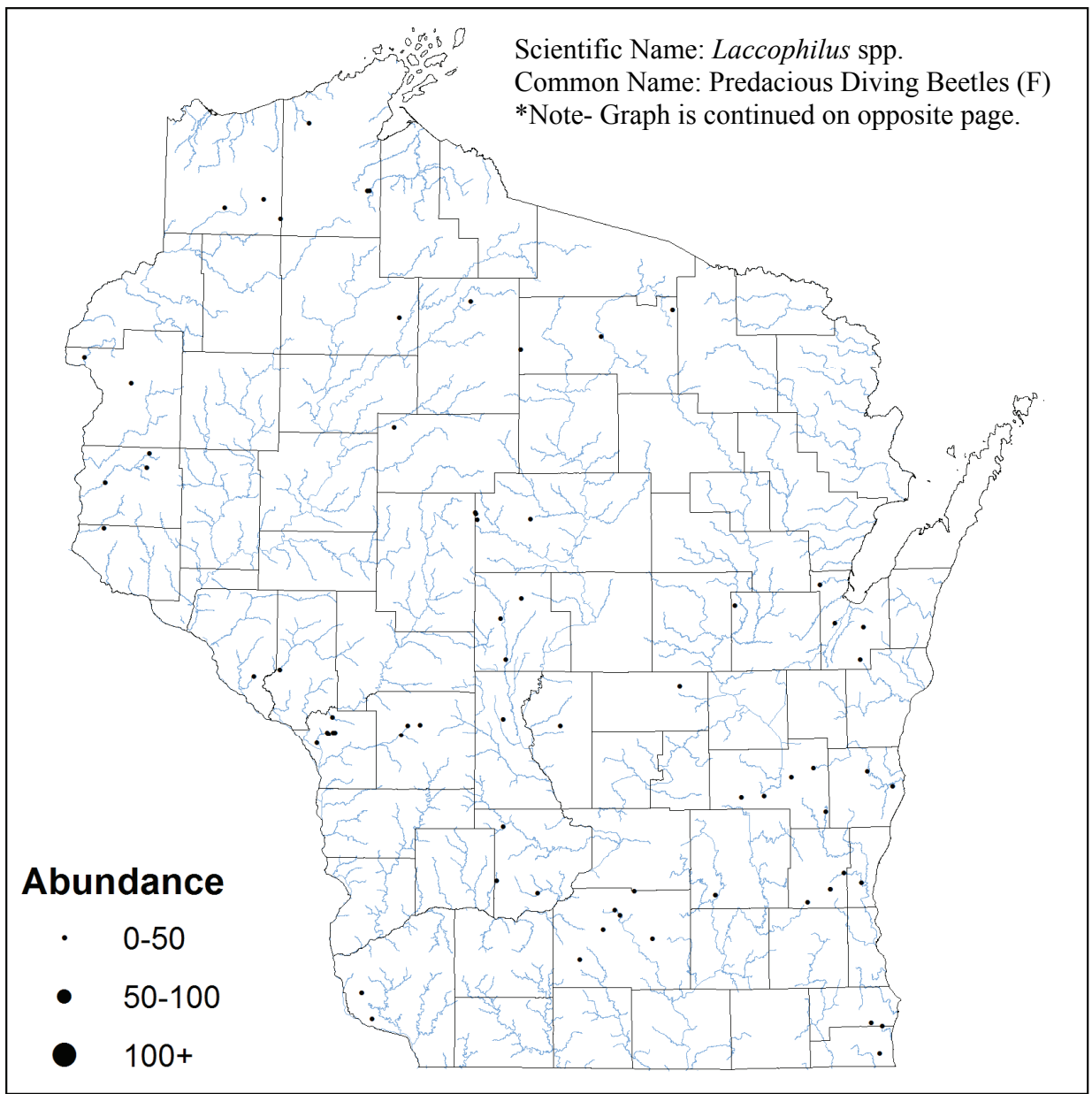
\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae



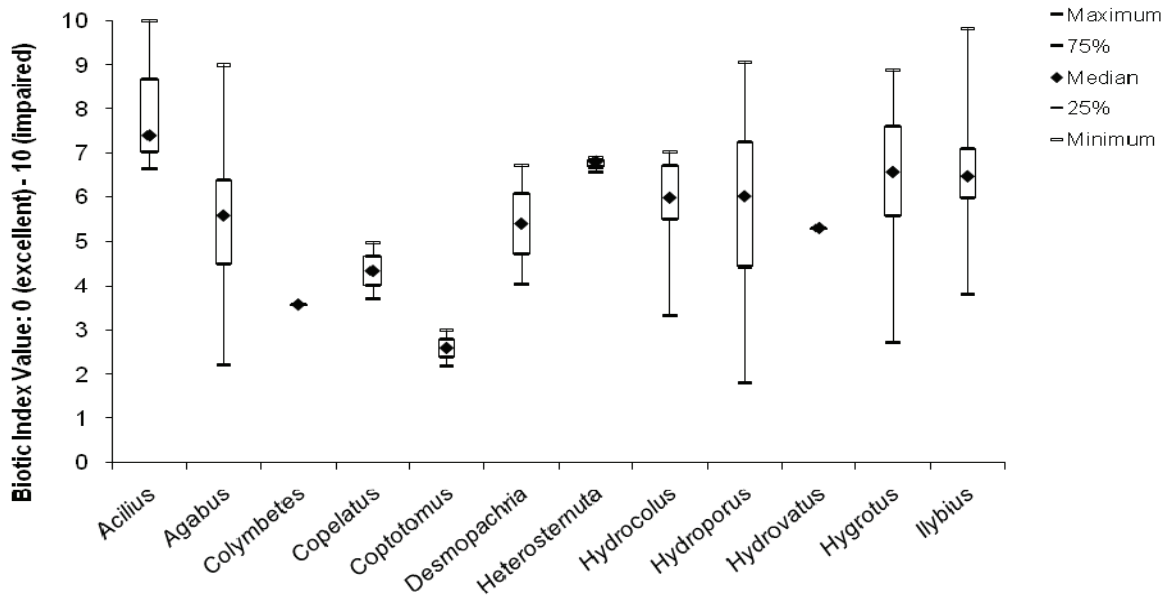
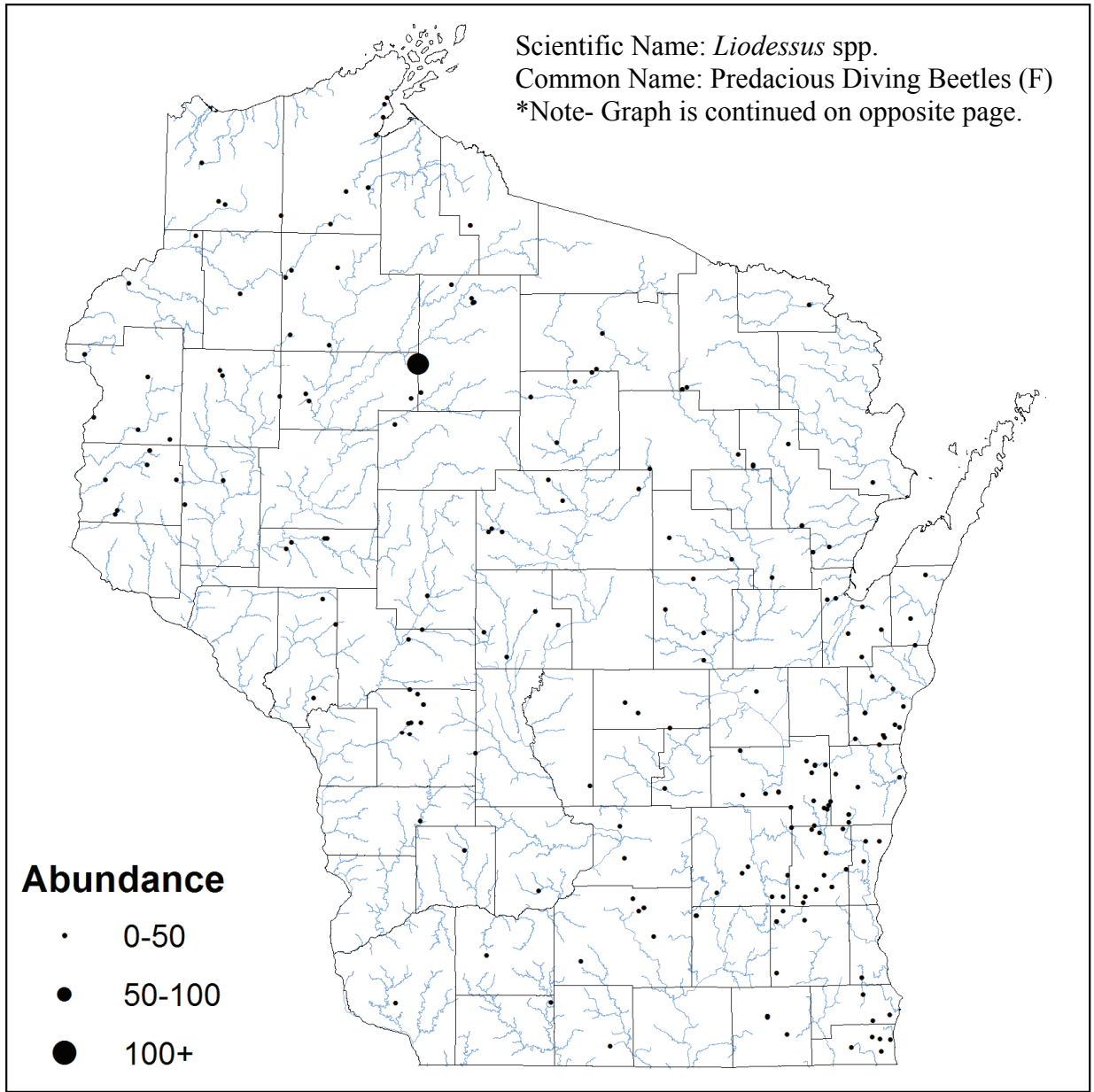
\*Note- Graph is continued on facing page.



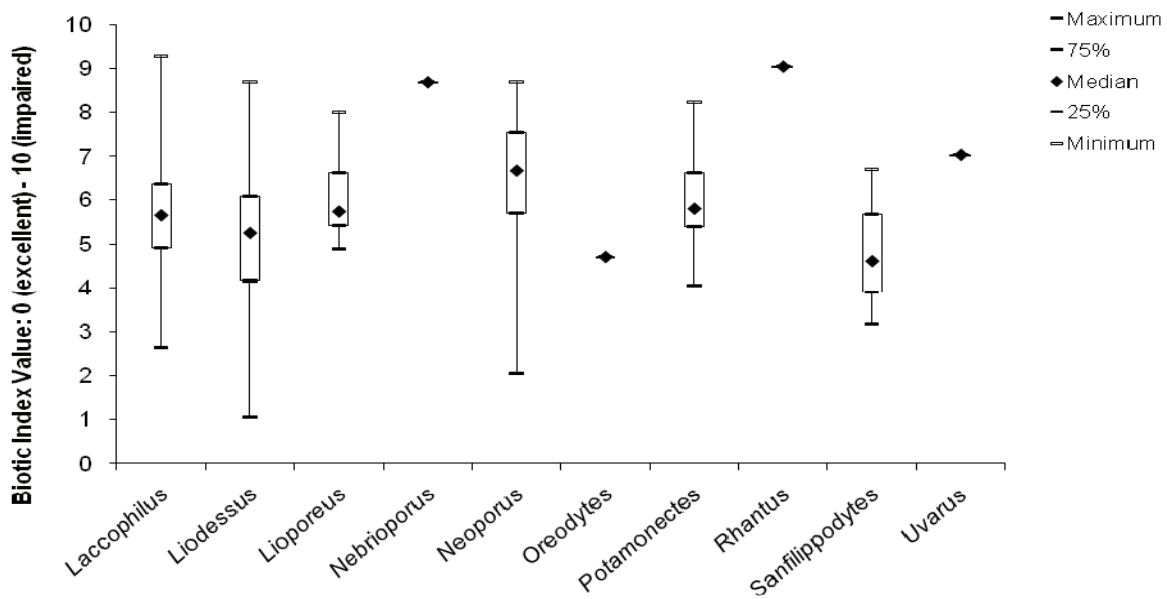
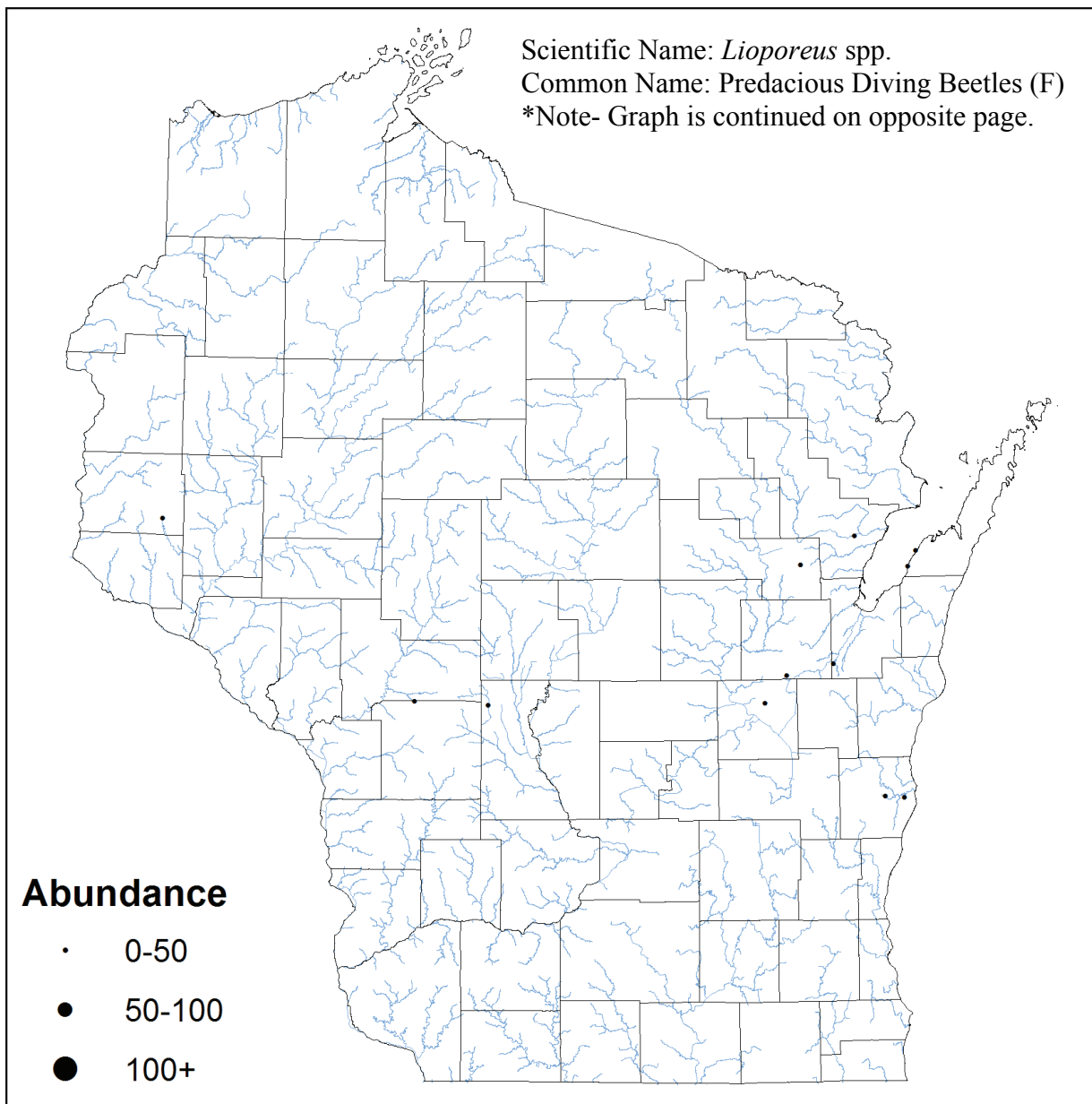


\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae

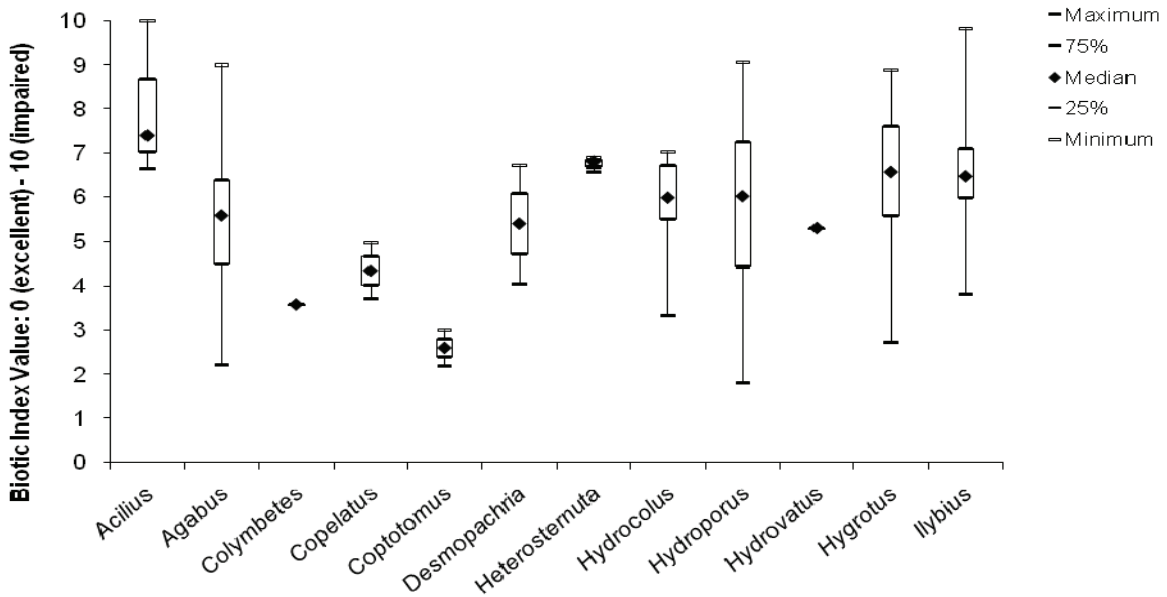
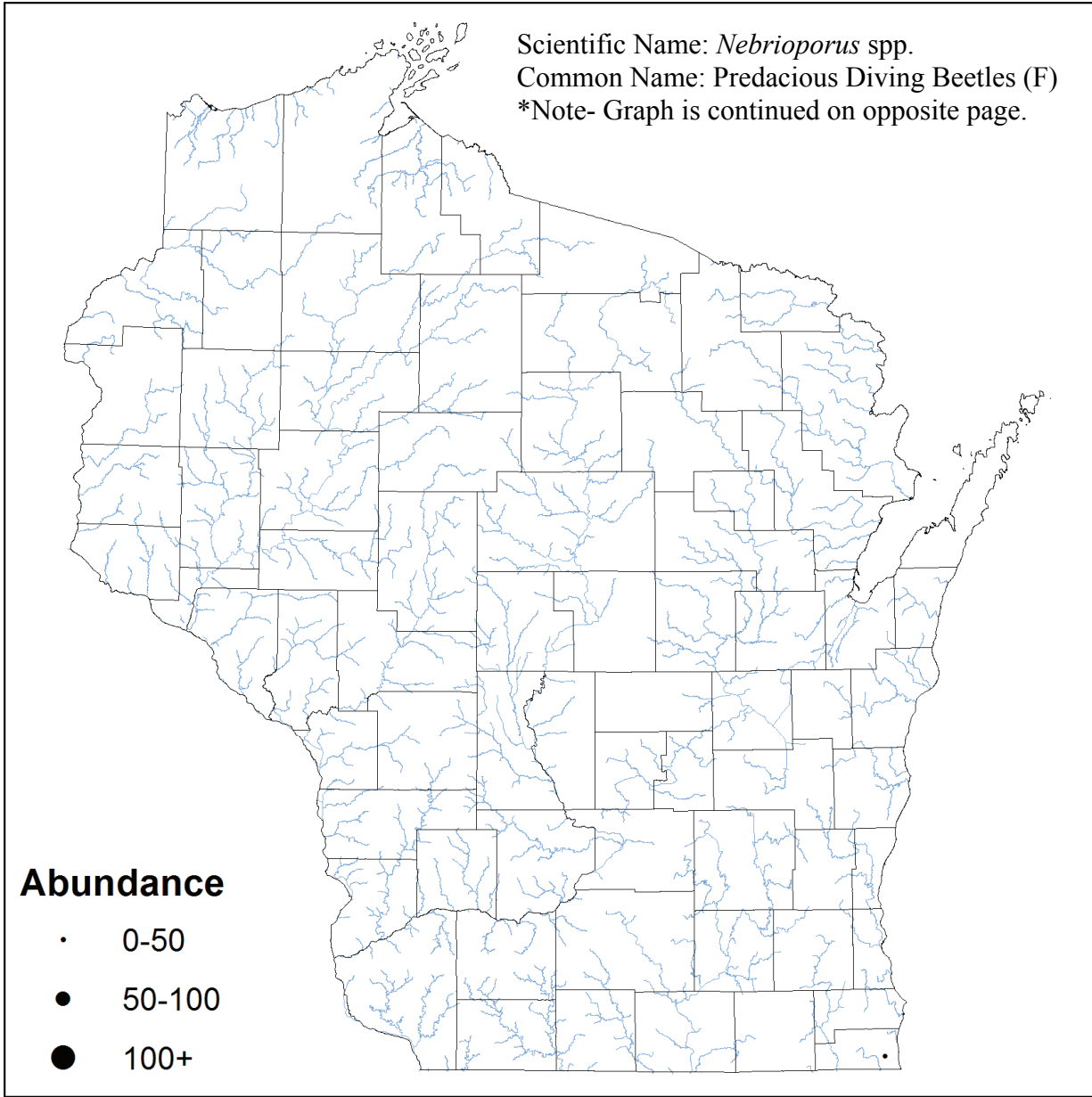


\*Note- Graph is continued on facing page.

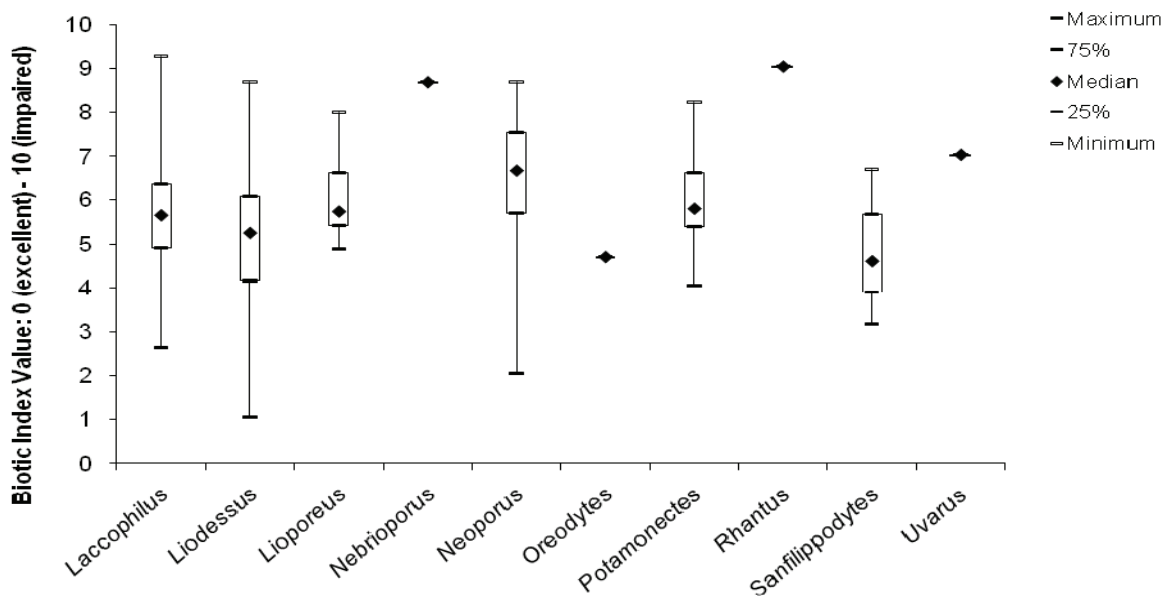
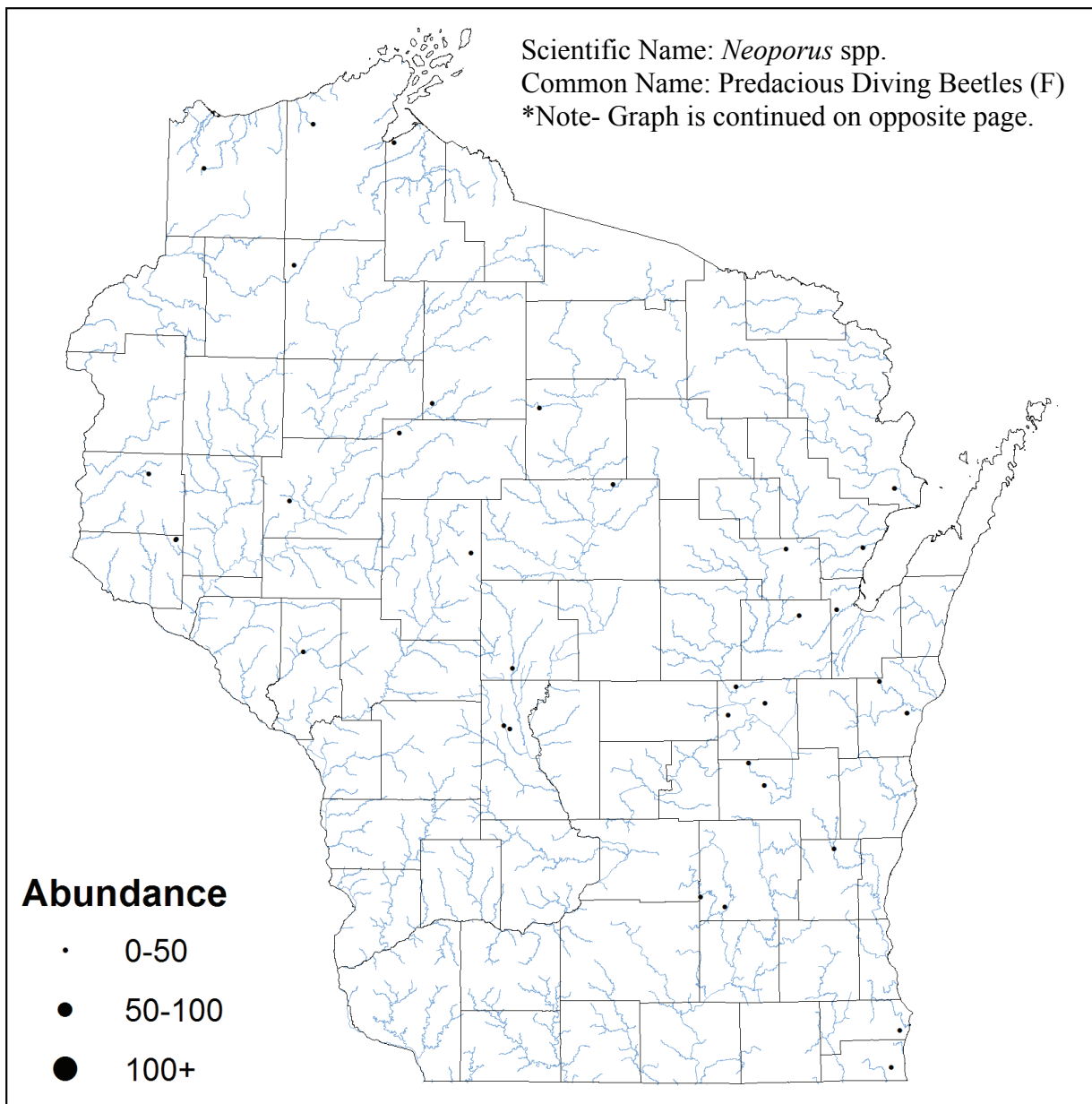


\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae



\*Note- Graph is continued on facing page.



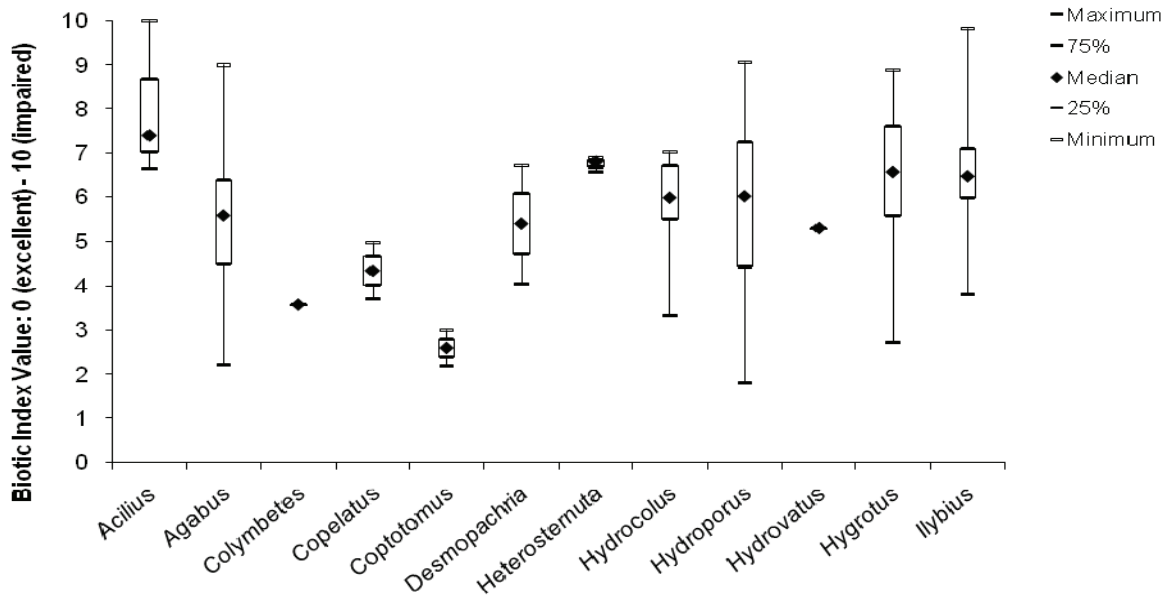
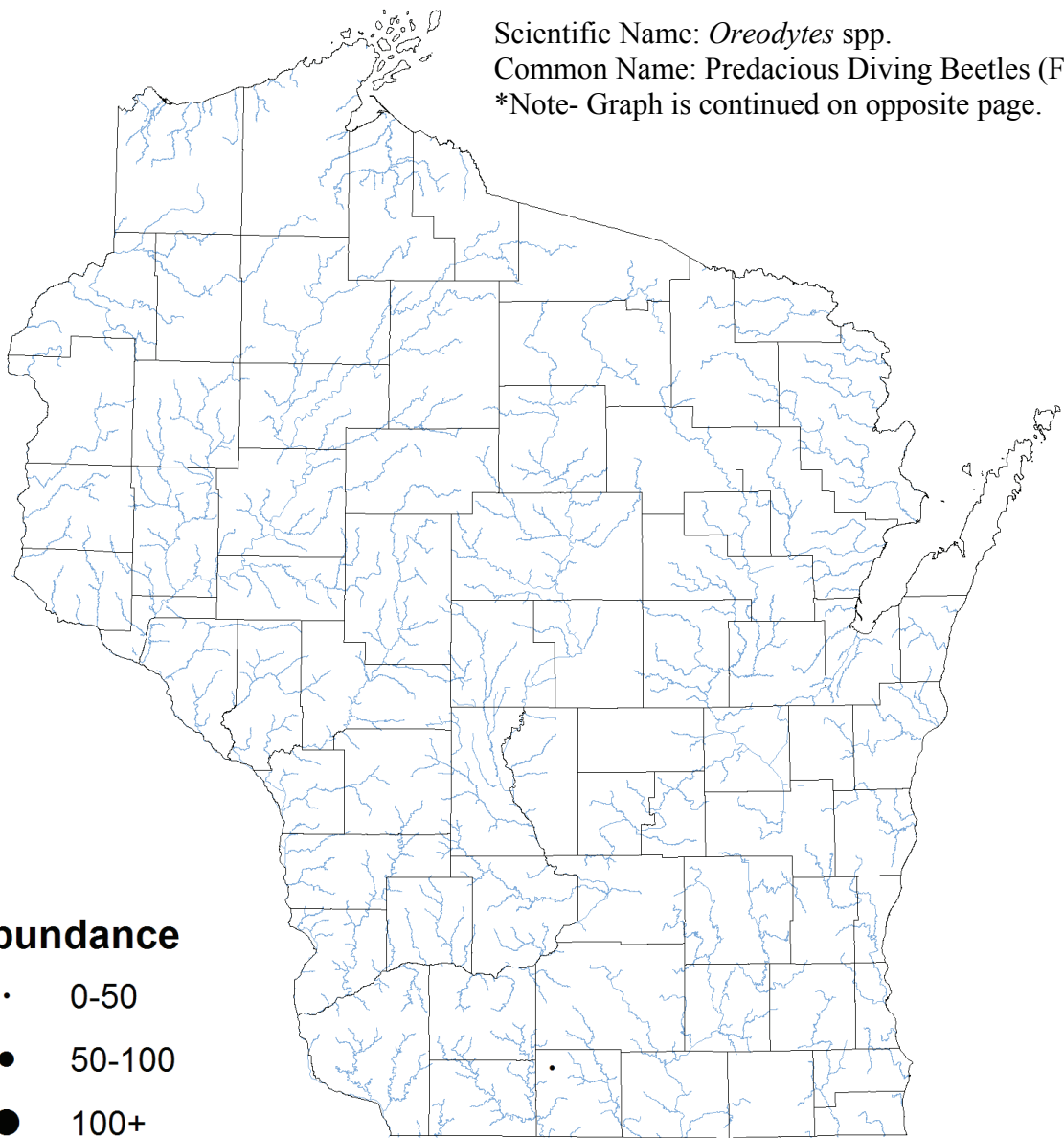
\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae

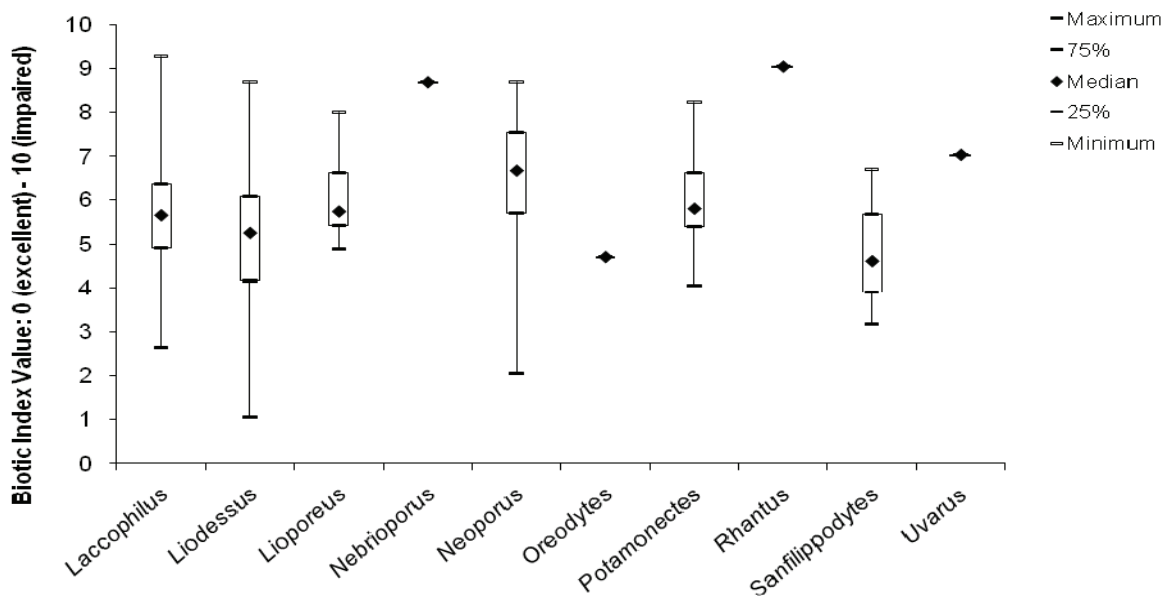
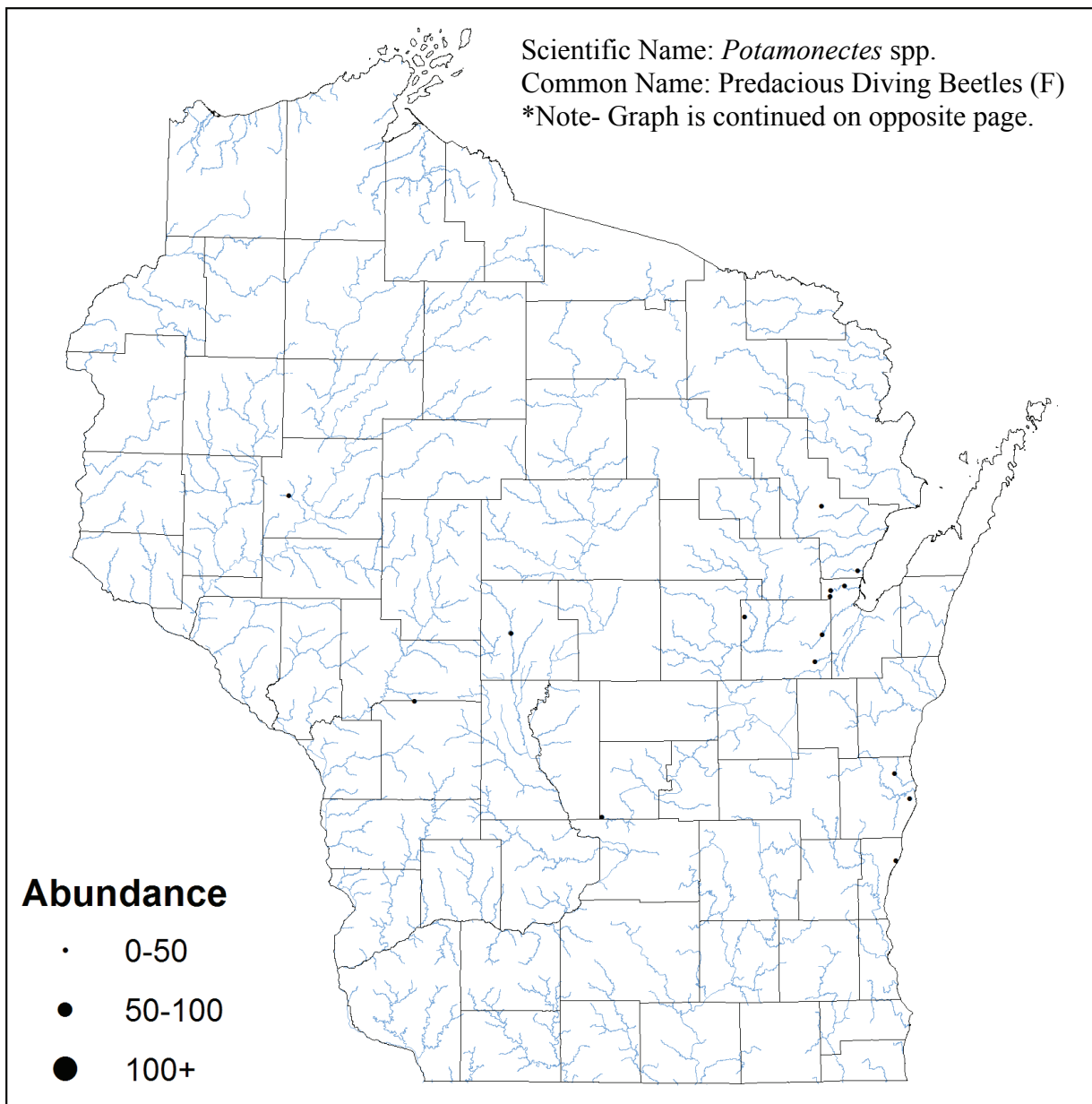
Scientific Name: *Oreodytes* spp.  
 Common Name: Predacious Diving Beetles (F)  
 \*Note- Graph is continued on opposite page.

## Abundance

- 0-50
- 50-100
- 100+

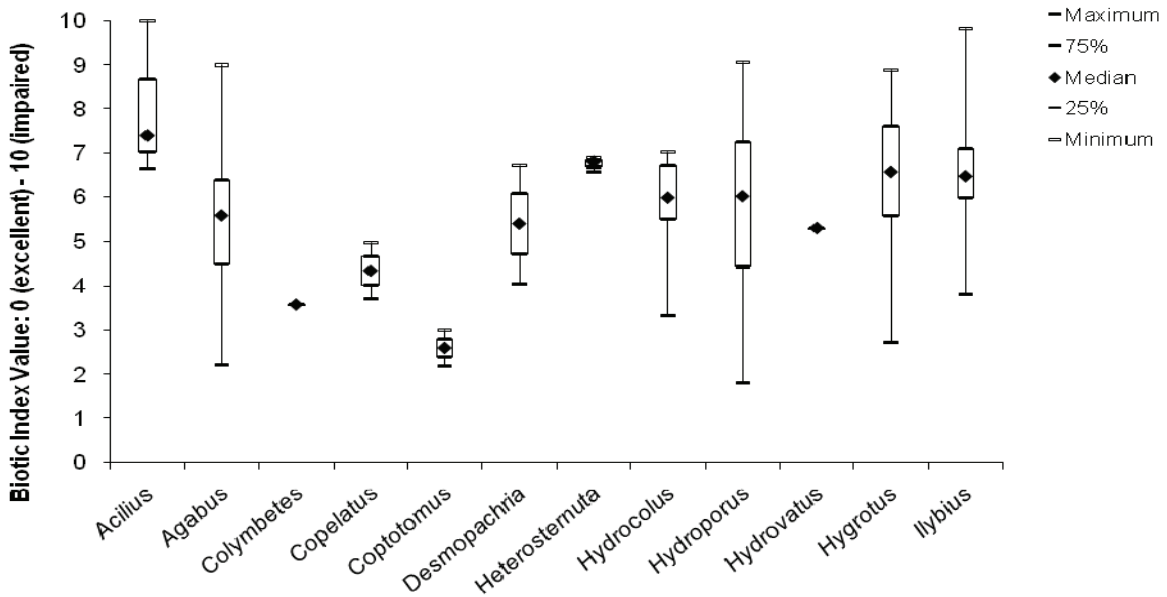
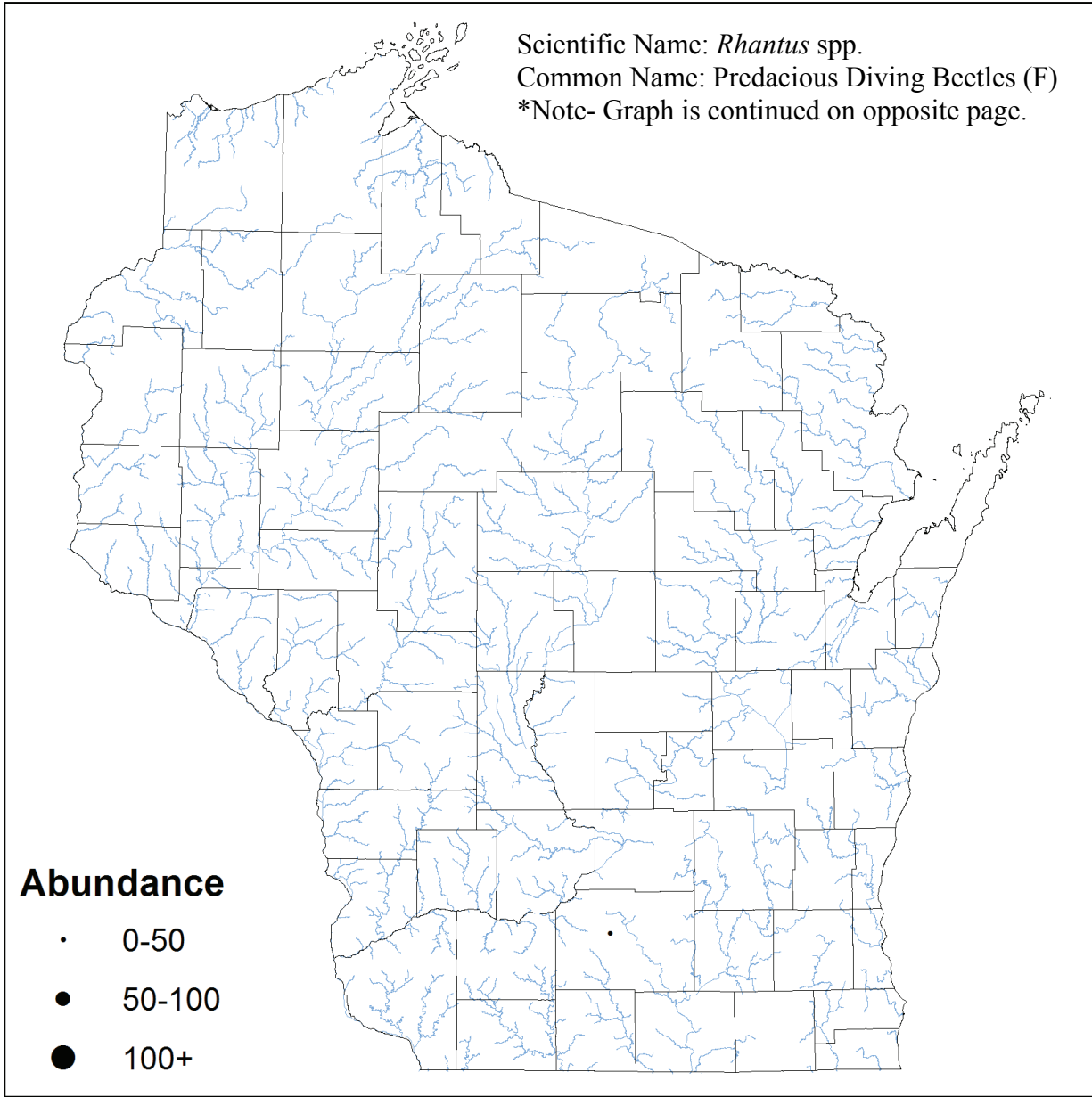


\*Note- Graph is continued on facing page.



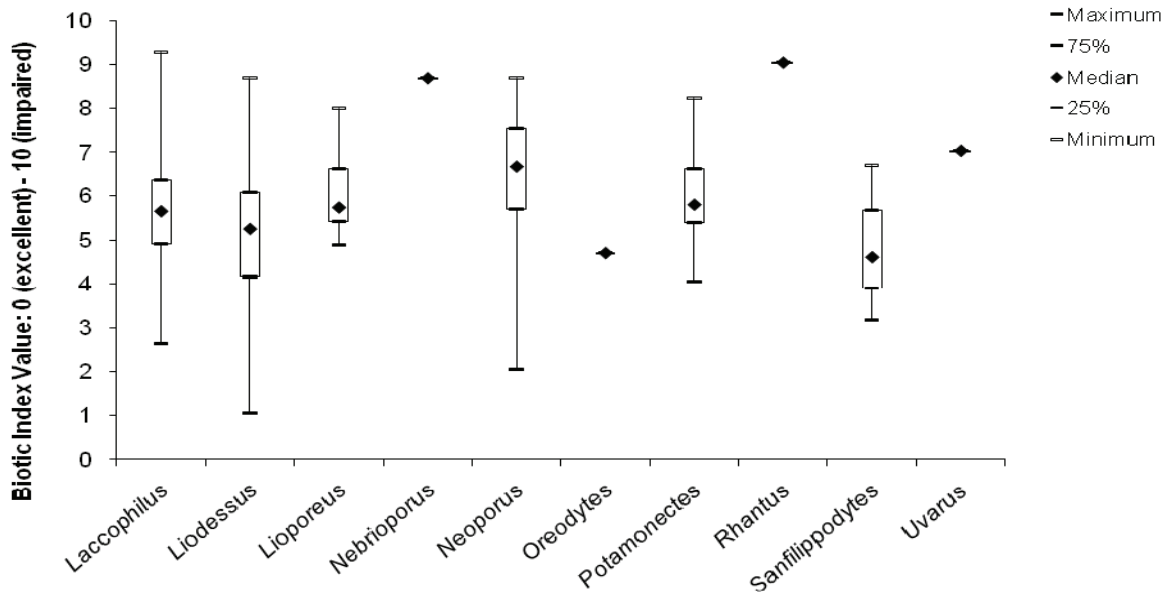
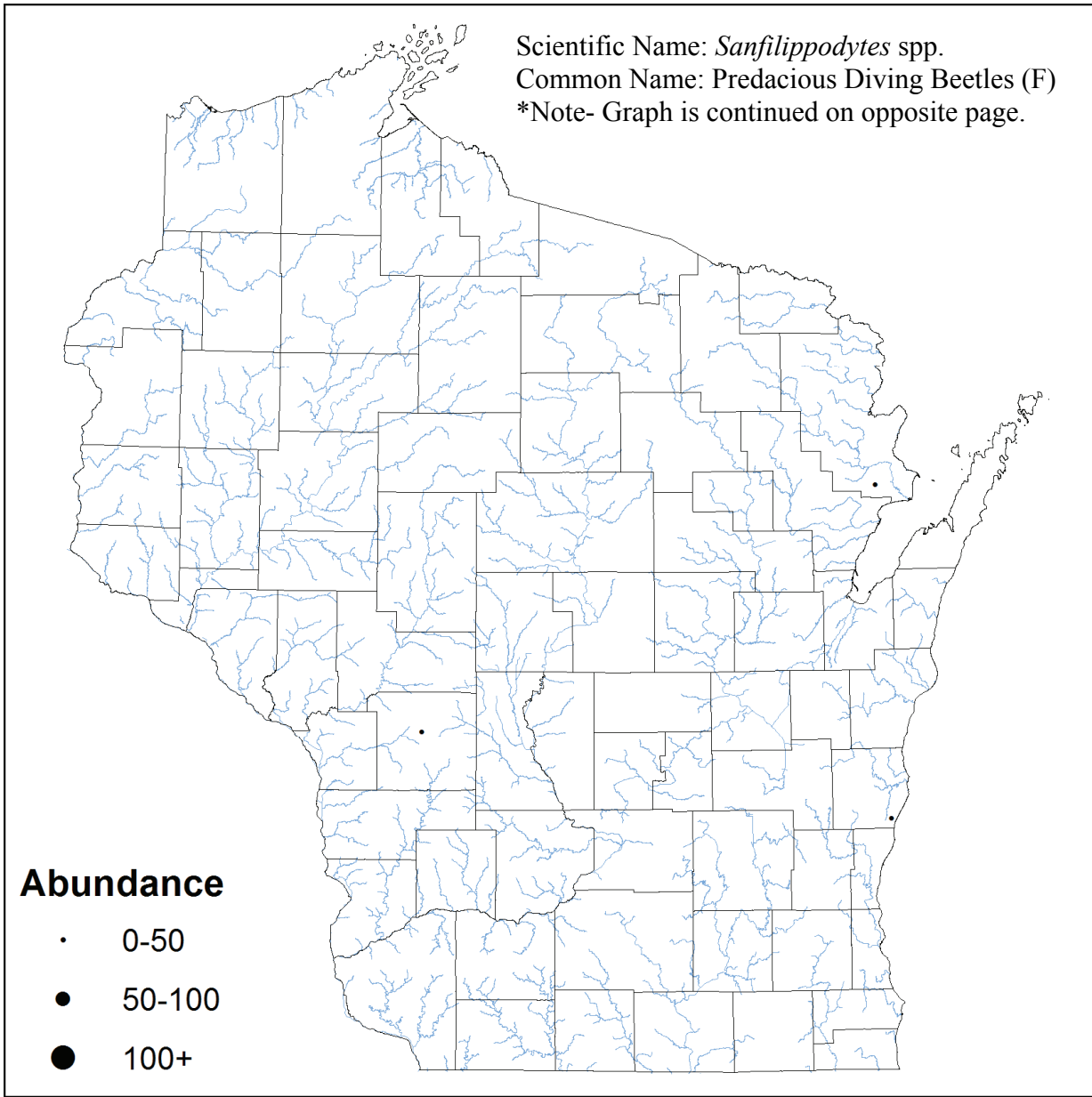
\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae



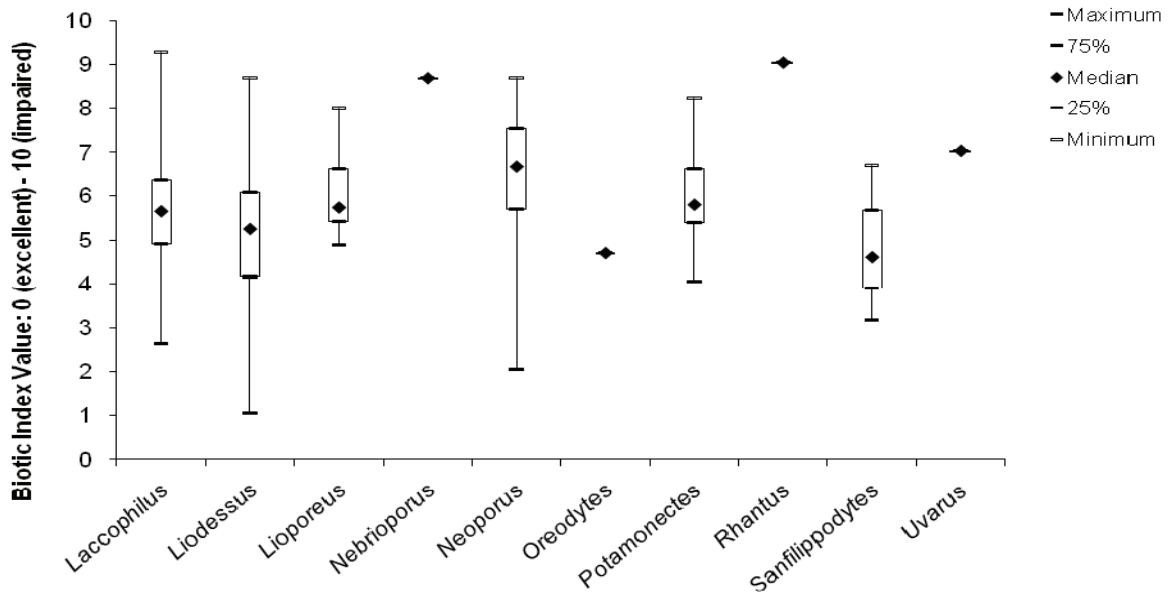
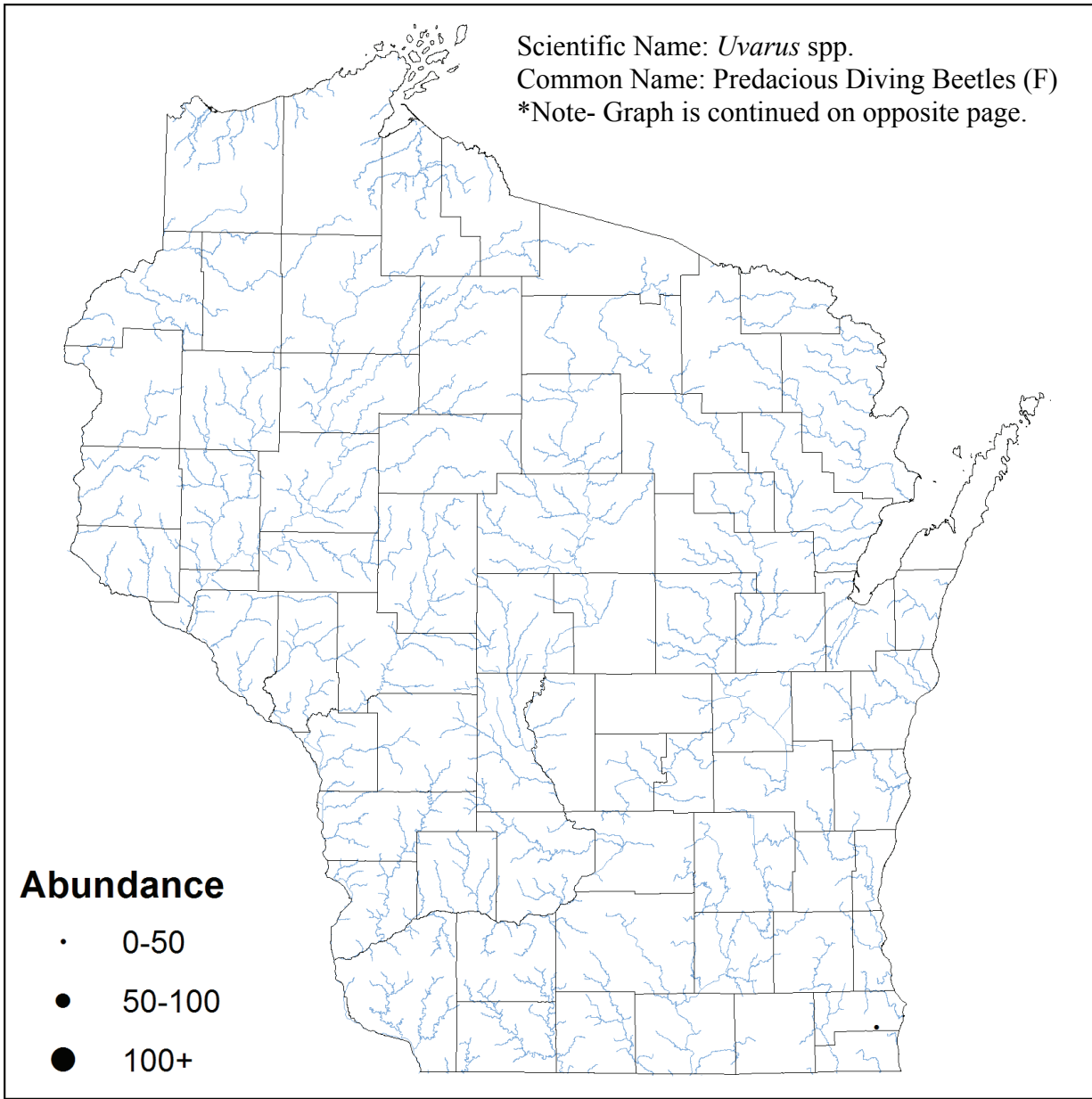
\*Note- Graph is continued on facing page.





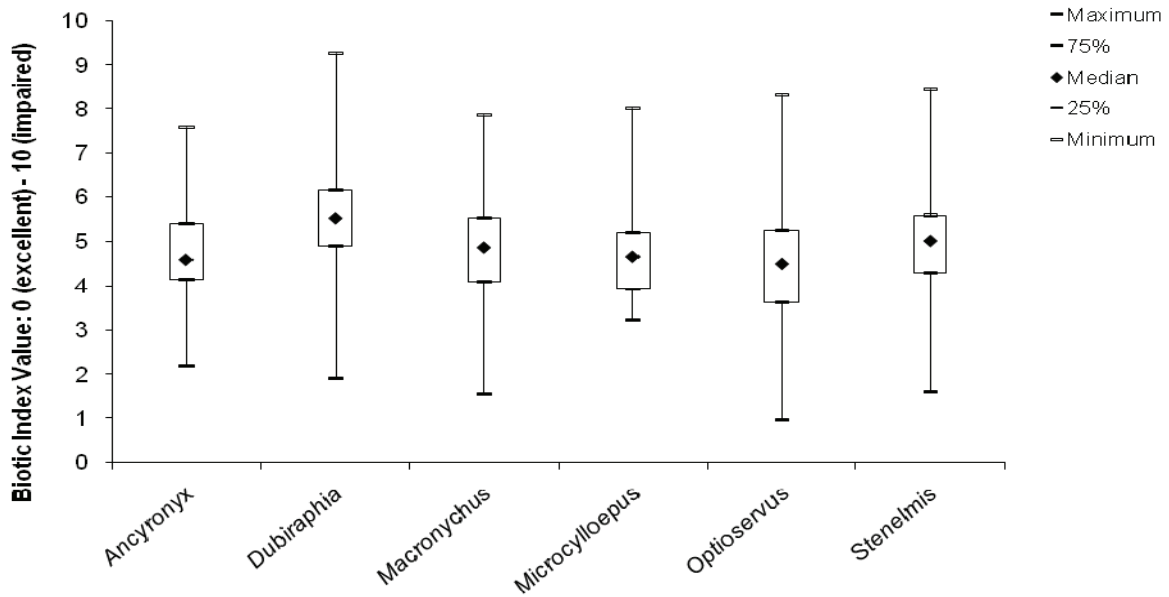
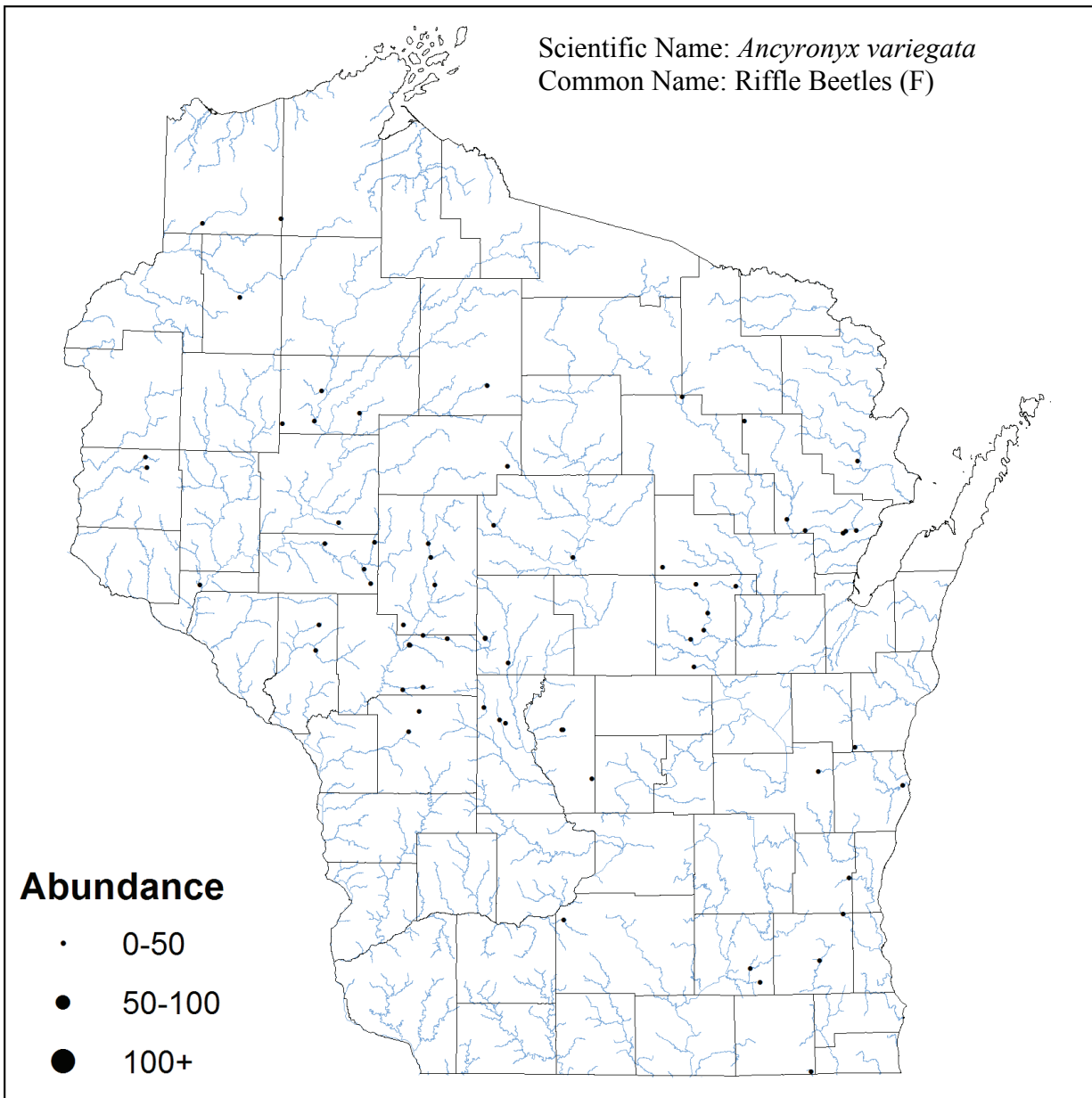
\*Note- Graph is continued on facing page.

# Coleoptera Dytiscidae



\*Note- Graph is continued on facing page.

Scientific Name: *Ancyronyx variegata*  
 Common Name: Riffle Beetles (F)

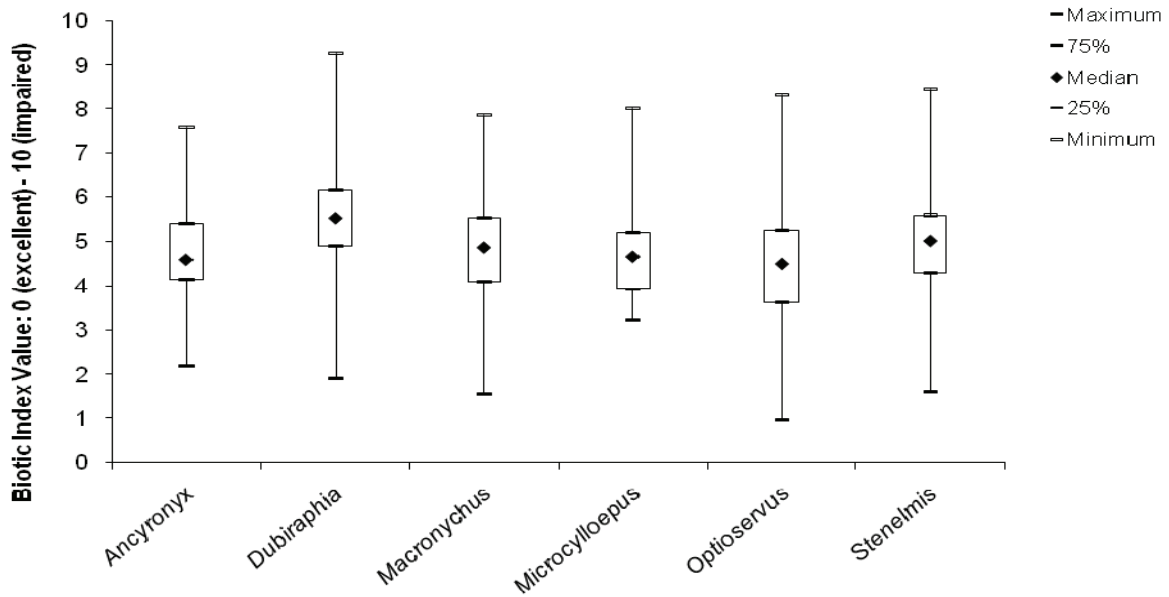
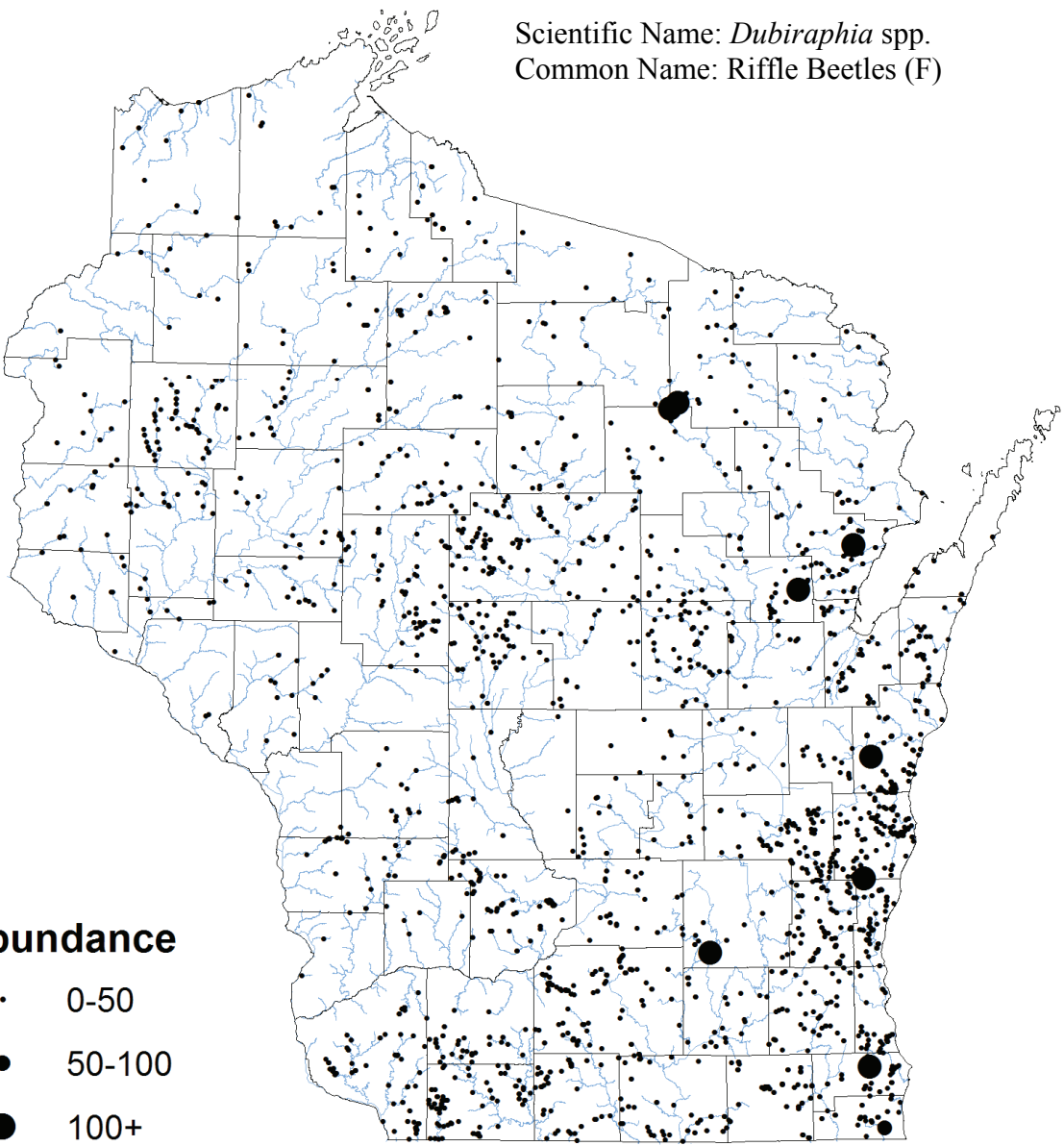


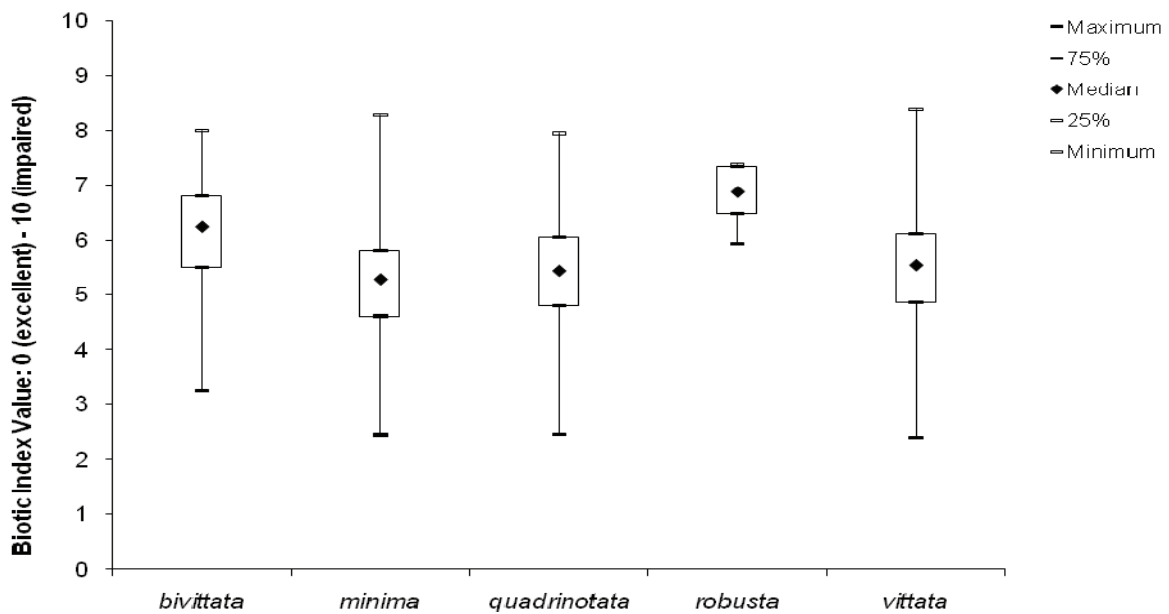
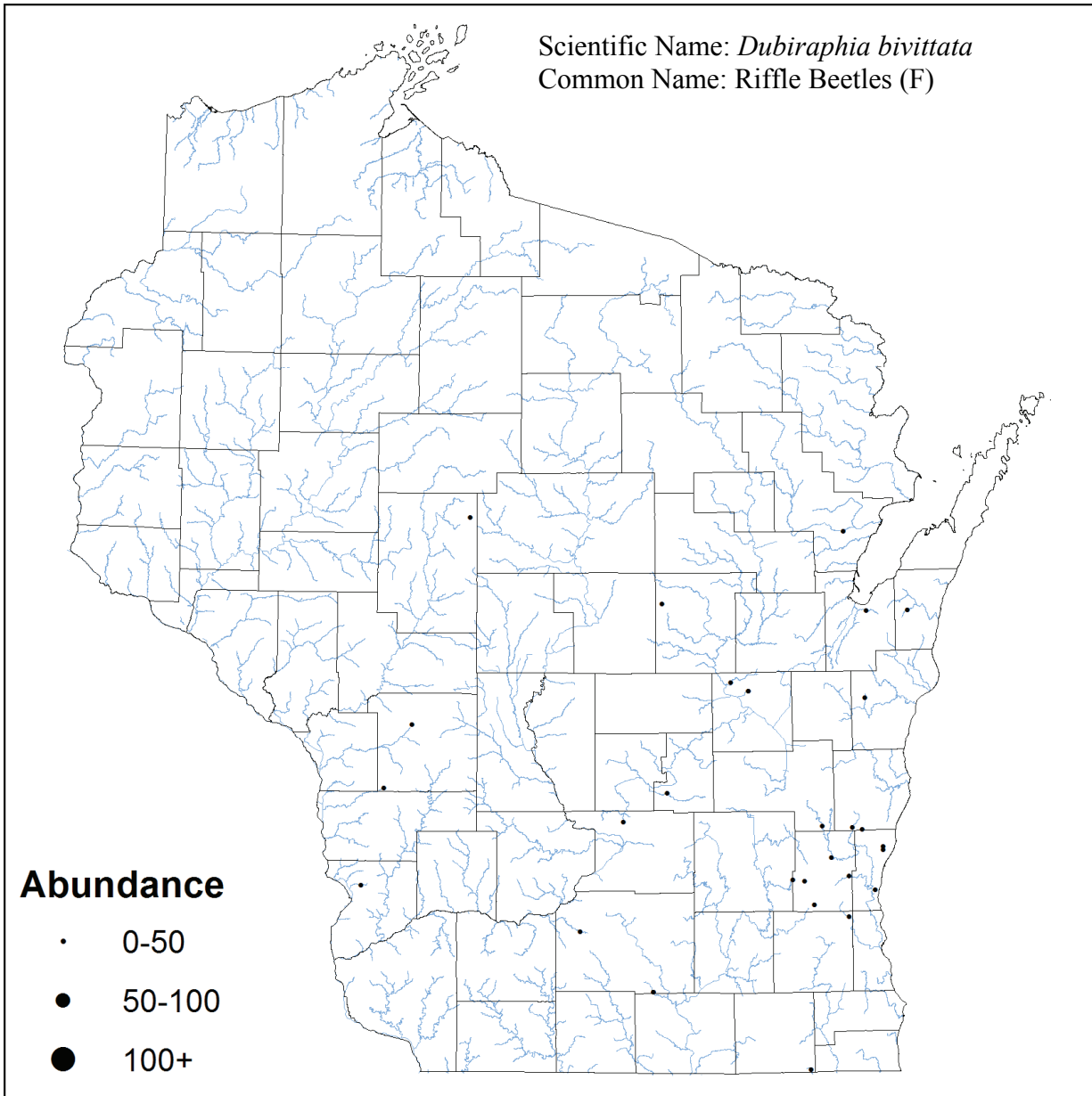
# Coleoptera Elmidae

Scientific Name: *Dubiraphia* spp.  
Common Name: Riffle Beetles (F)

## Abundance

- 0-50
- 50-100
- 100+



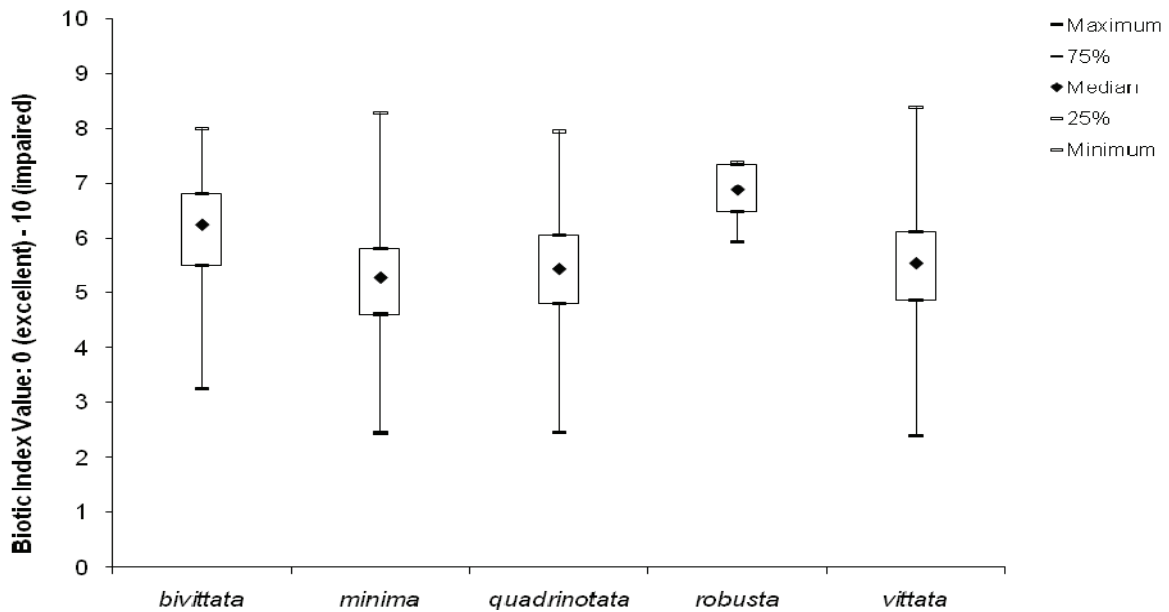
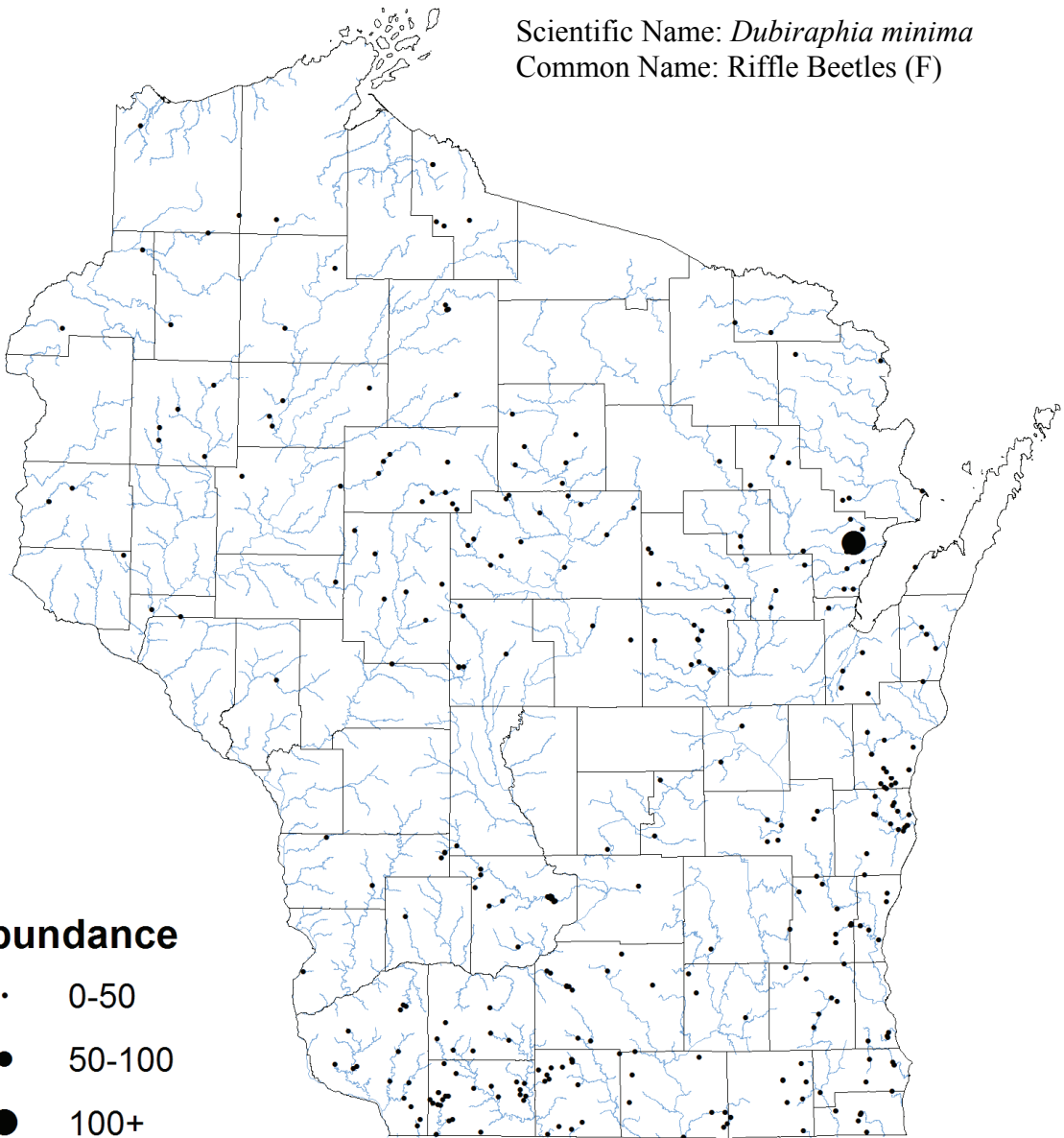


# Coleoptera Elmidae

Scientific Name: *Dubiraphia minima*  
 Common Name: Riffle Beetles (F)

## Abundance

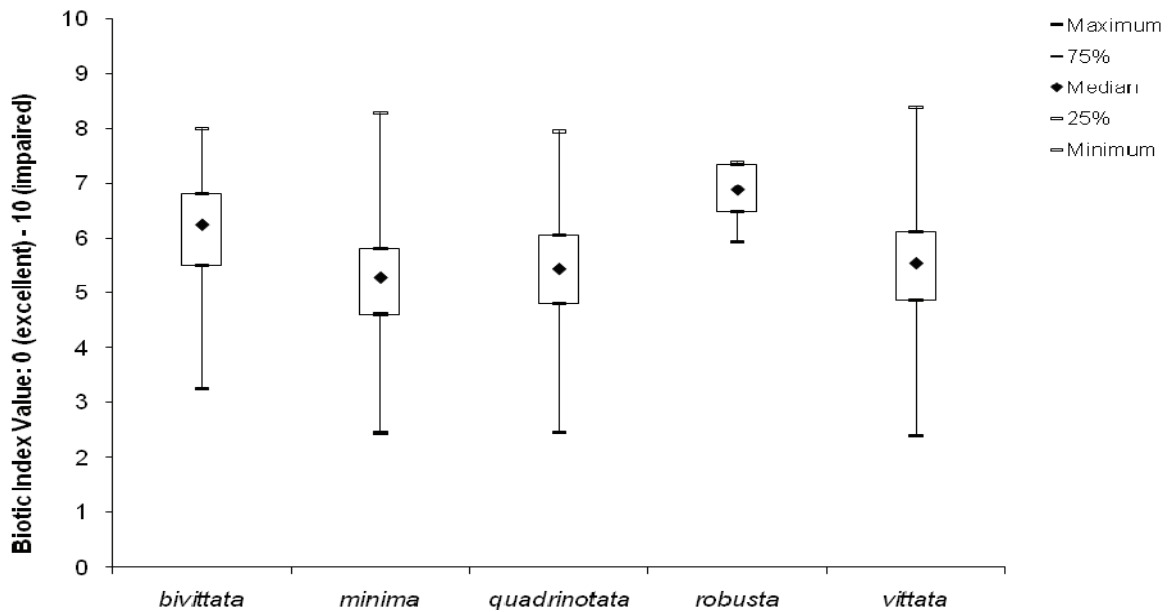
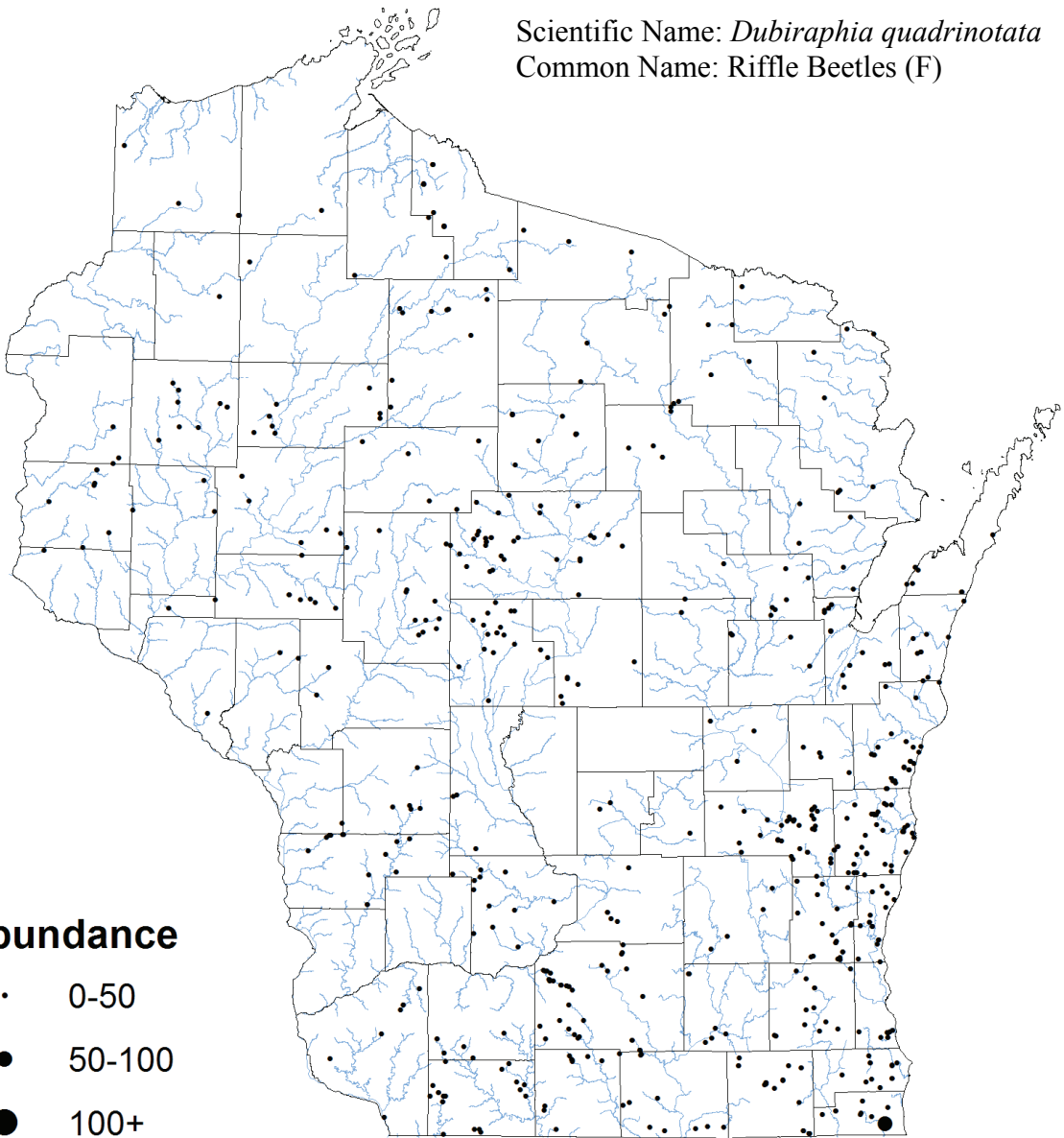
- 0-50
- 50-100
- 100+



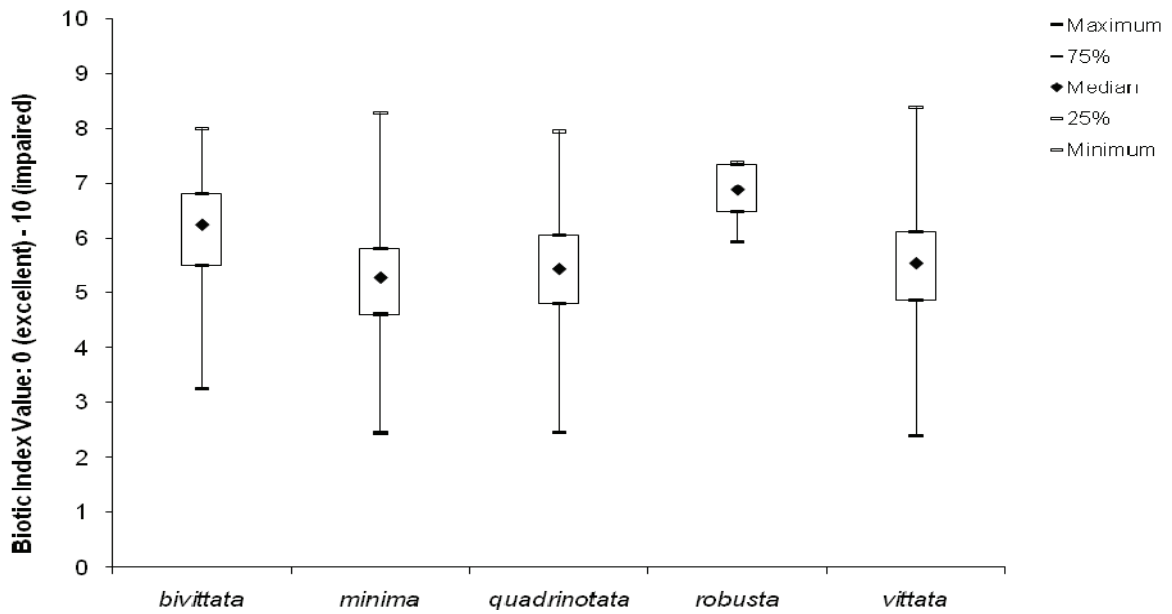
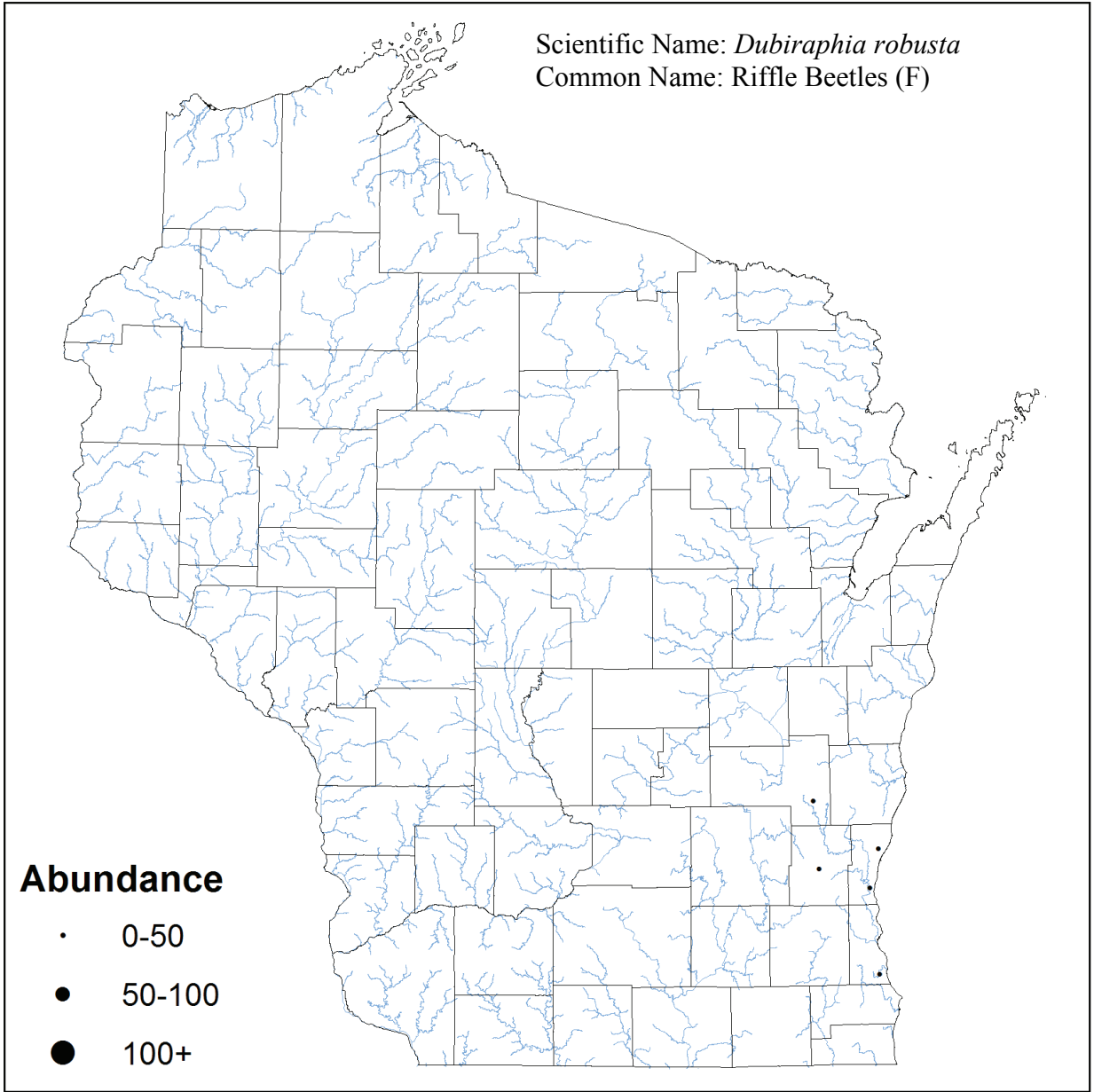
Scientific Name: *Dubiraphia quadrinotata*  
 Common Name: Riffle Beetles (F)

**Abundance**

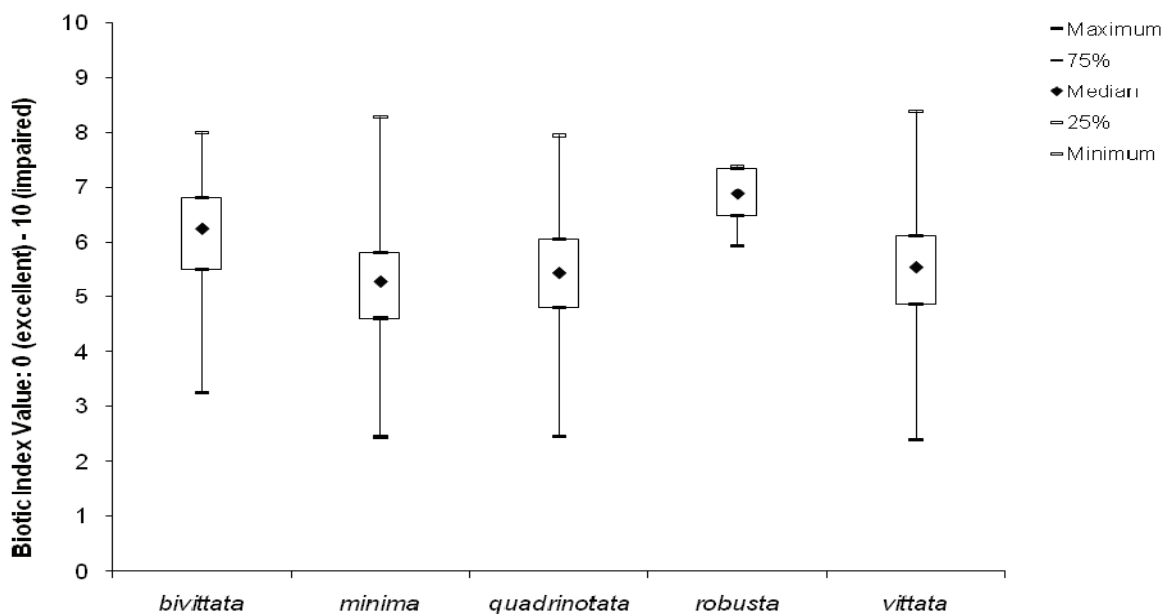
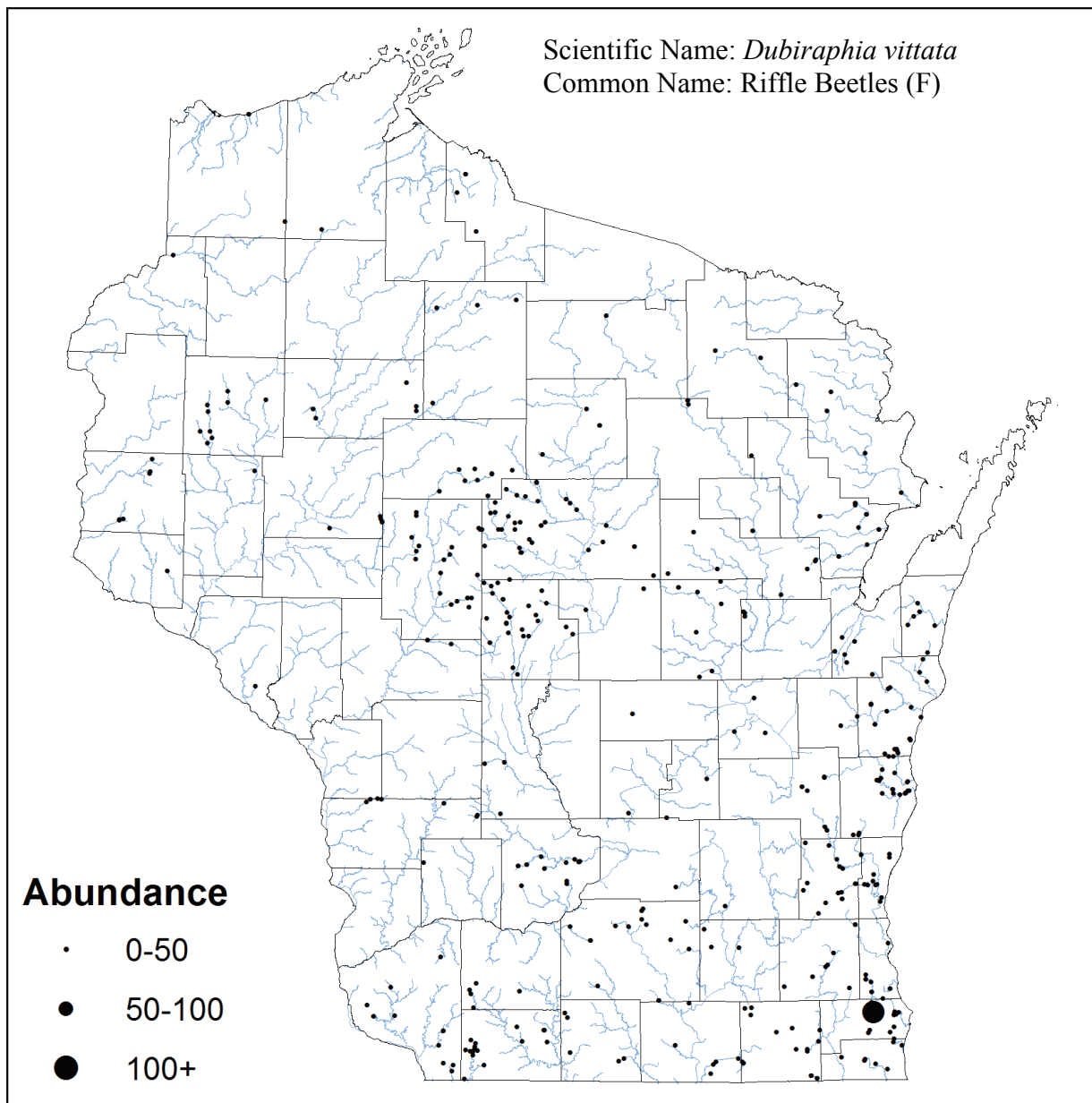
- 0-50
- 50-100
- 100+



# Coleoptera Elmidae





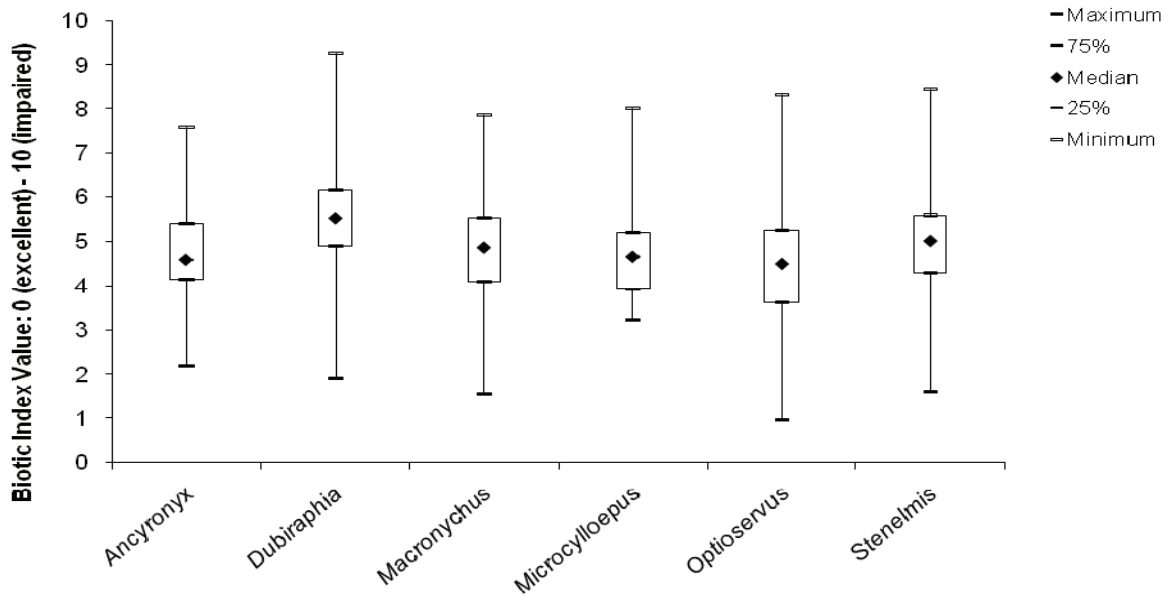
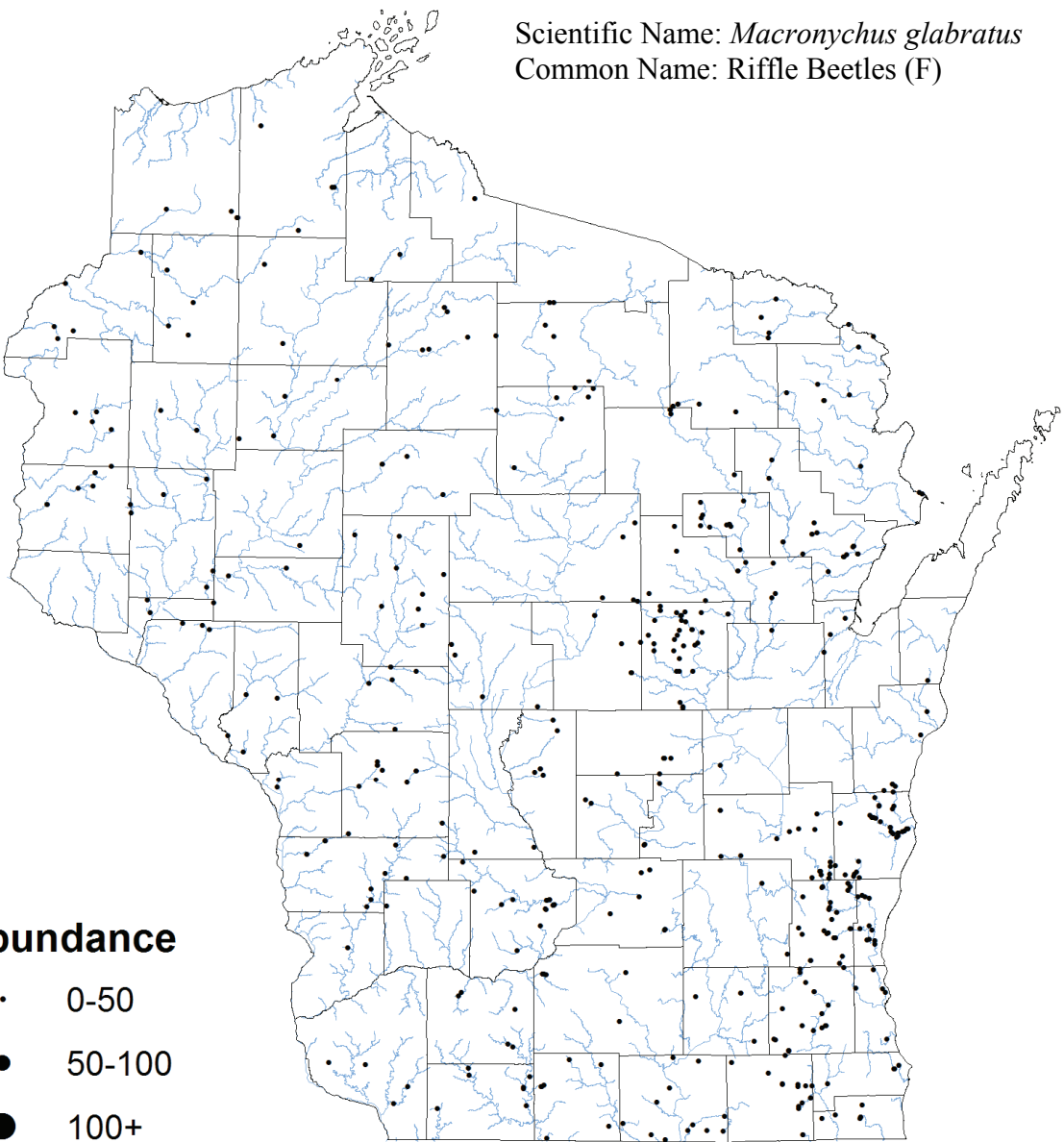


# Coleoptera Elmidae

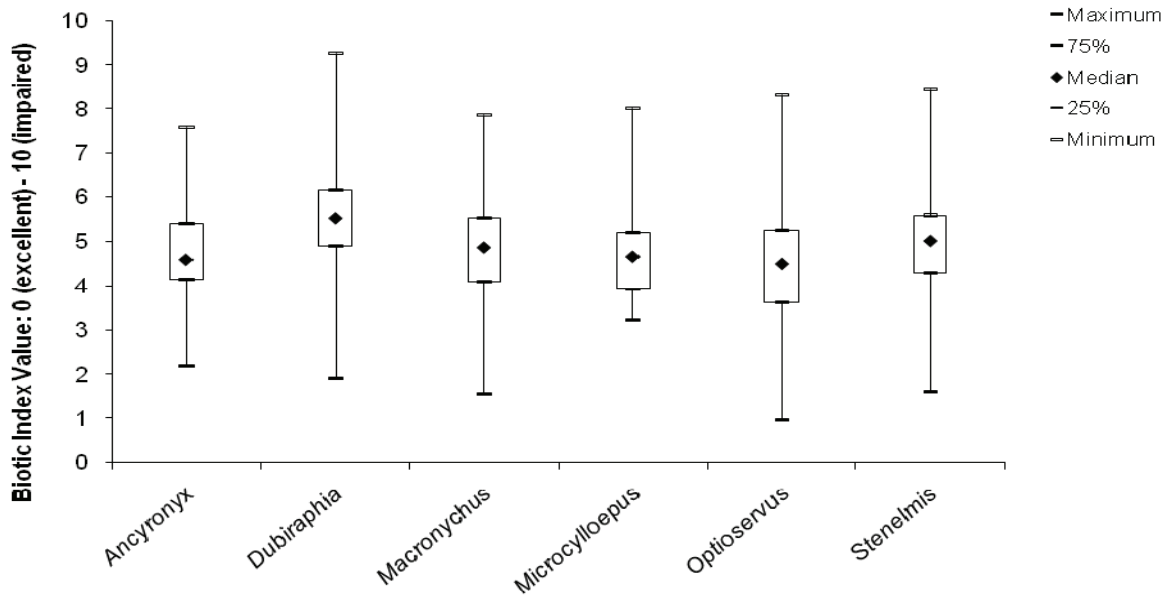
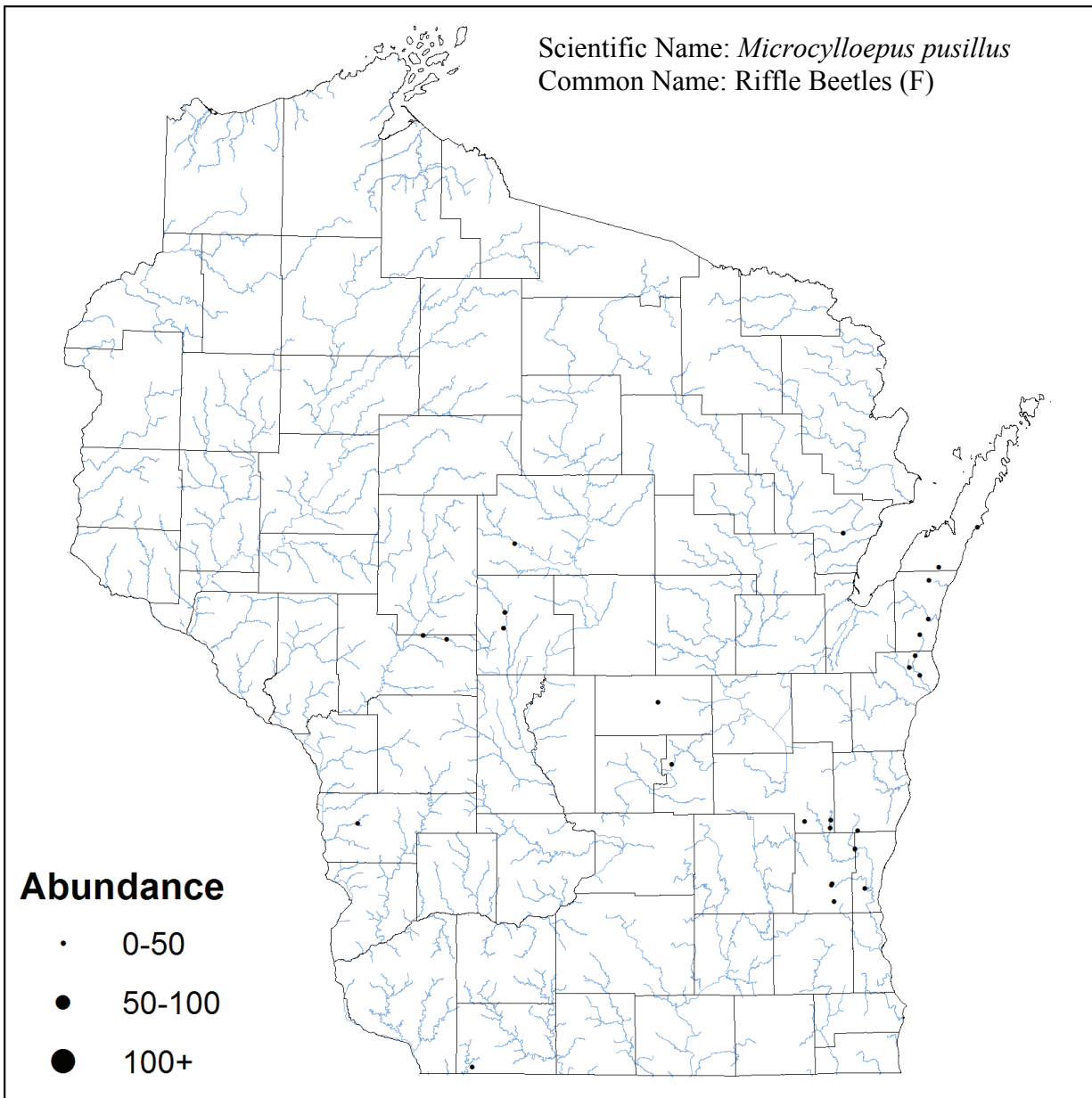
Scientific Name: *Macronychus glabratus*  
 Common Name: Riffle Beetles (F)

## Abundance

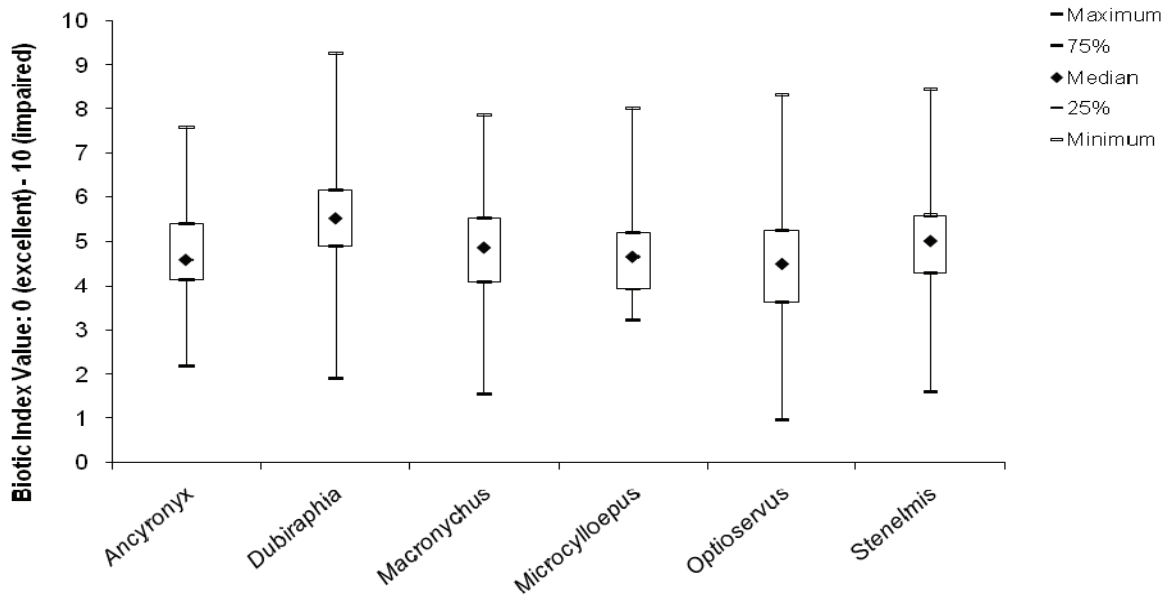
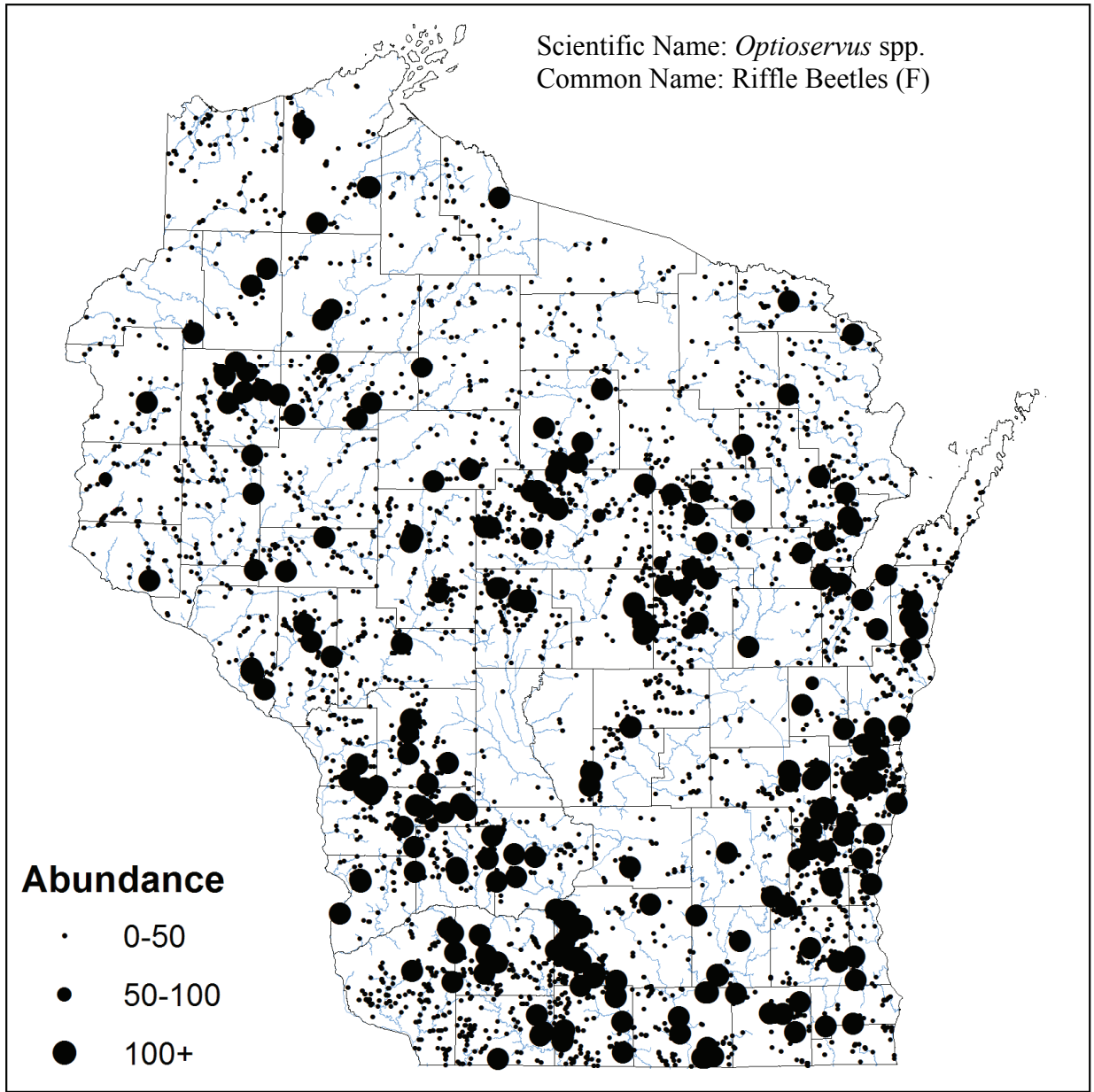
- 0-50
- 50-100
- 100+

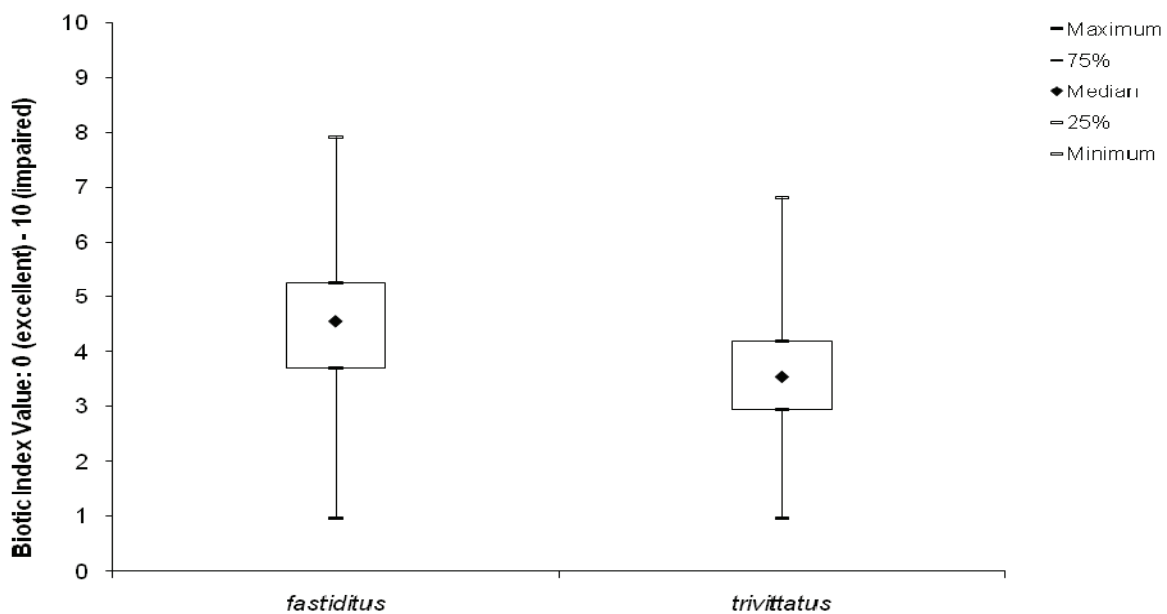
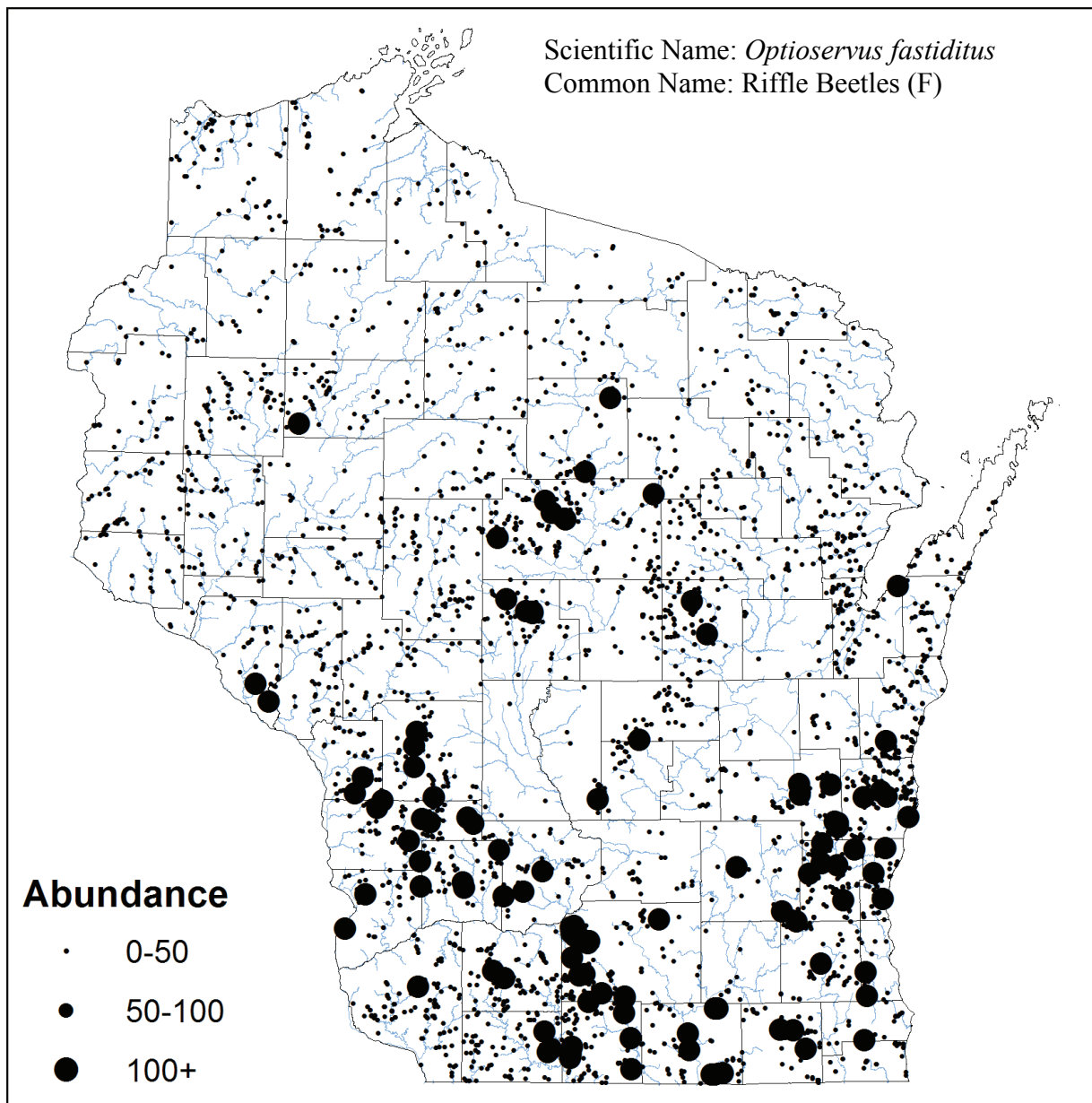


Scientific Name: *Microcylloepus pusillus*  
 Common Name: Riffle Beetles (F)

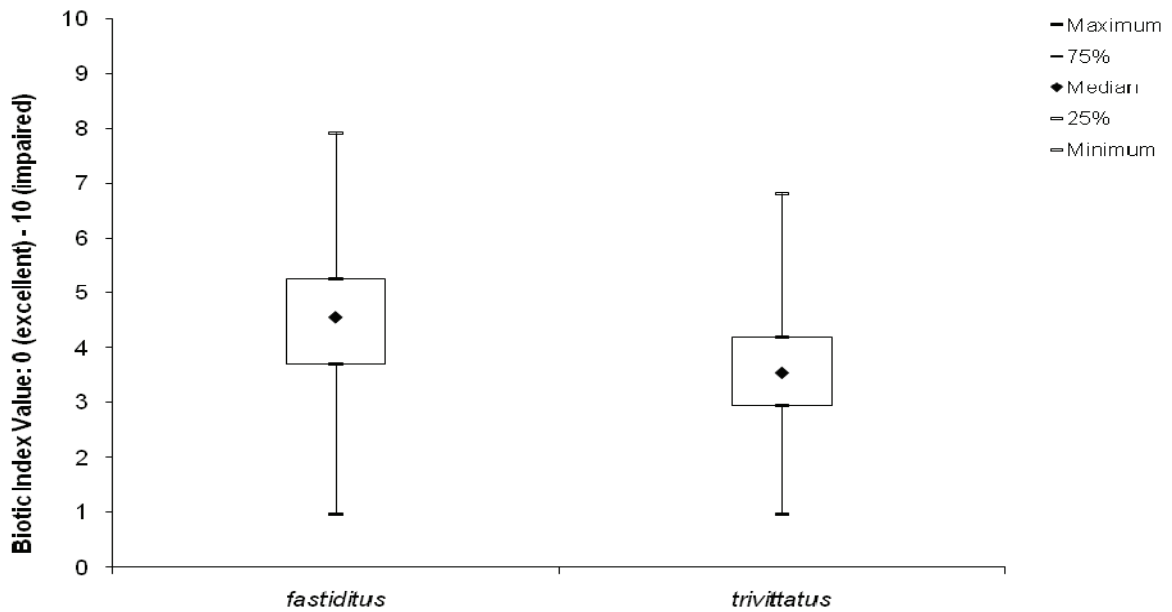
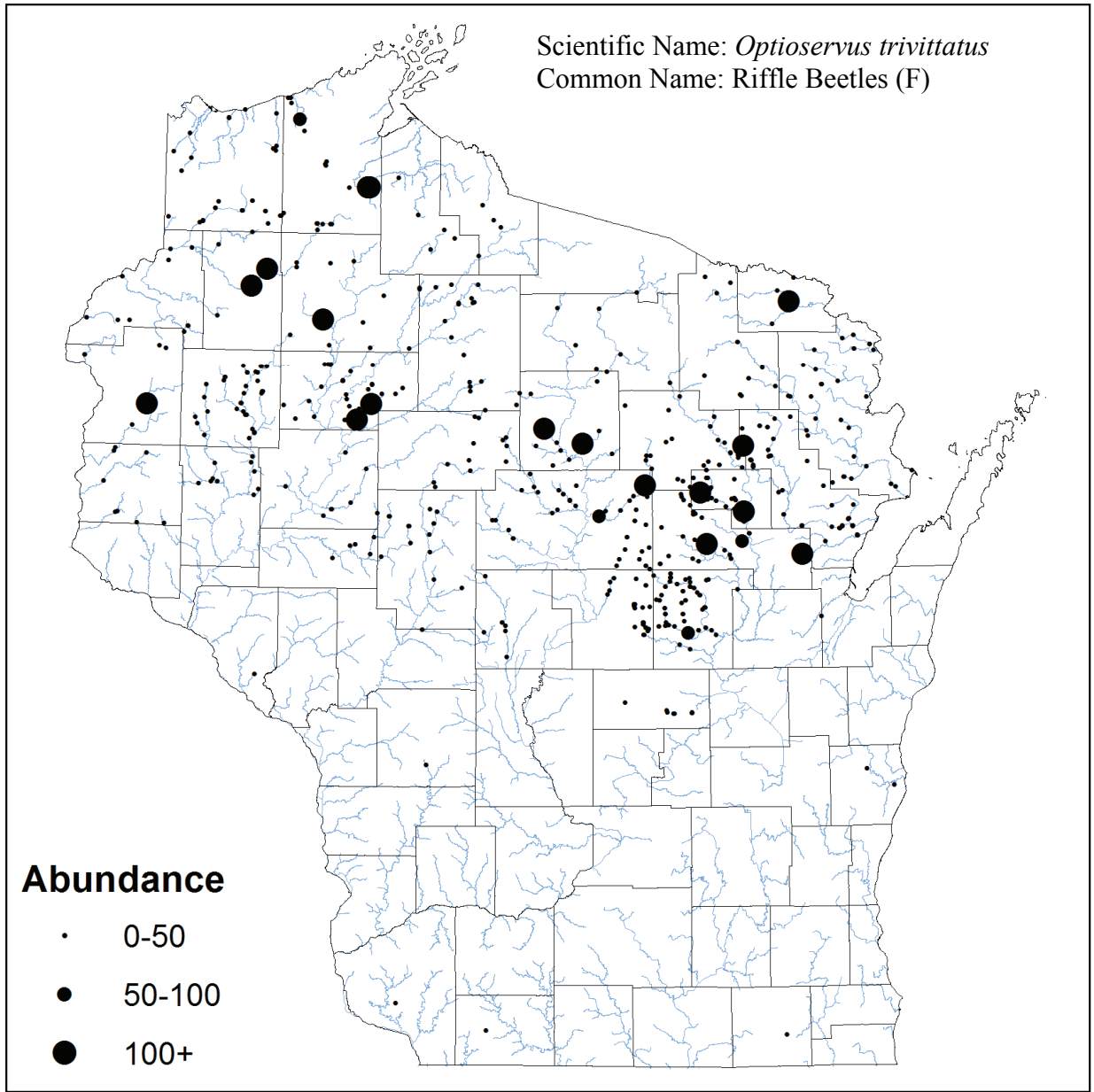


# Coleoptera Elmidae





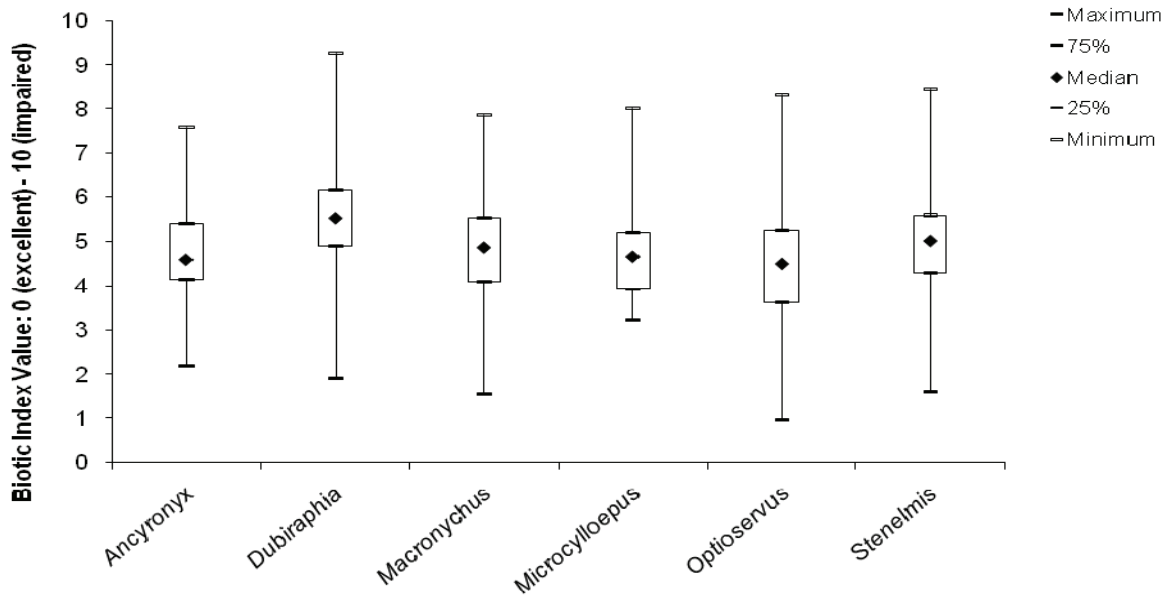
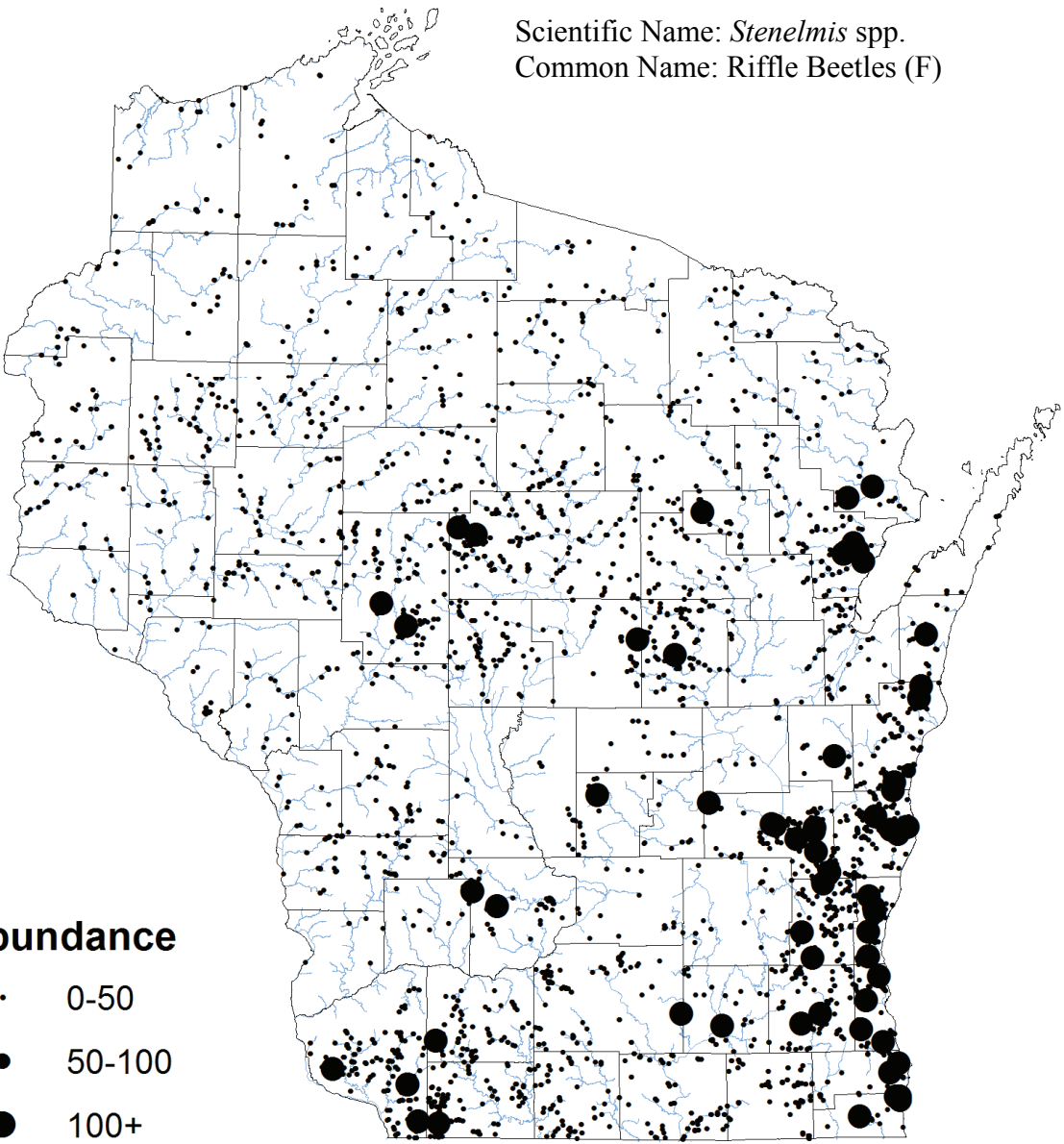
# Coleoptera Elmidae



Scientific Name: *Stenelmis* spp.  
Common Name: Riffle Beetles (F)

**Abundance**

- 0-50
- 50-100
- 100+

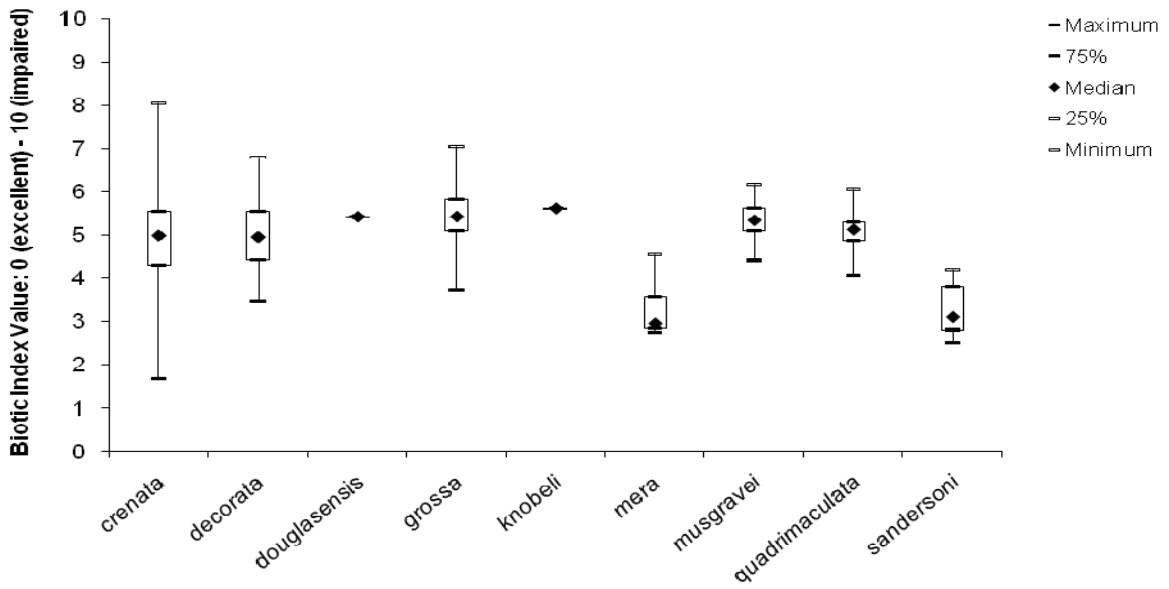
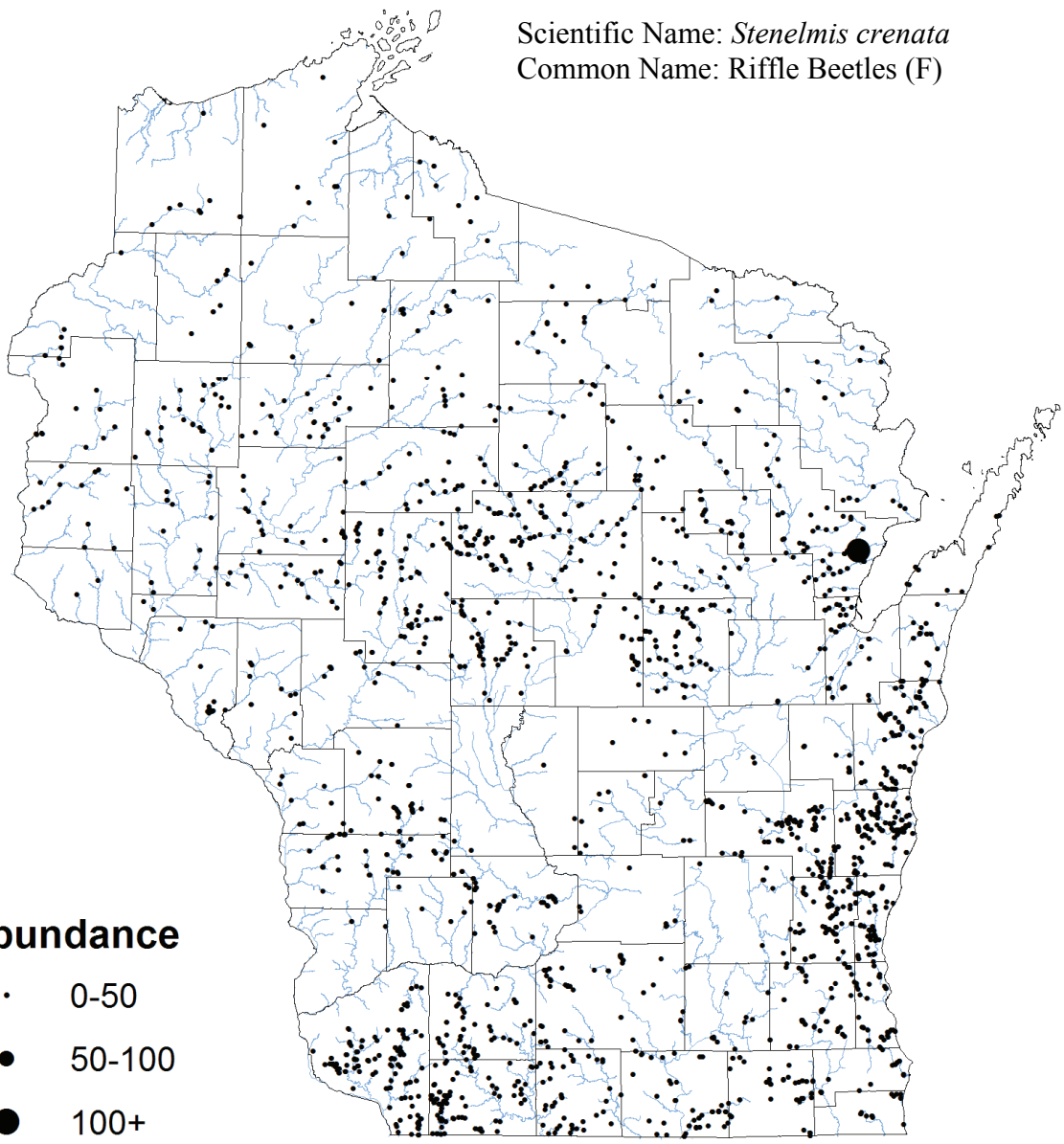


# Coleoptera Elmidae

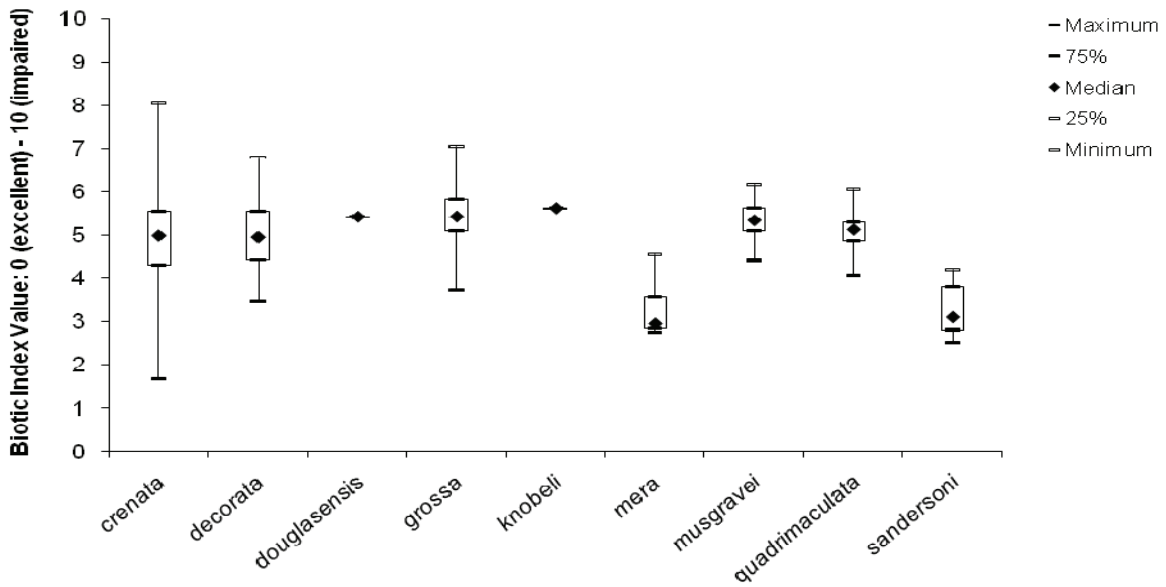
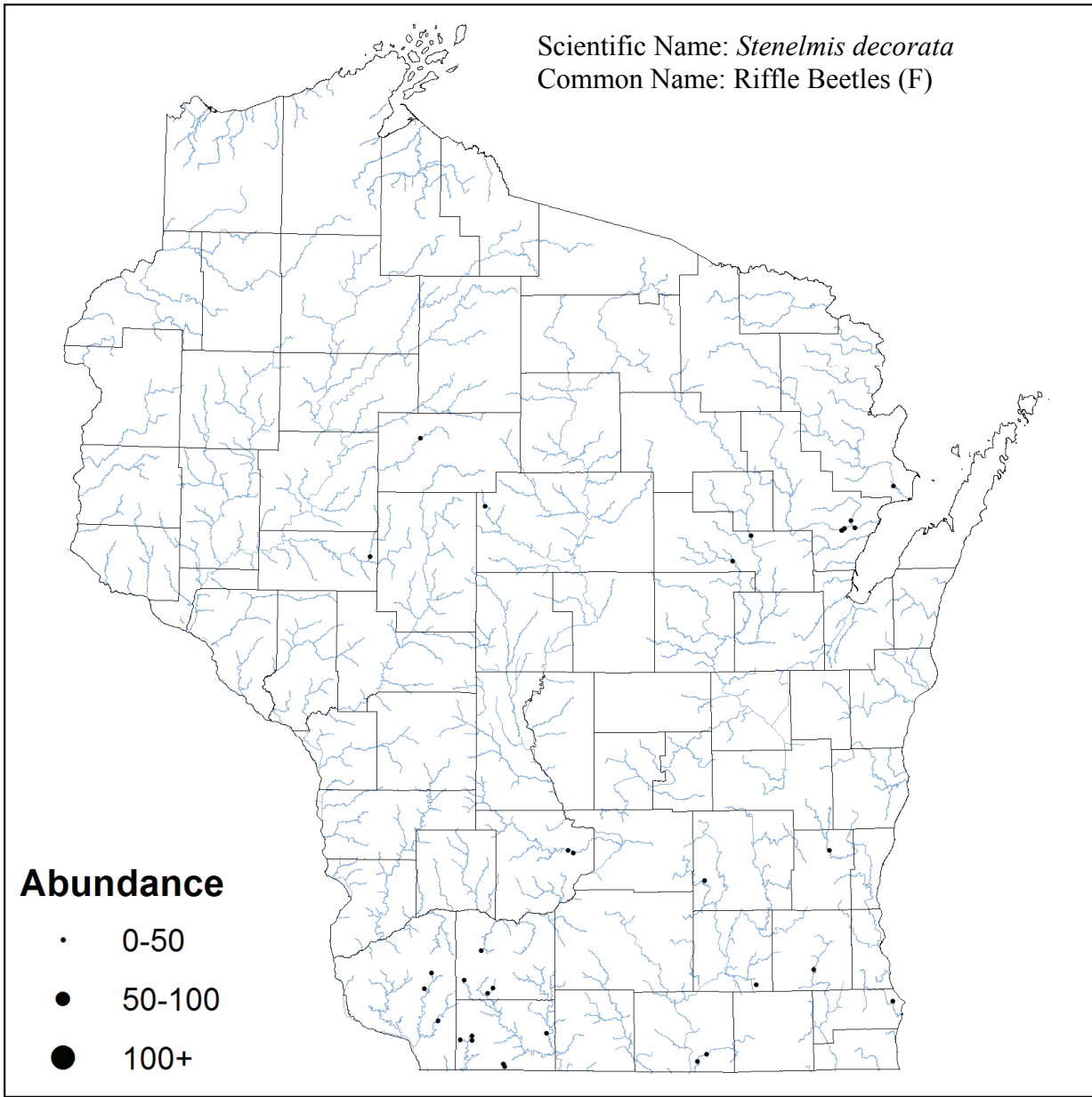
Scientific Name: *Stenelmis crenata*  
Common Name: Riffle Beetles (F)

## Abundance

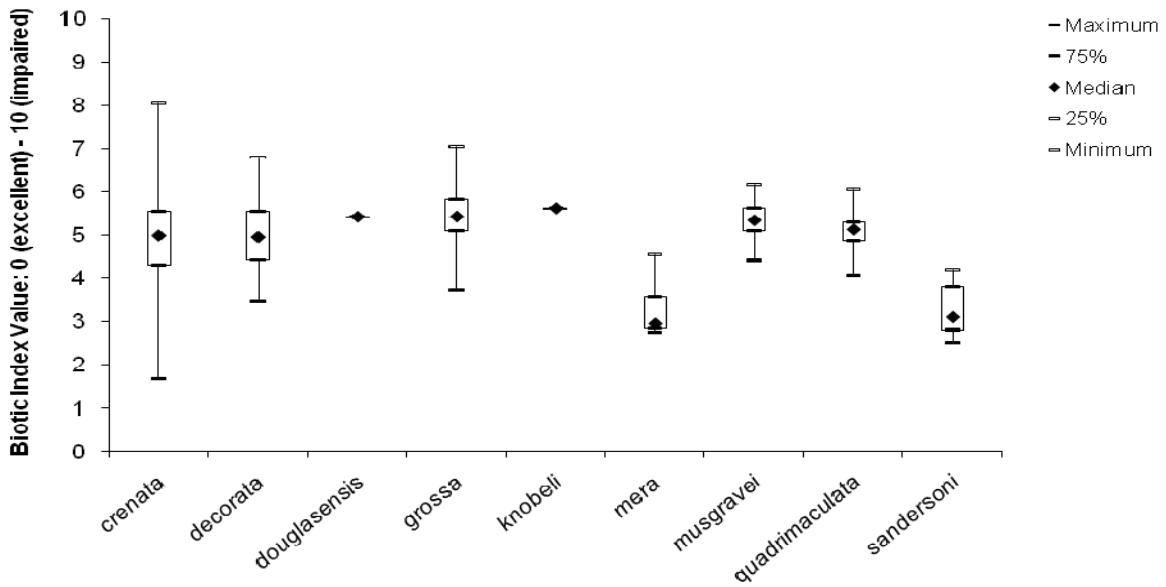
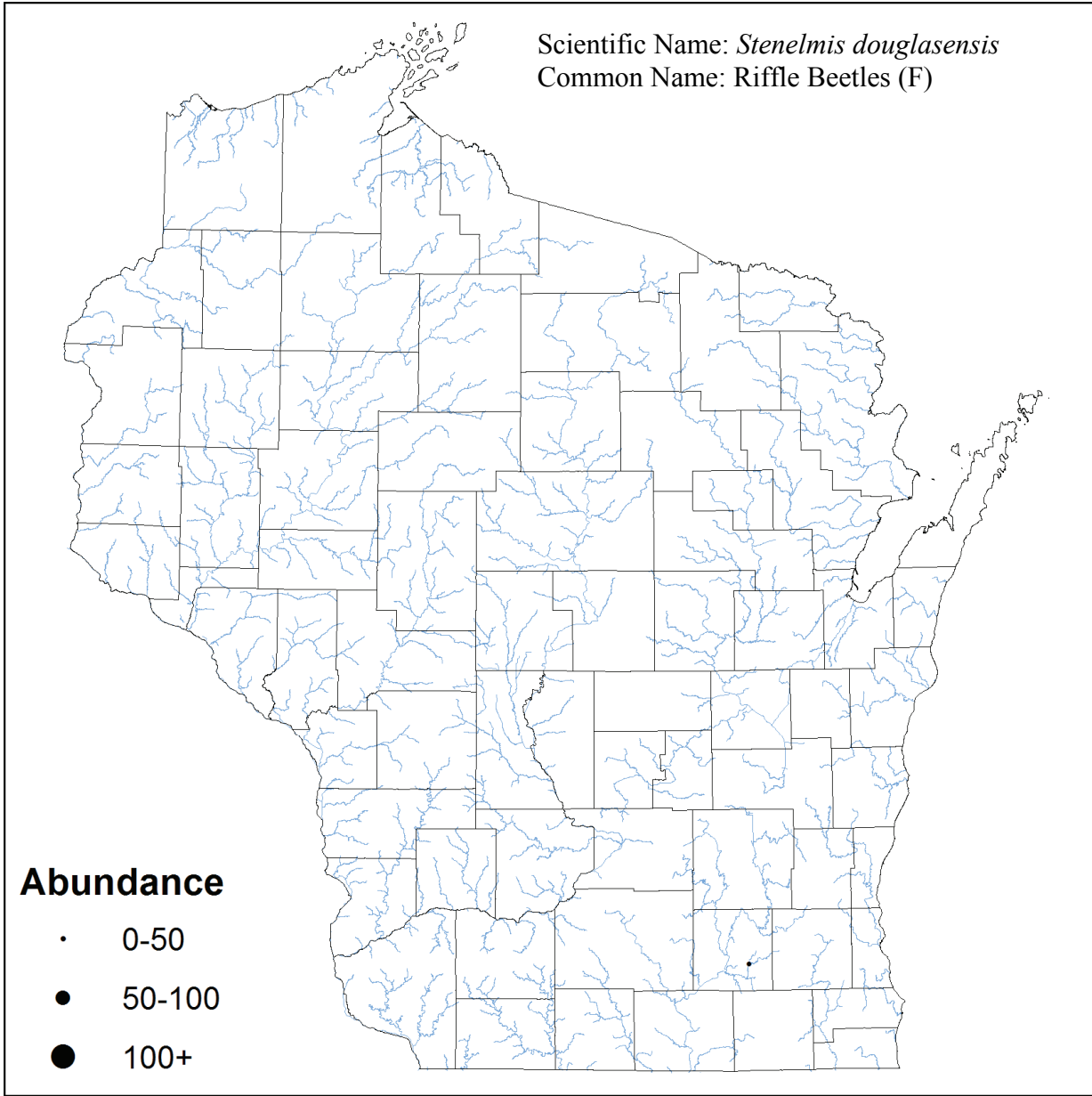
- 0-50
- 50-100
- 100+

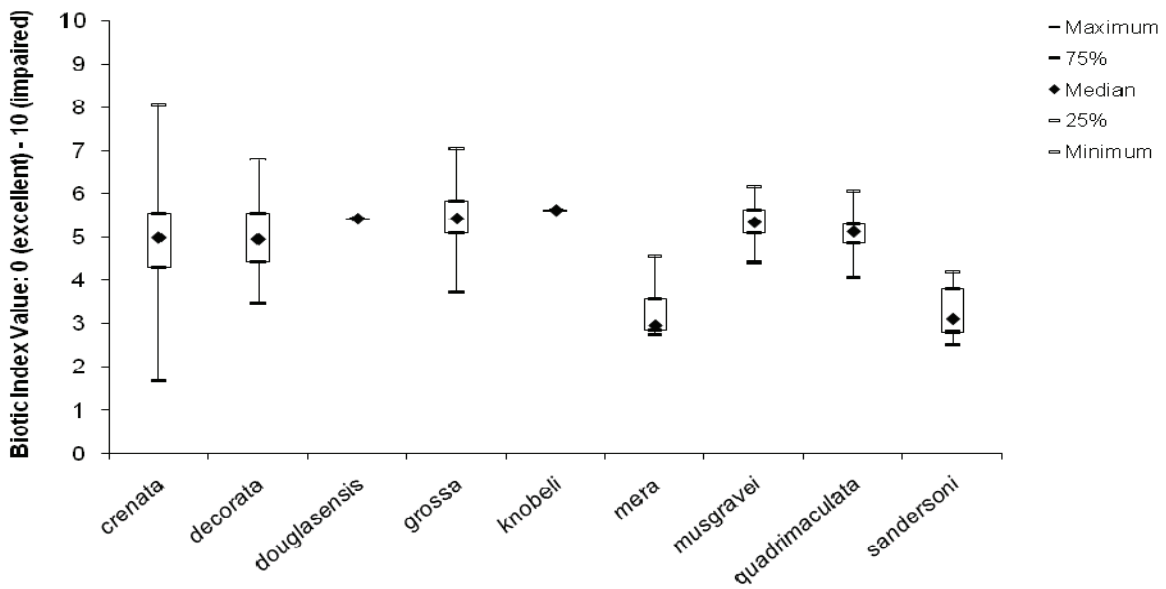
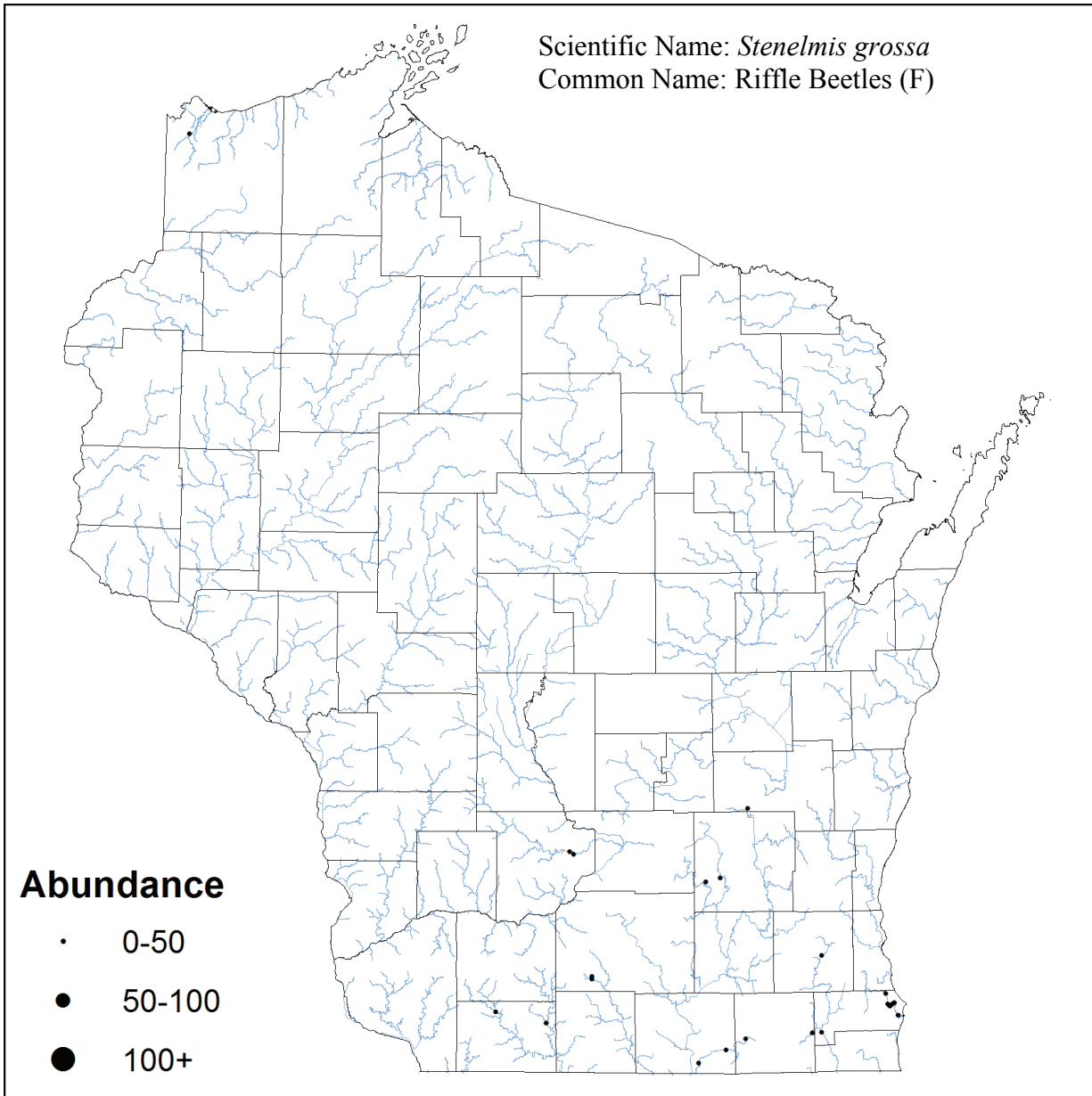




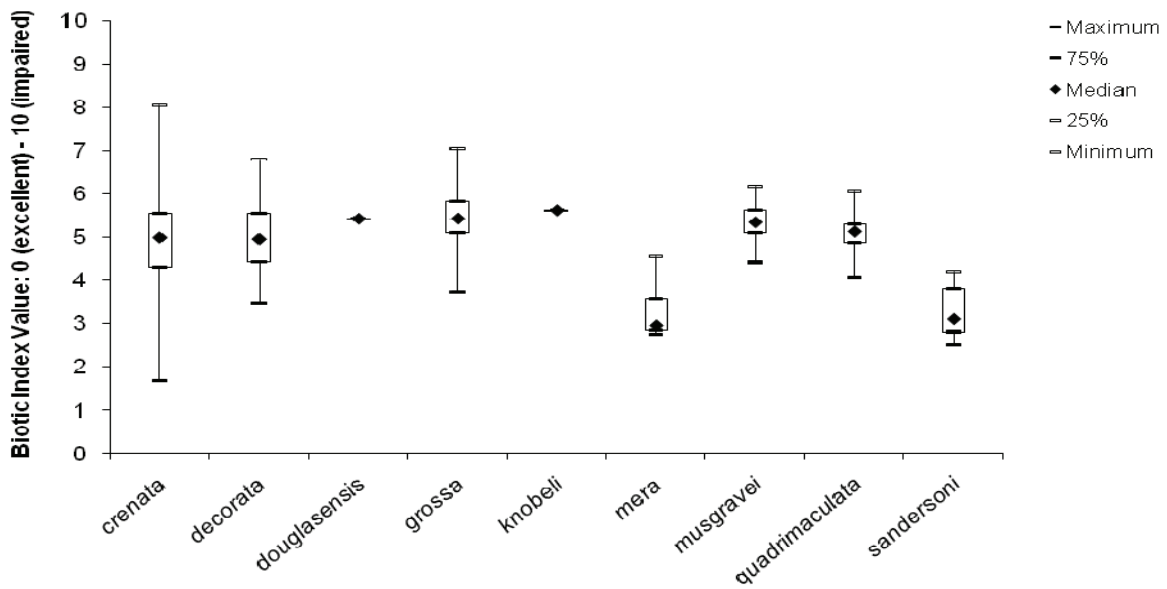
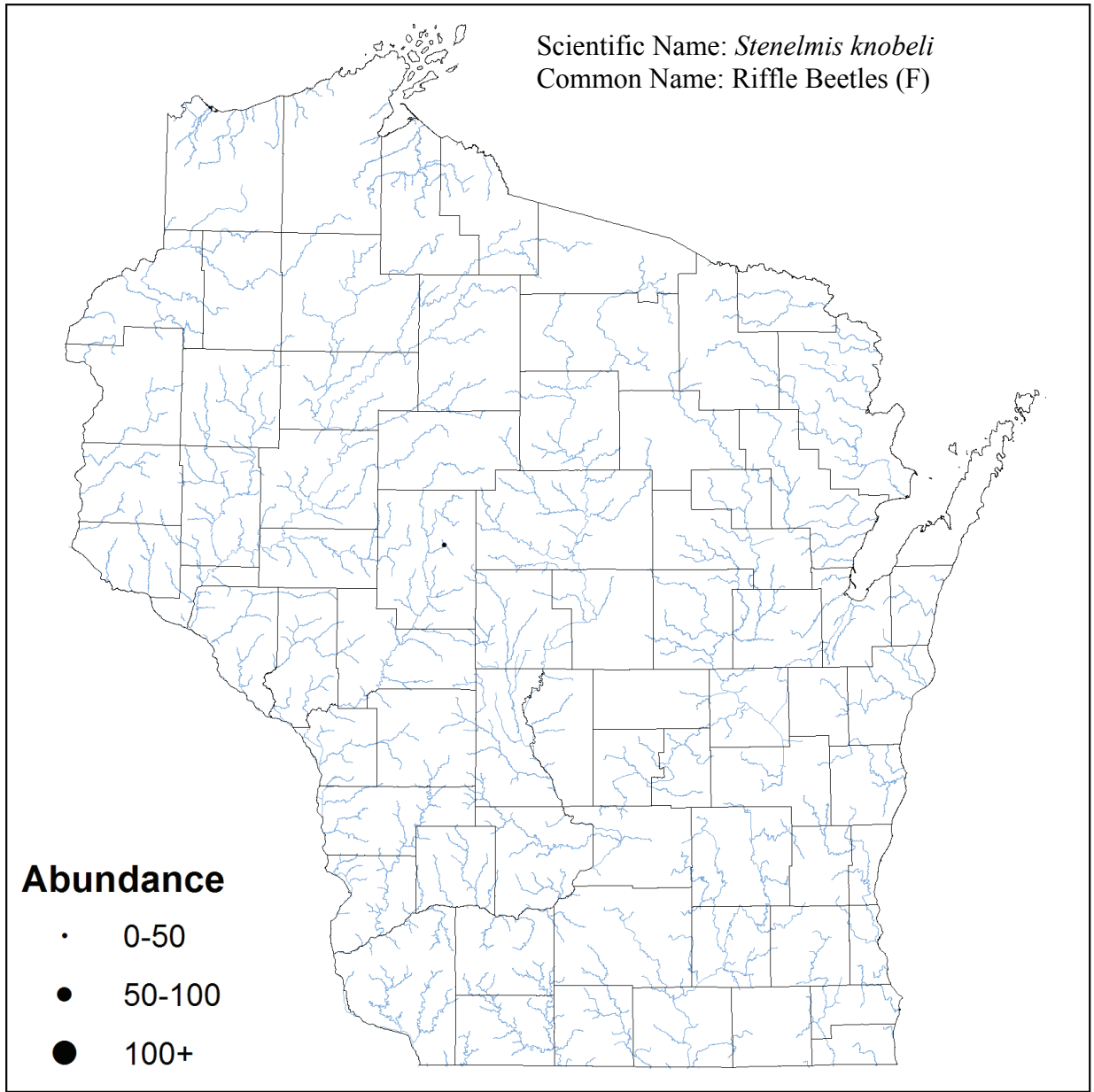


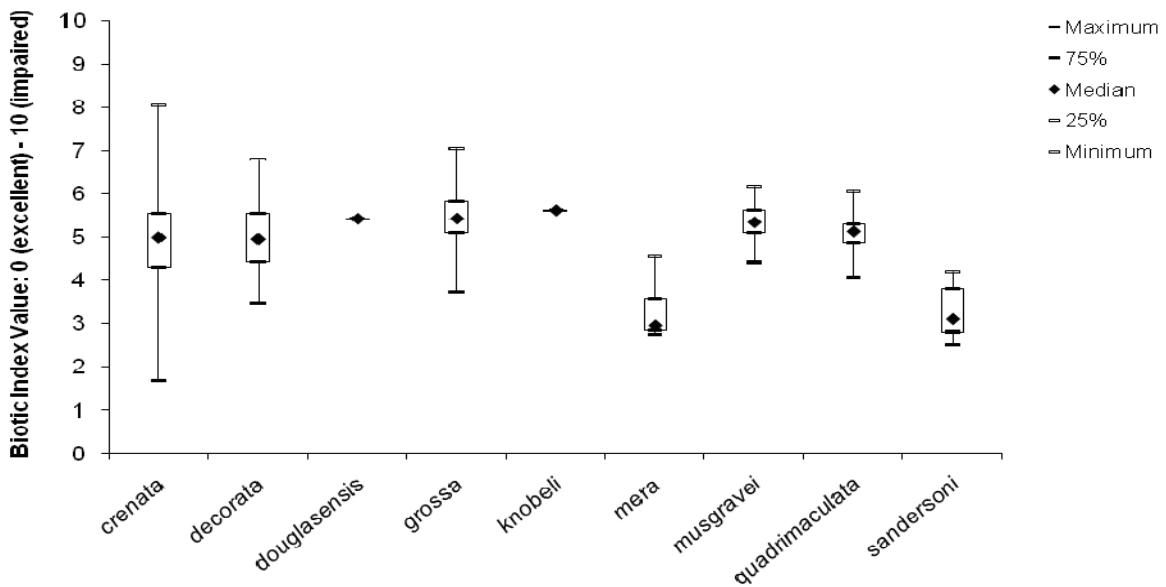
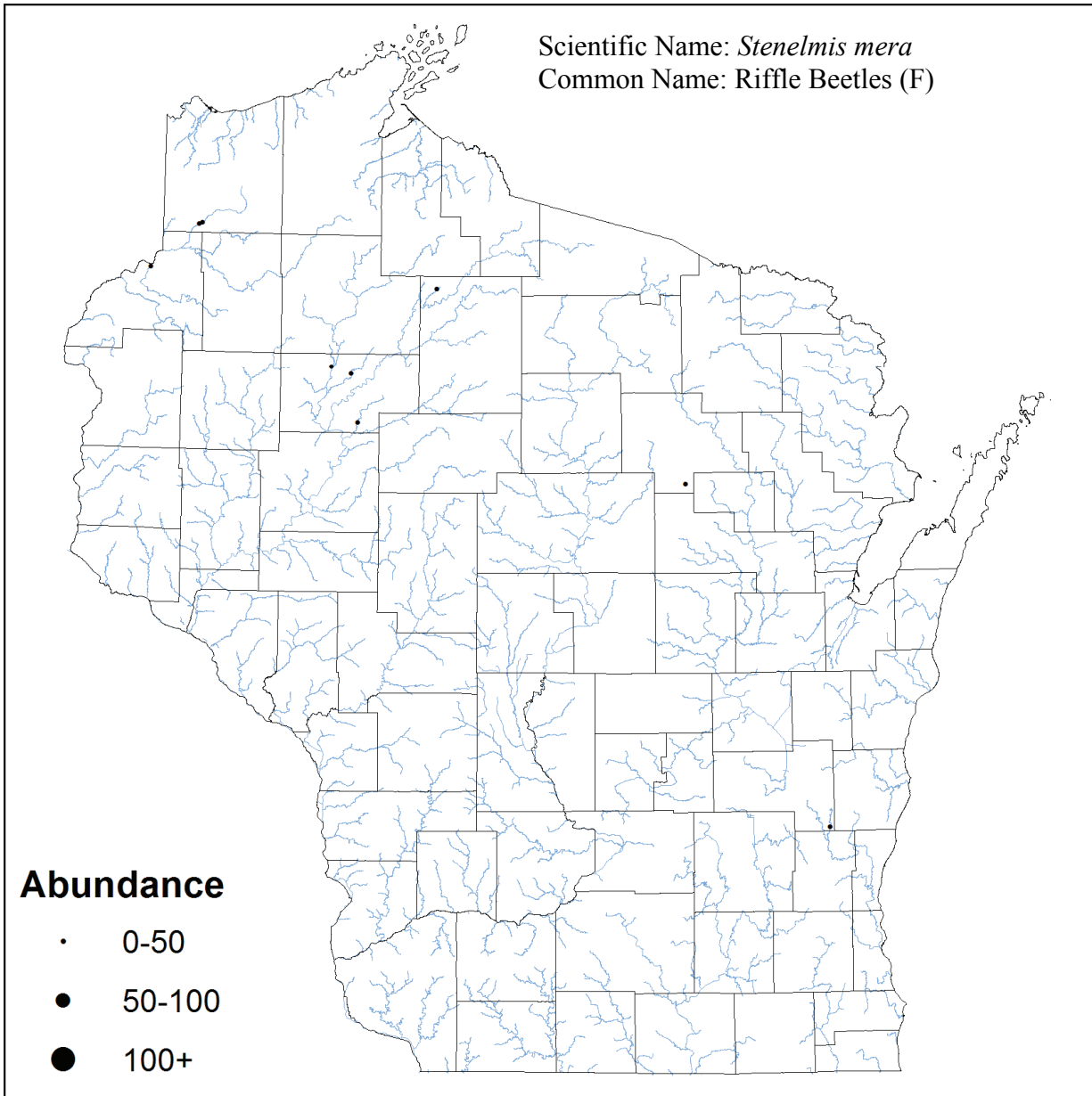
# Coleoptera Elmidae



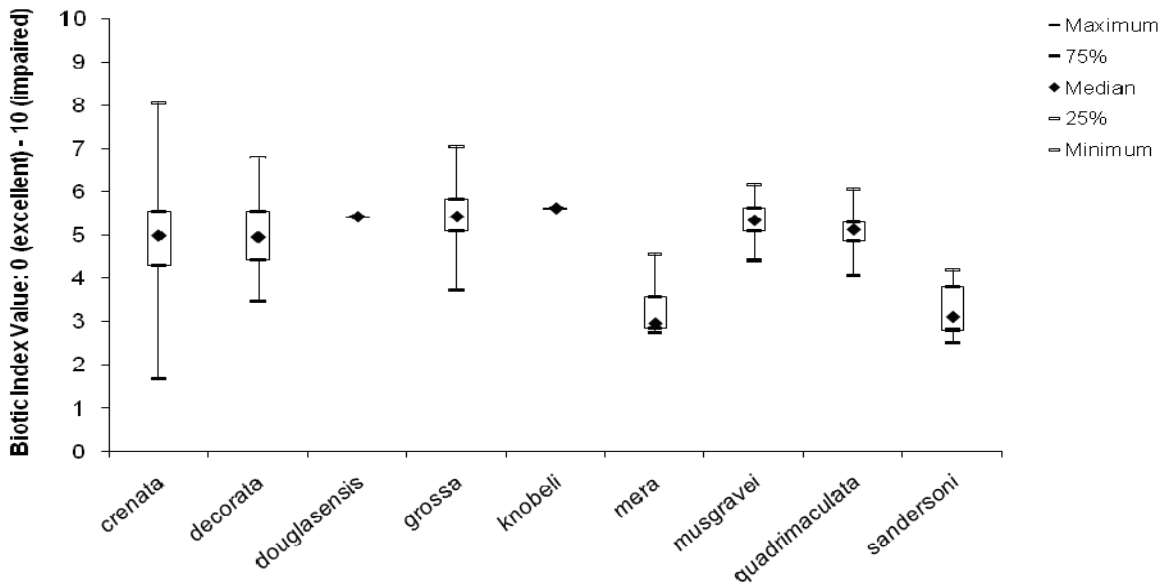
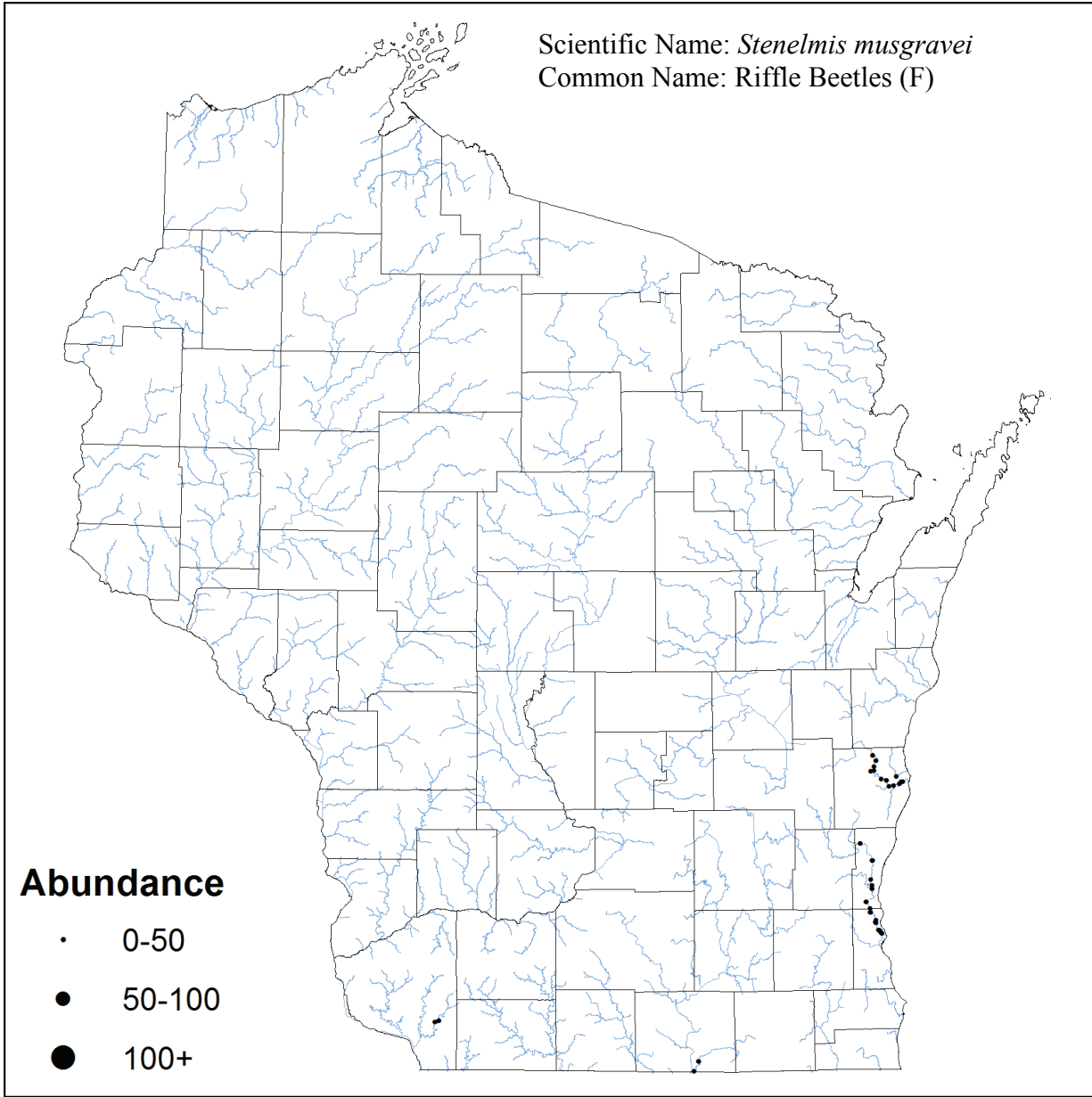


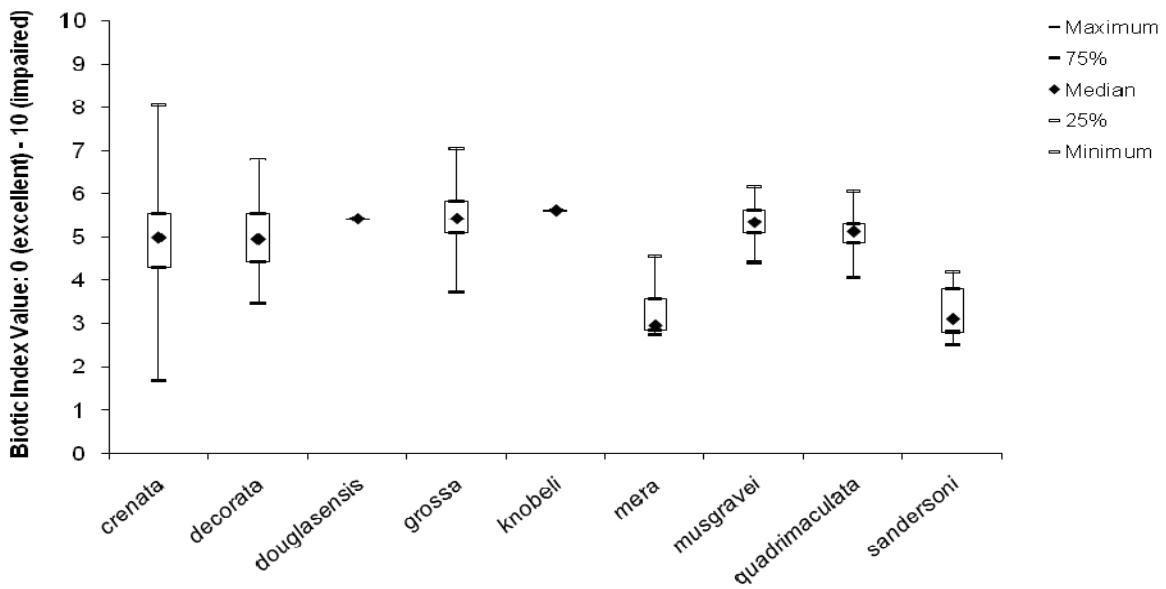
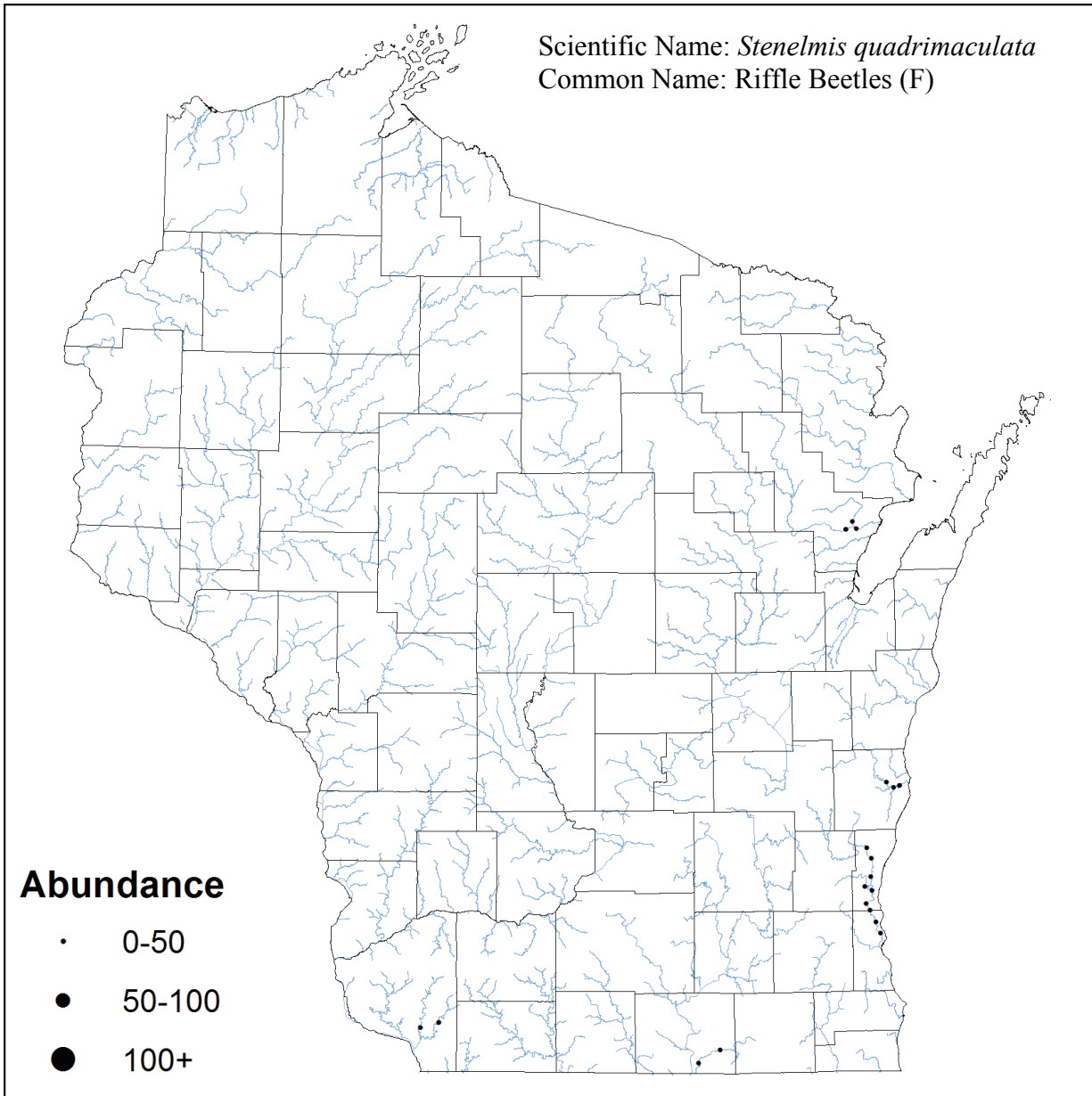
# Coleoptera Elmidae



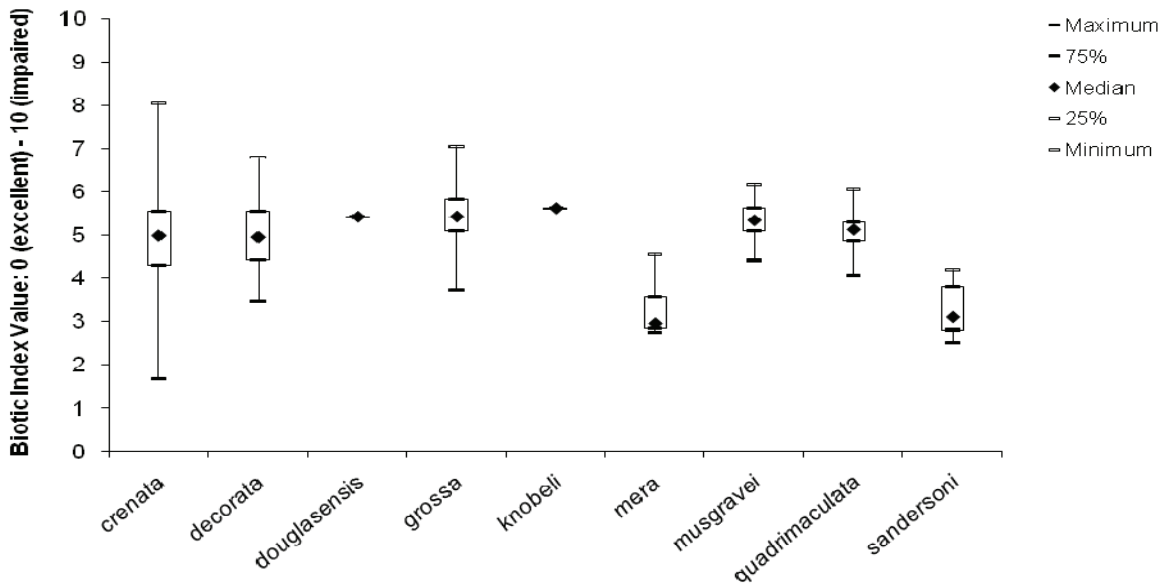
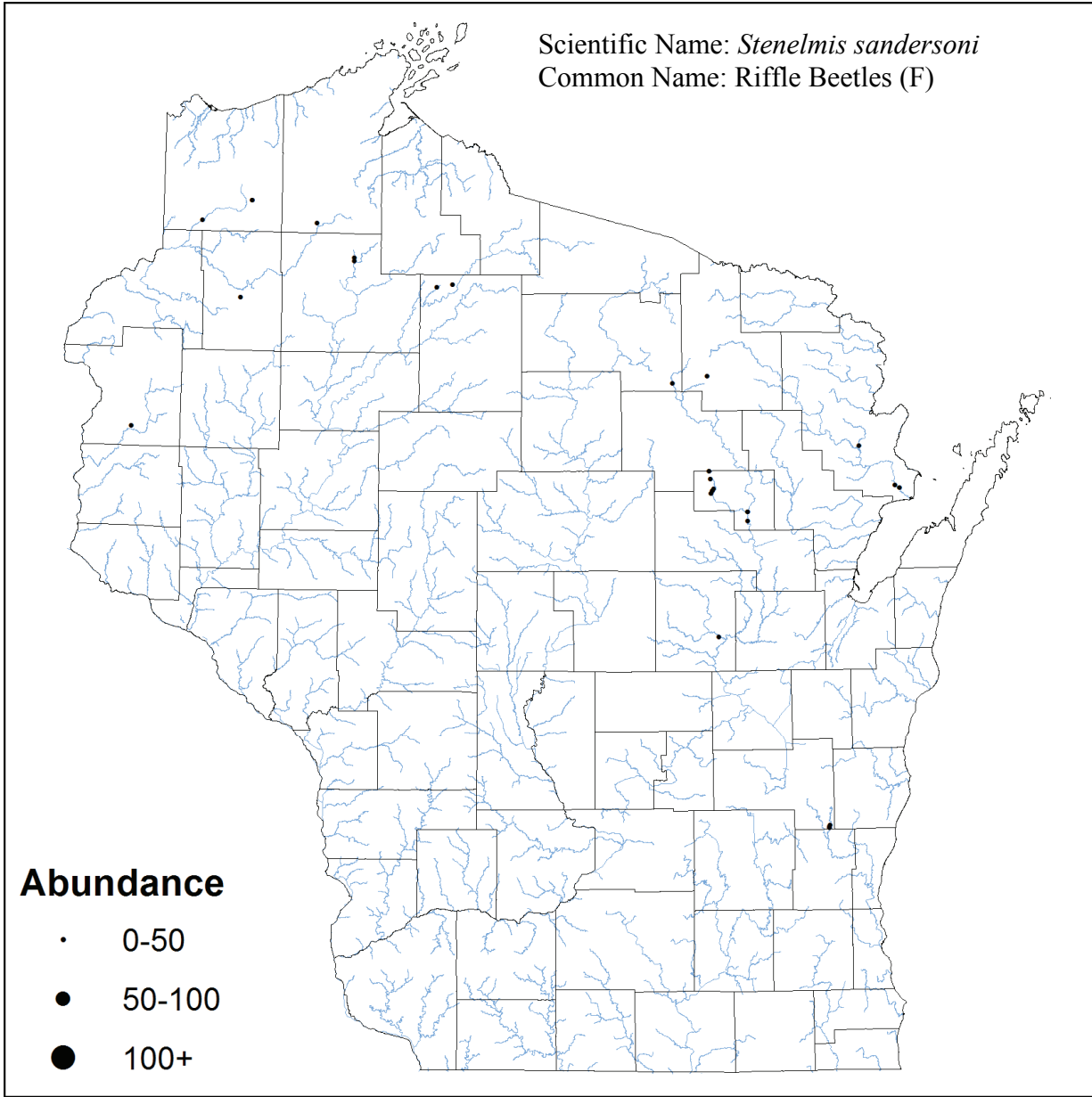


# Coleoptera Elmidae

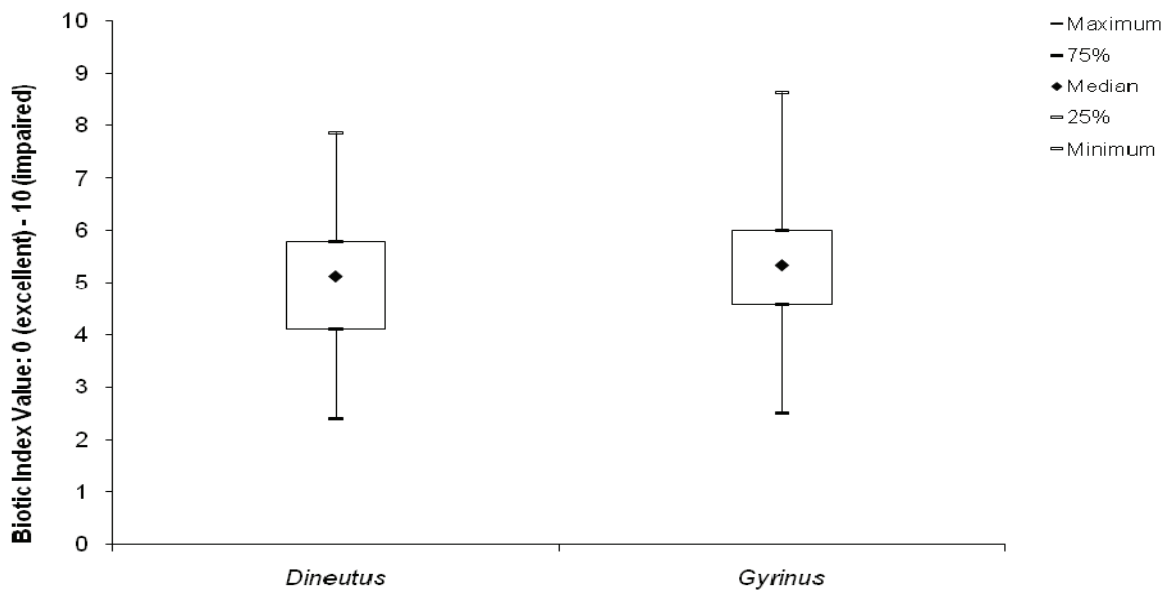
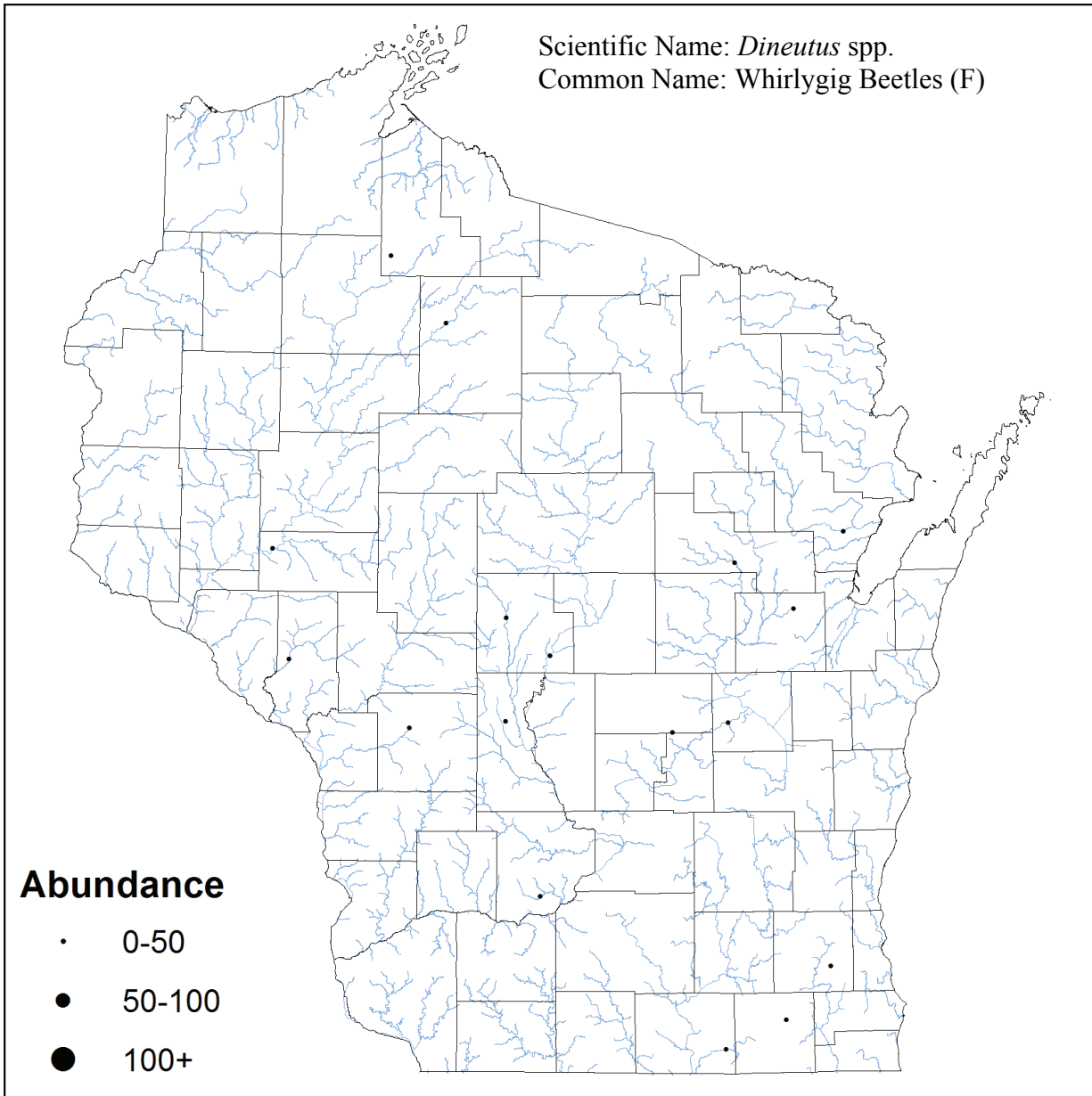




# Coleoptera Elmidae





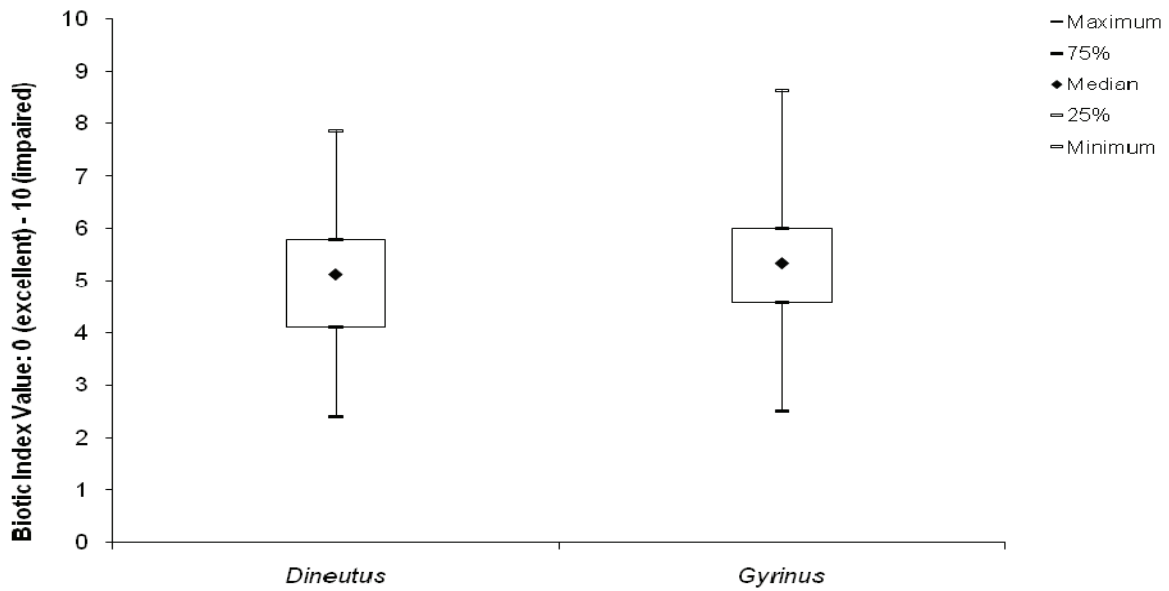
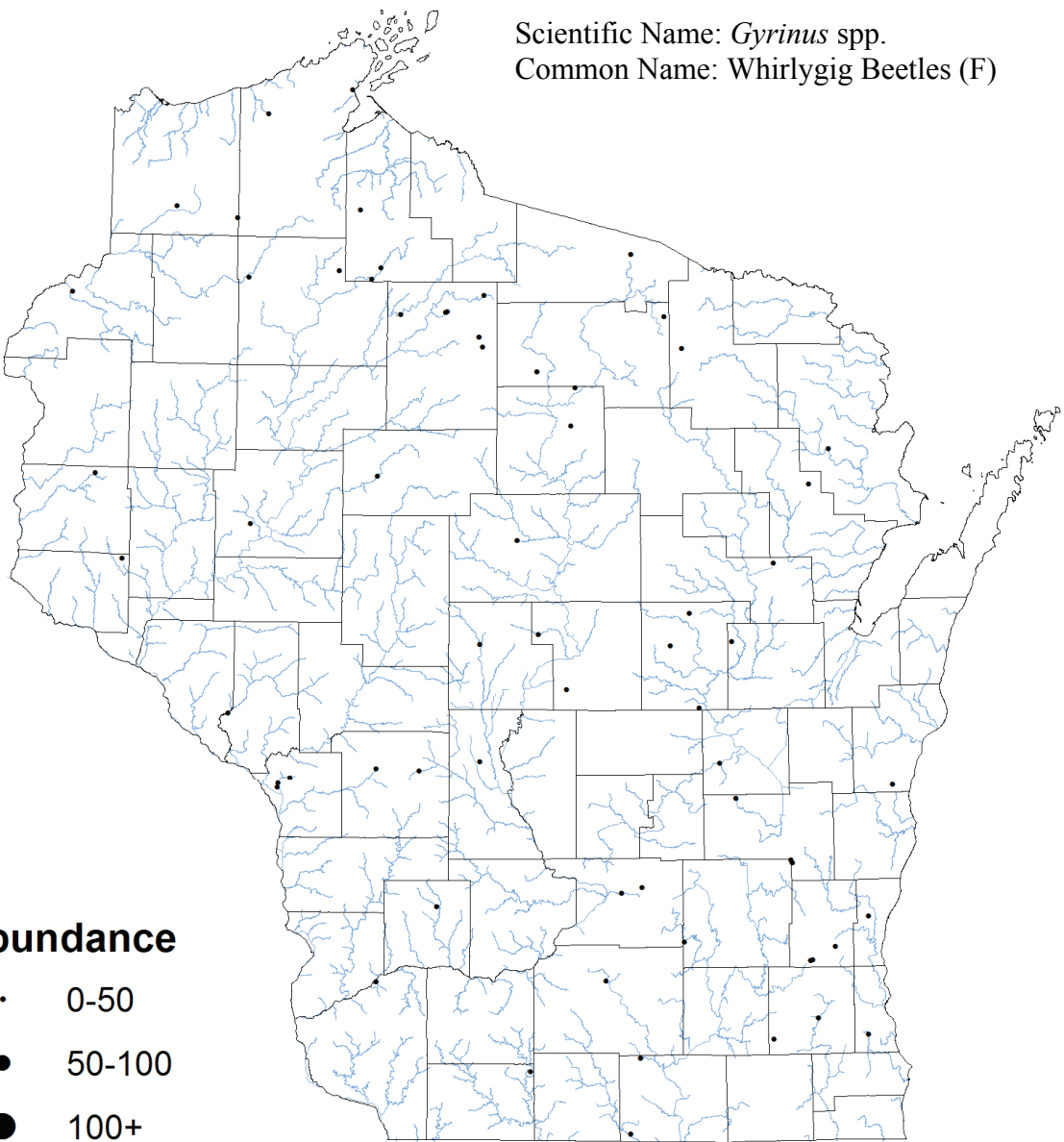


# Coleoptera Gyrinidae

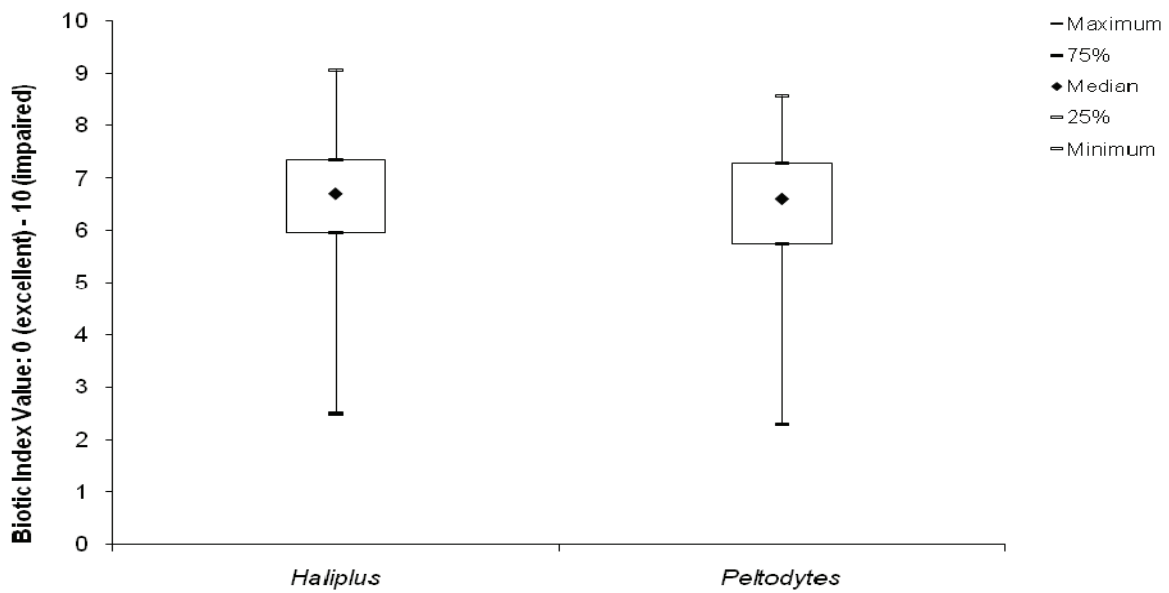
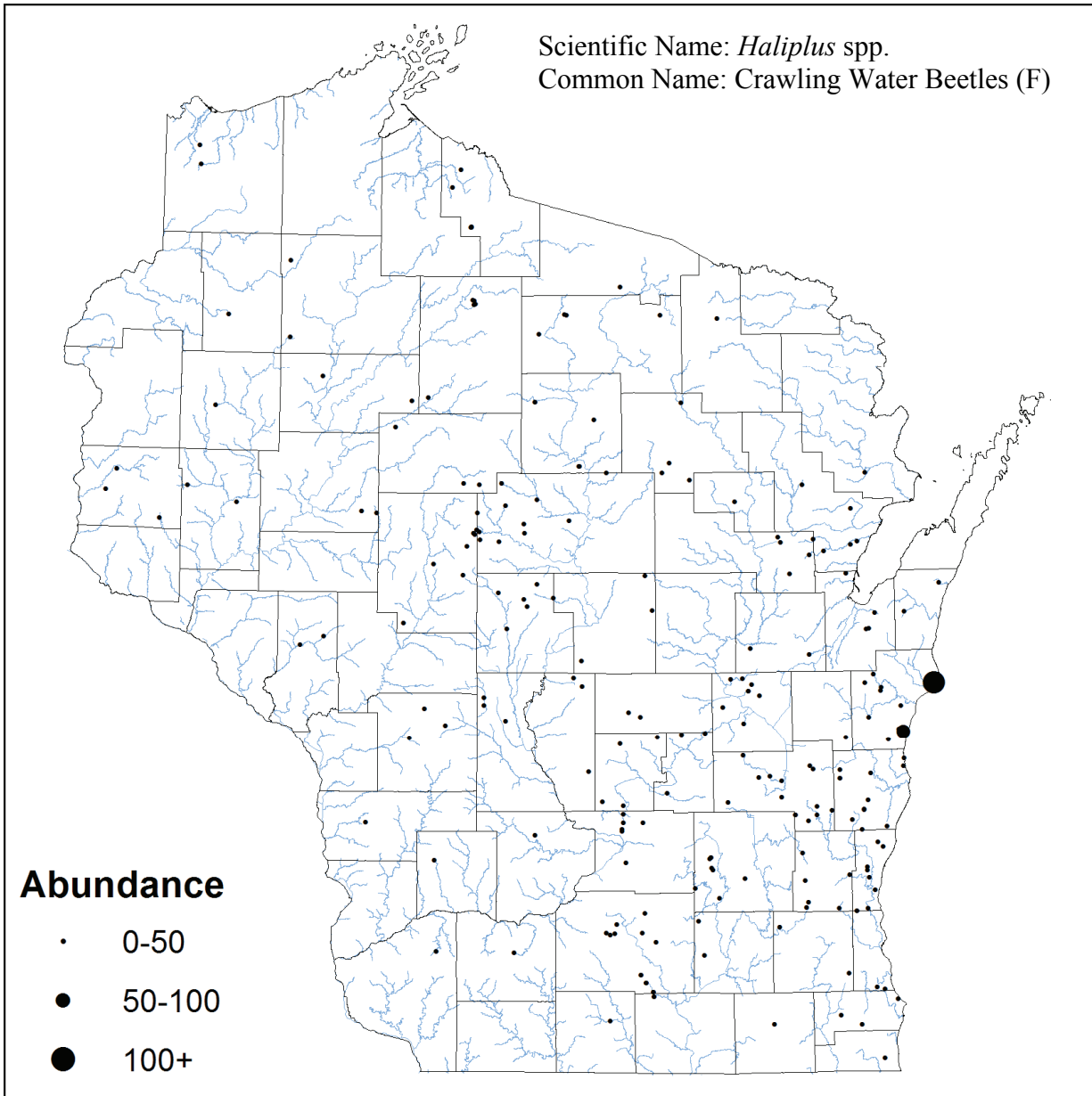
Scientific Name: *Gyrinus* spp.  
 Common Name: Whirlygig Beetles (F)

## Abundance

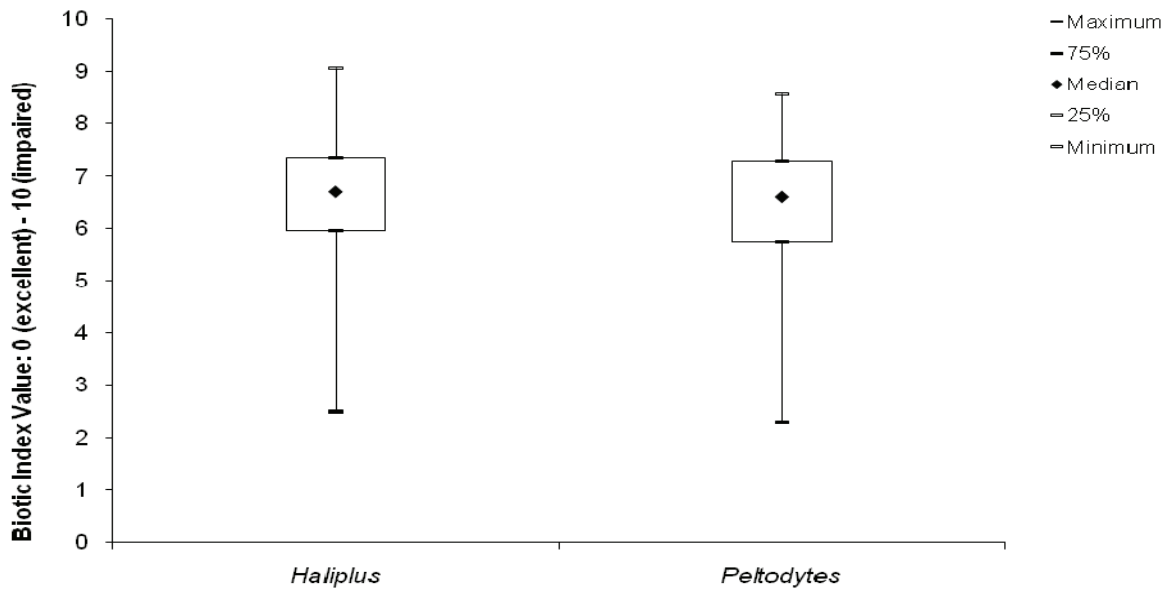
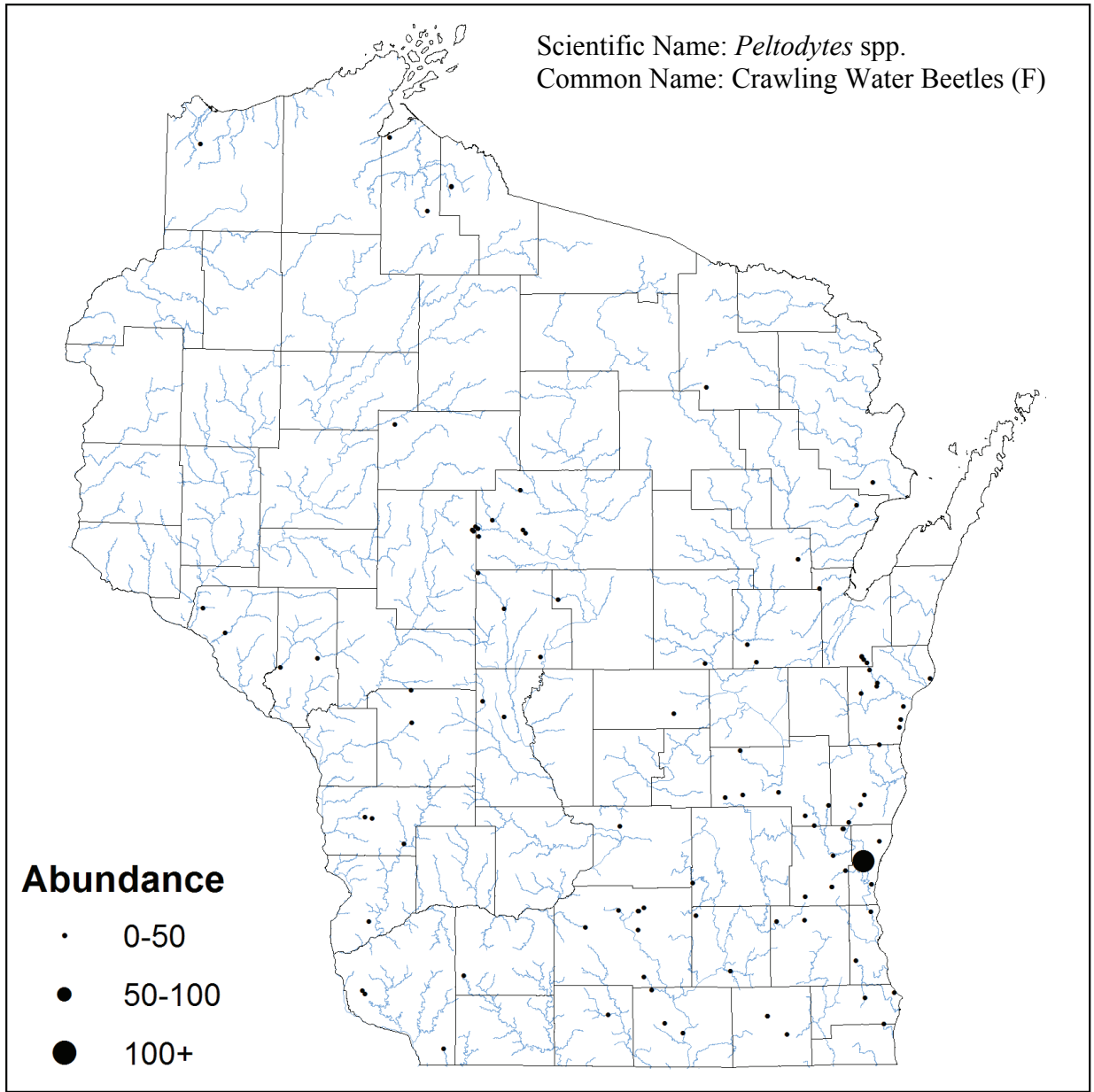
- 0-50
- 50-100
- 100+



# Coleoptera Haliplidae



# Coleoptera Haliplidae

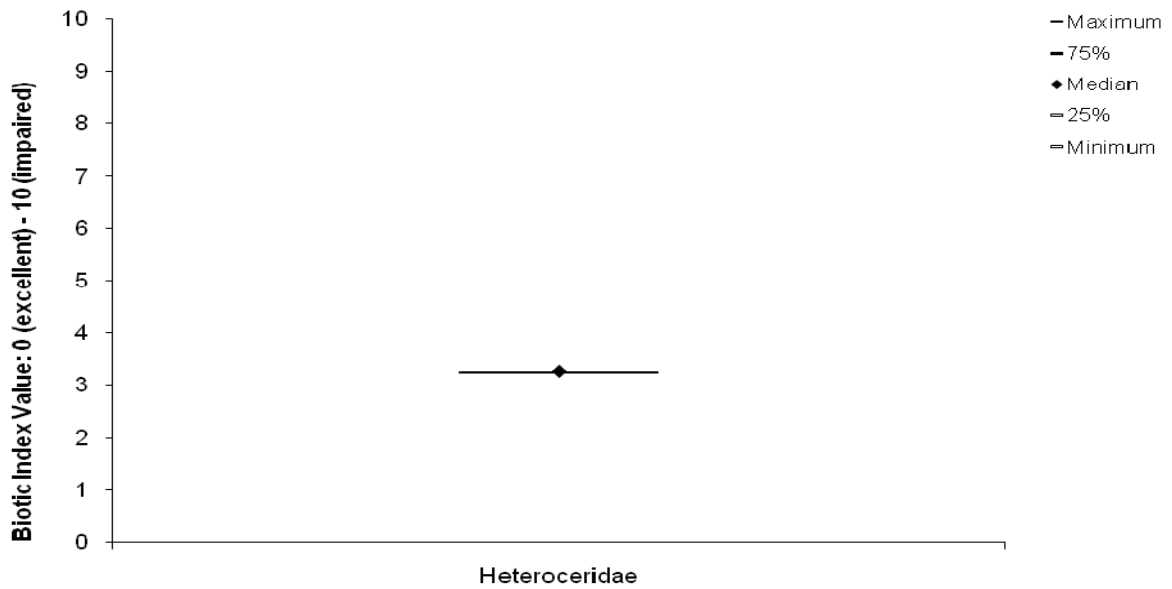
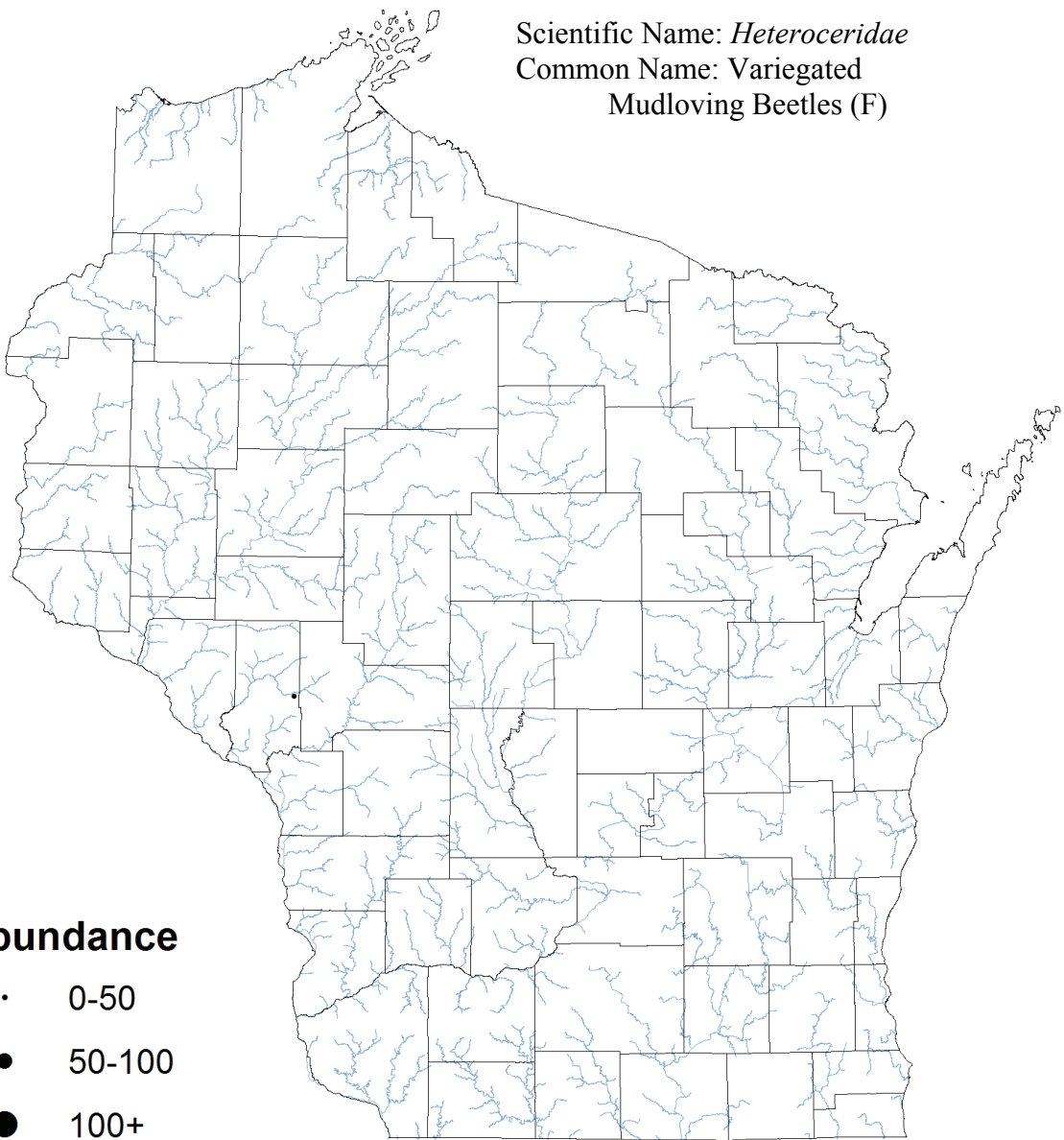


Coleoptera Heteroceridae

Scientific Name: *Heteroceridae*  
Common Name: Variegated  
Mudloving Beetles (F)

Abundance

- 0-50
- 50-100
- 100+

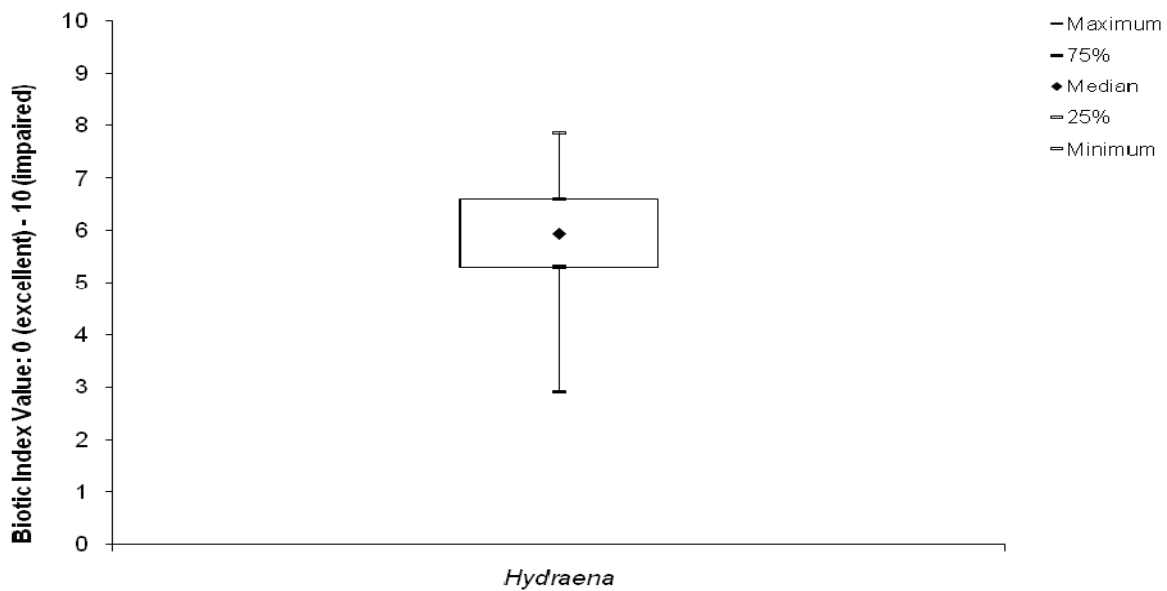
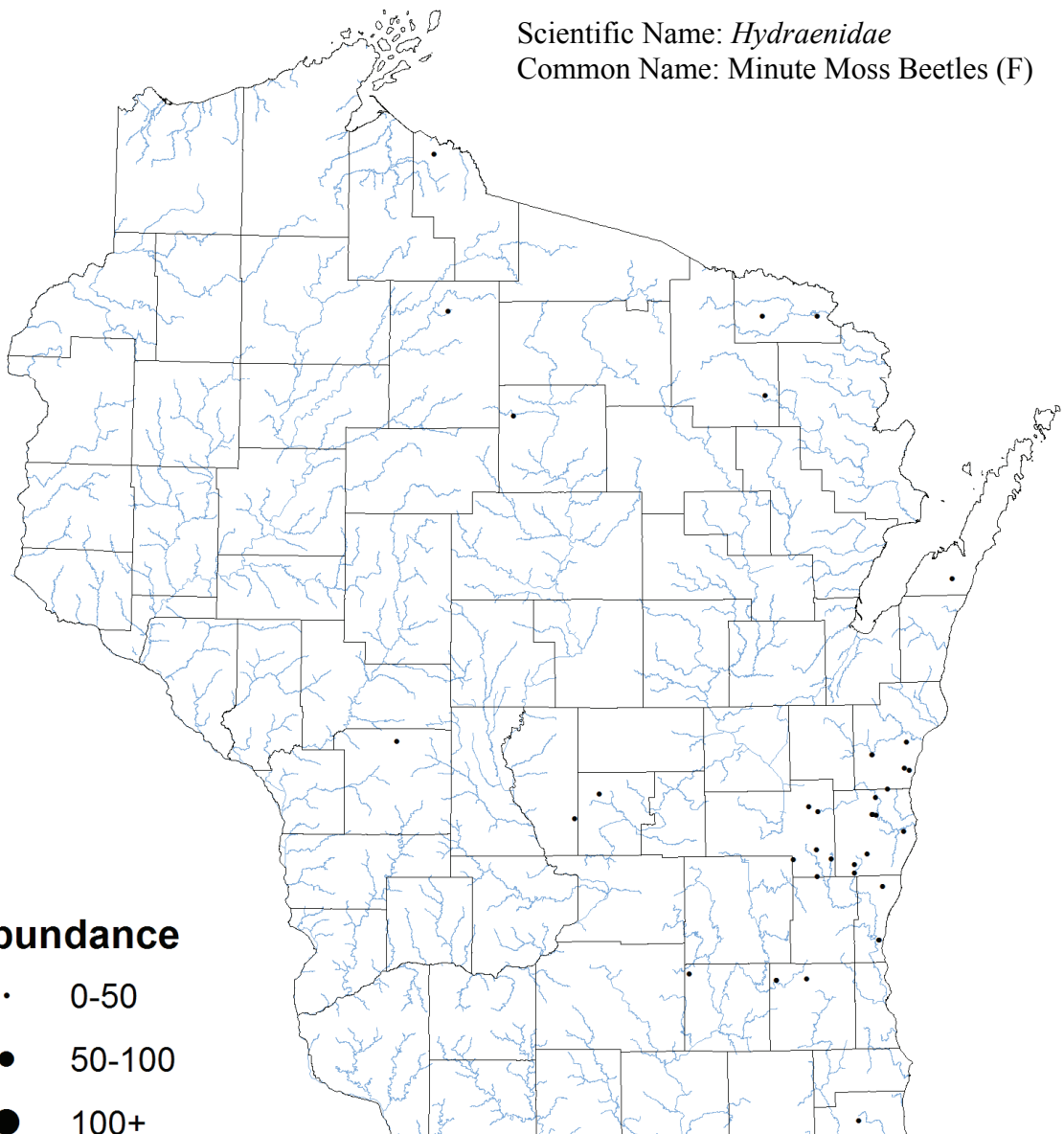


# Coleoptera Hydraenidae

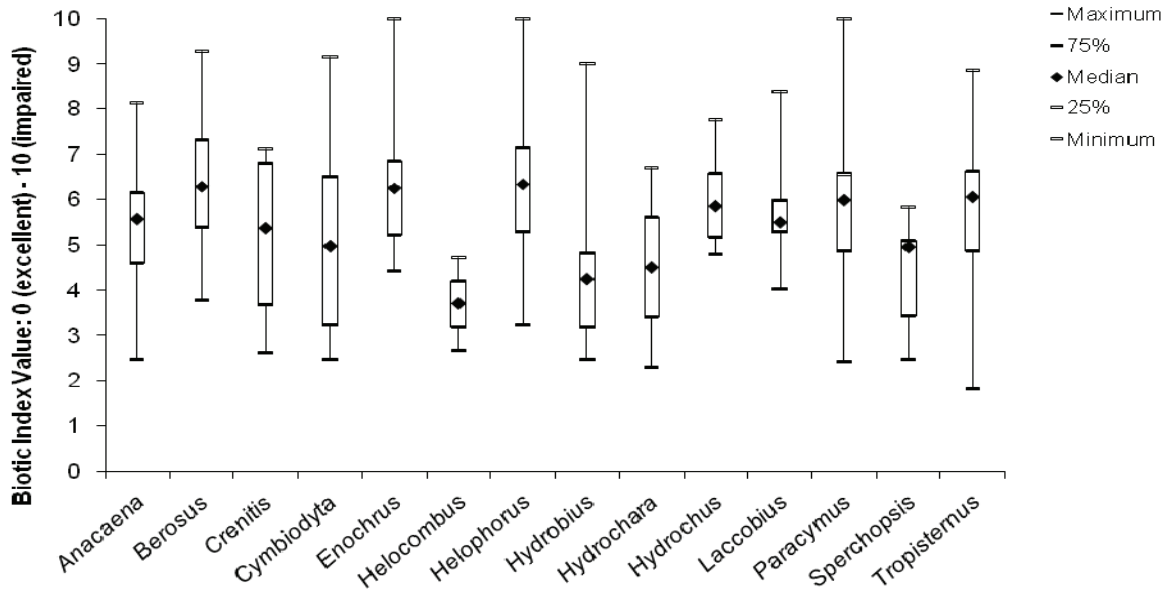
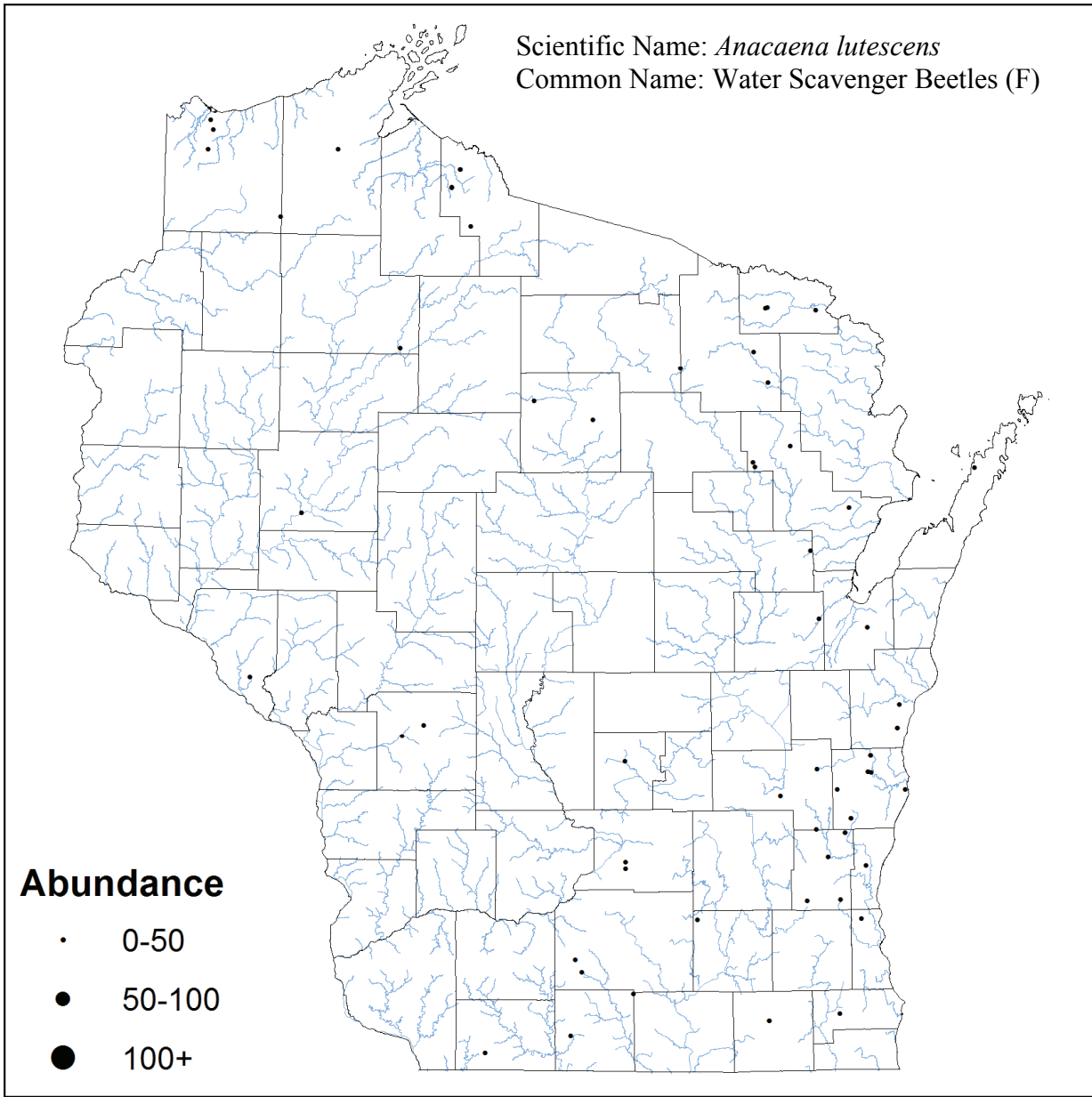
Scientific Name: *Hydraenidae*  
Common Name: Minute Moss Beetles (F)

## Abundance

- 0-50
- 50-100
- 100+



Scientific Name: *Anacaena lutescens*  
 Common Name: Water Scavenger Beetles (F)

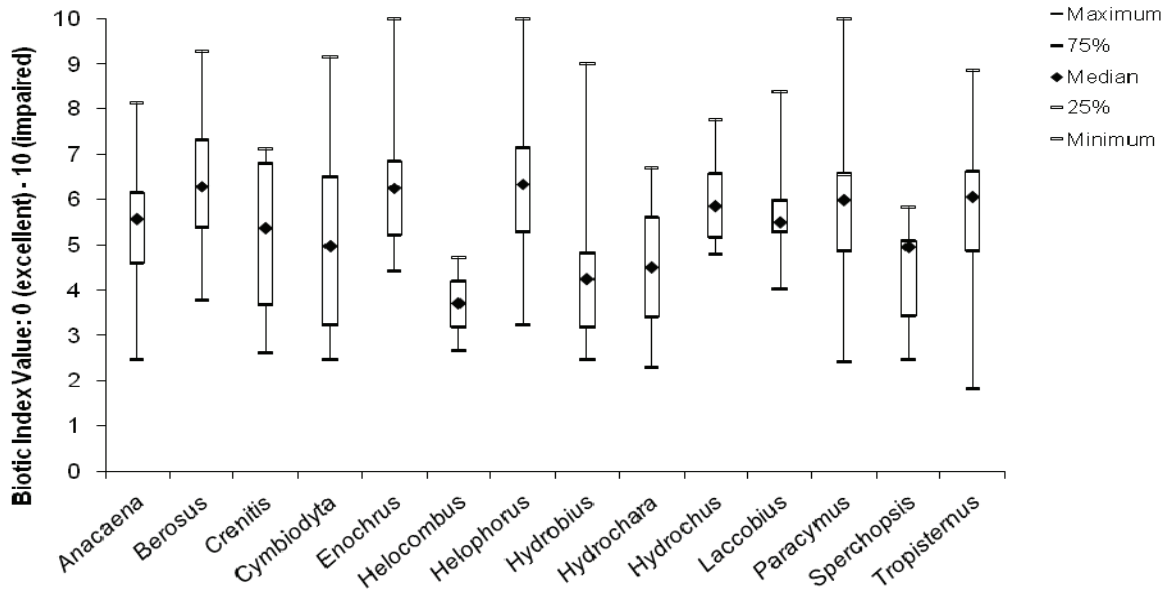
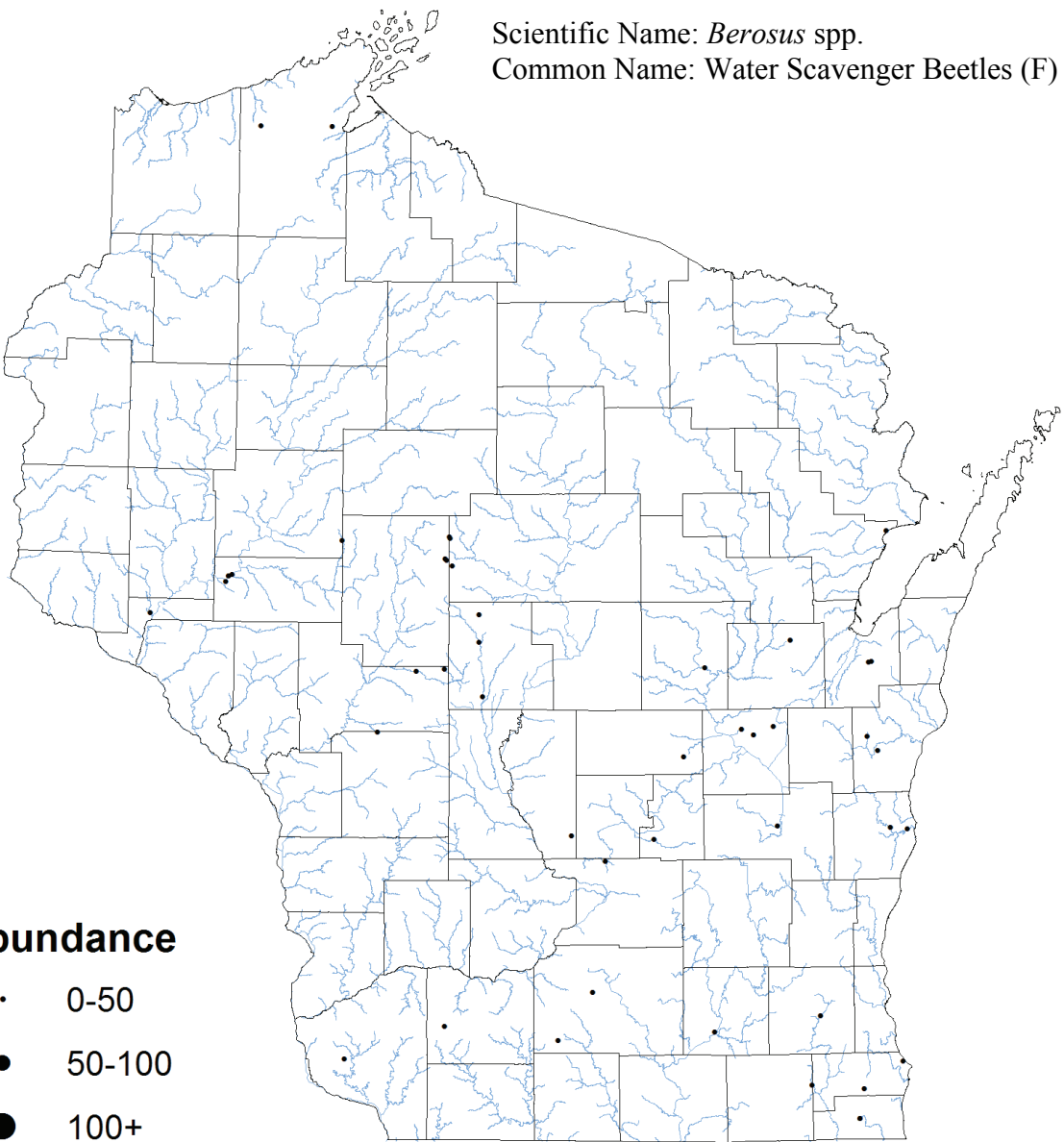


# Coleoptera Hydrophilidae

Scientific Name: *Berosus* spp.  
 Common Name: Water Scavenger Beetles (F)

## Abundance

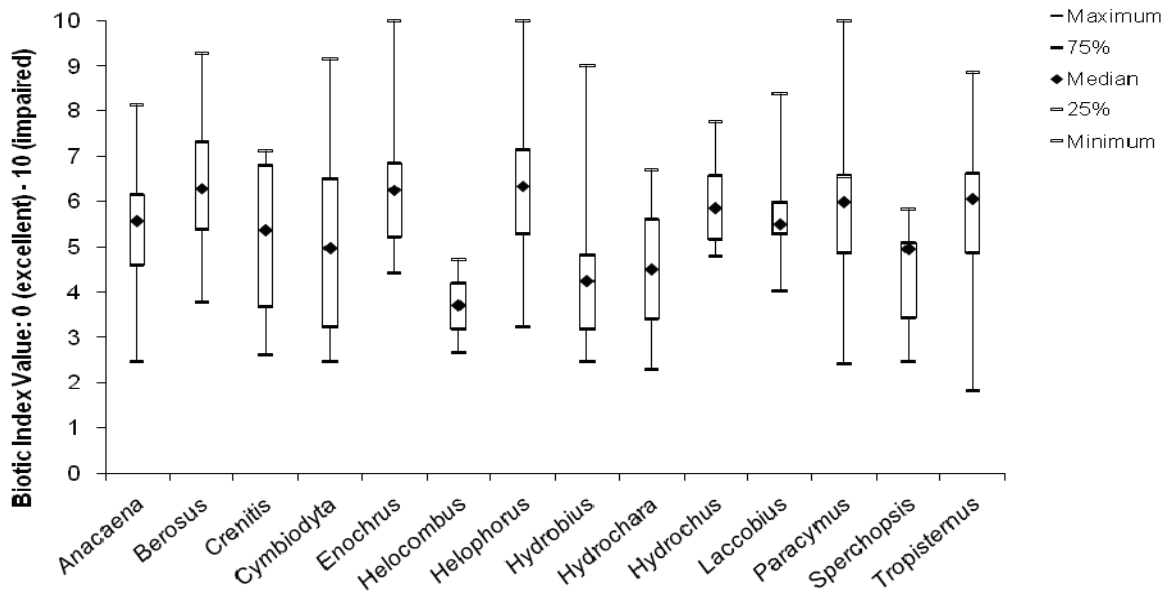
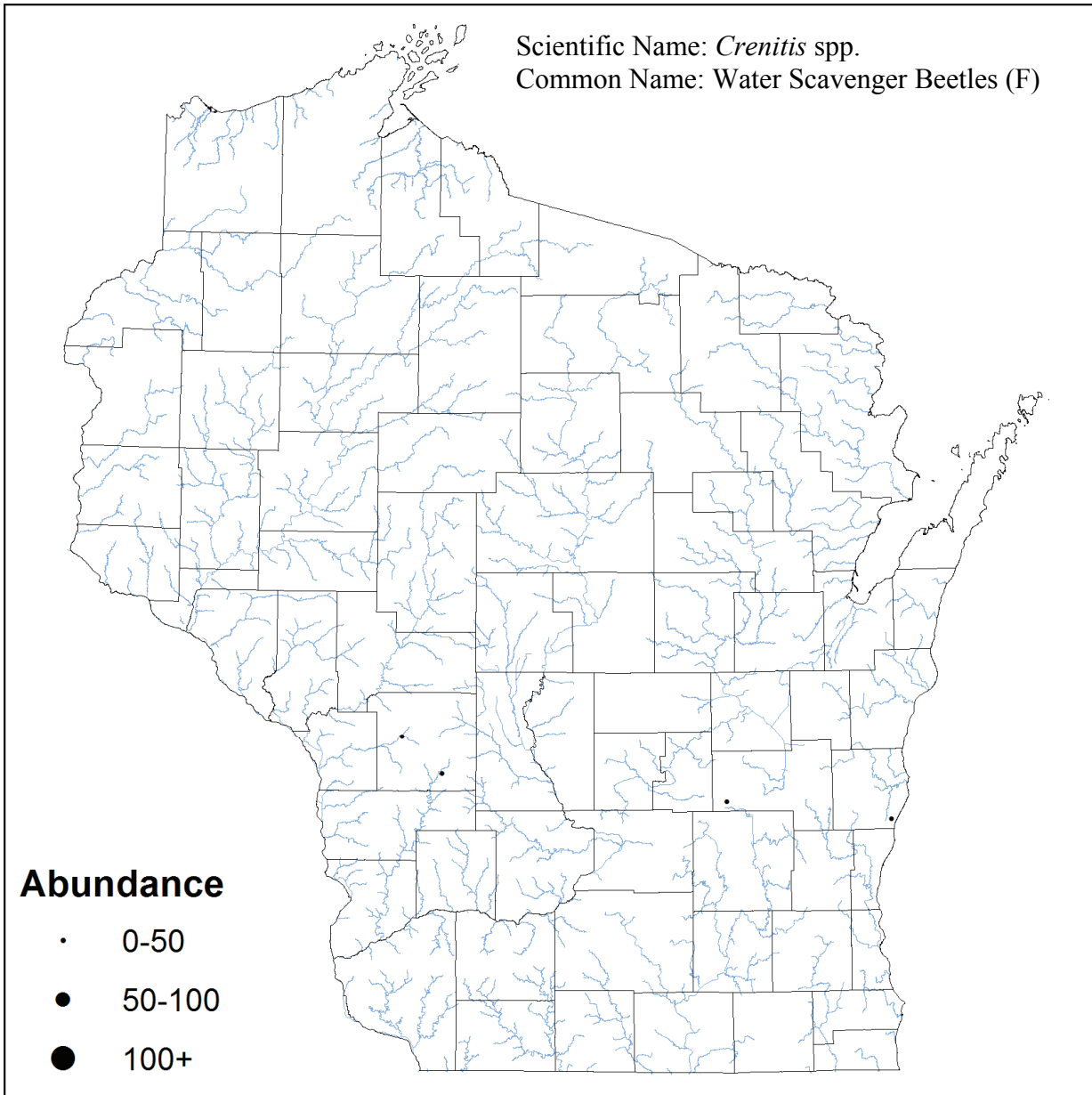
- 0-50
- 50-100
- 100+



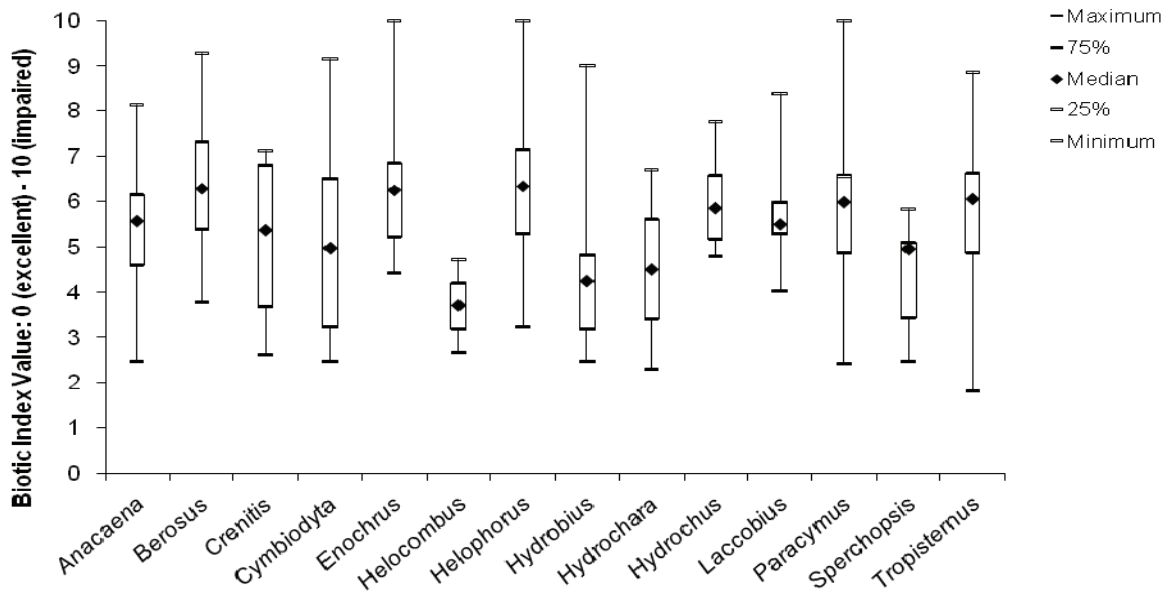
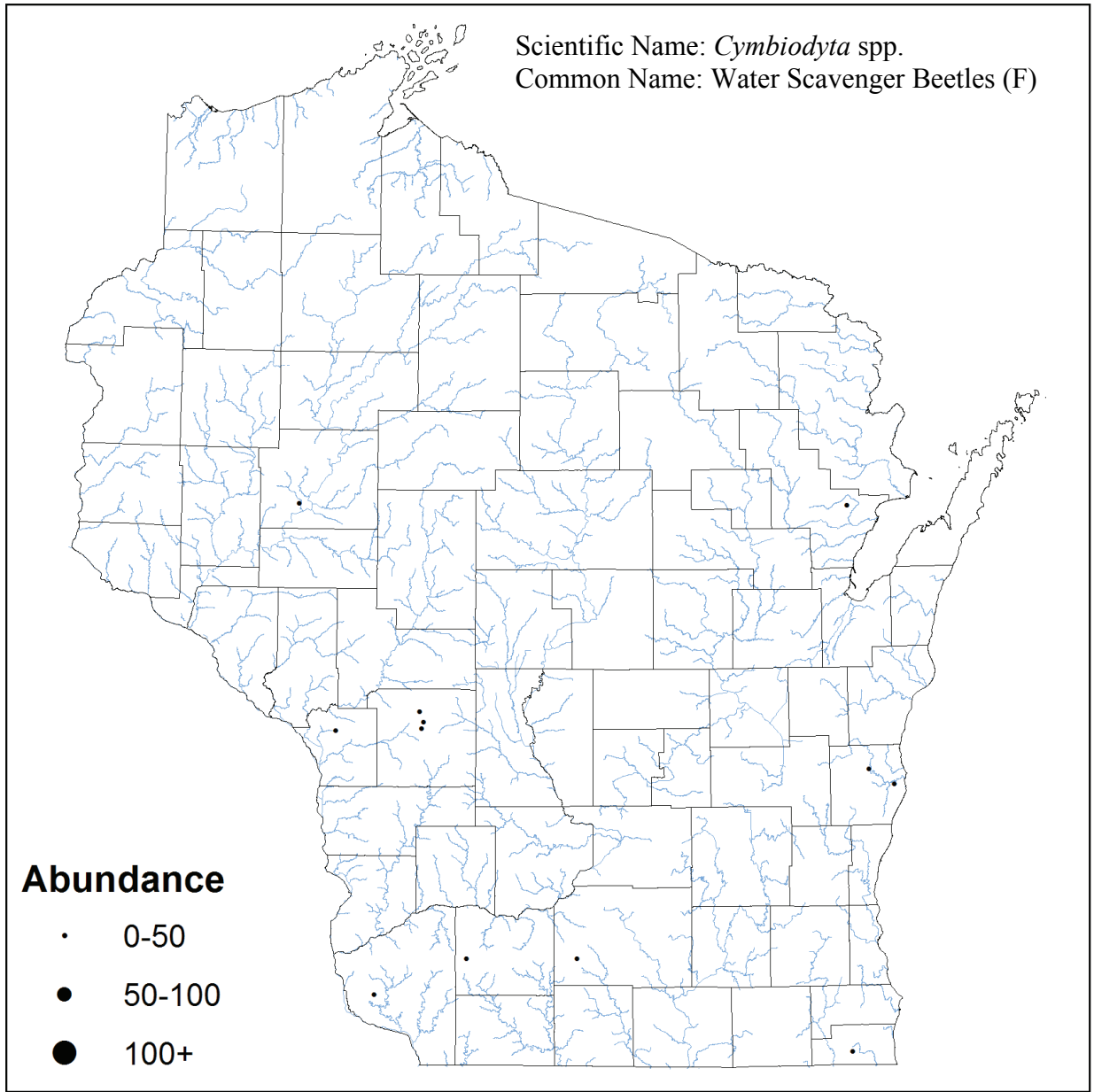


# Coleoptera Hydrophilidae

Scientific Name: *Crenitis* spp.  
 Common Name: Water Scavenger Beetles (F)

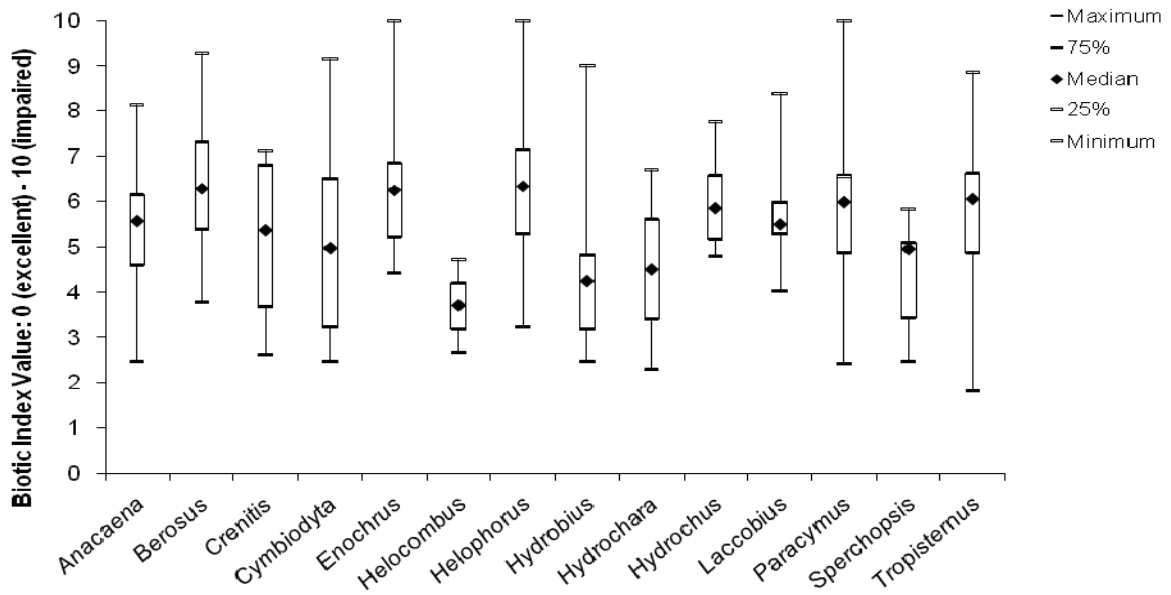
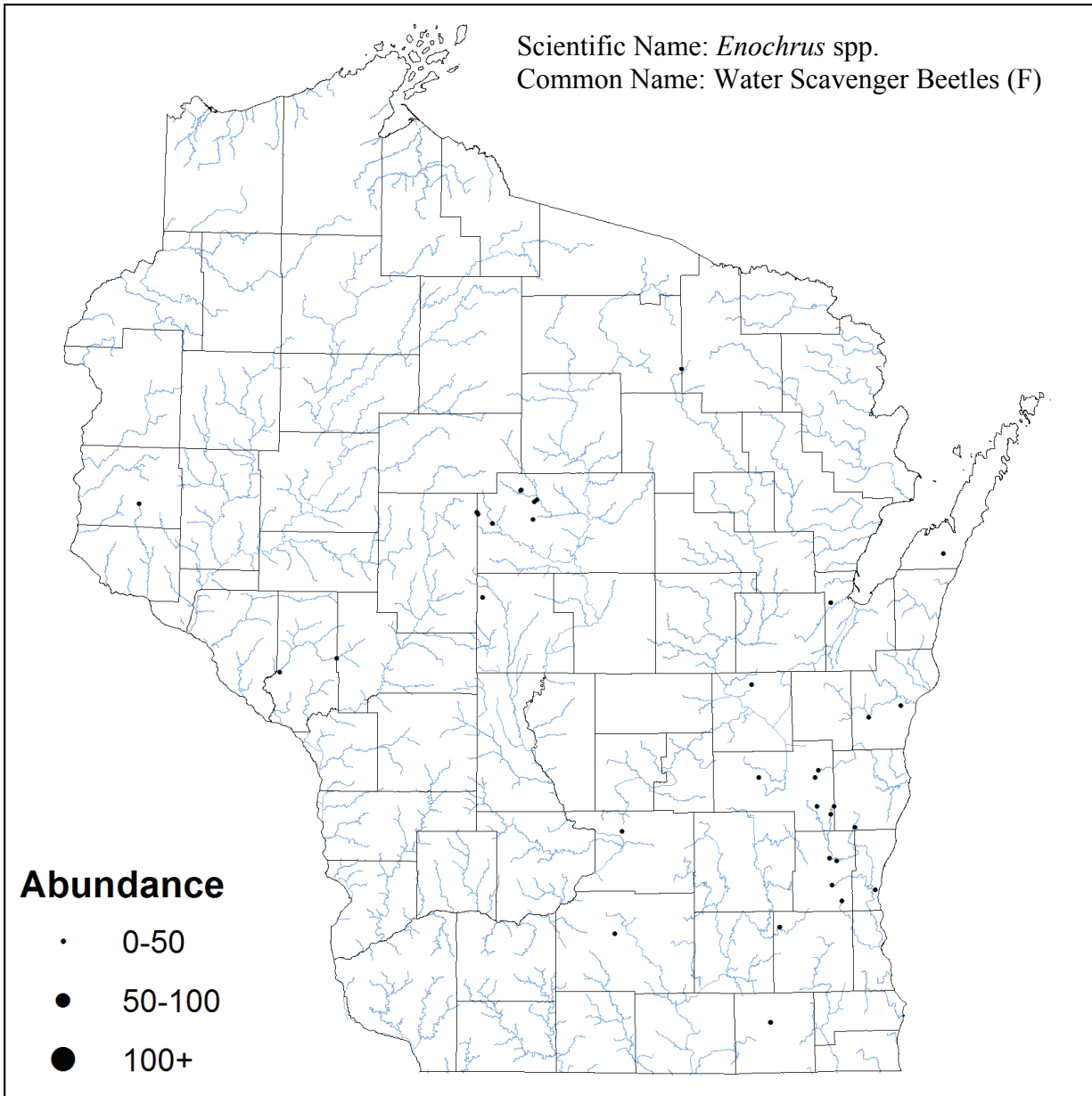


# Coleoptera Hydrophilidae



# Coleoptera Hydrophilidae

Scientific Name: *Enochrus* spp.  
 Common Name: Water Scavenger Beetles (F)

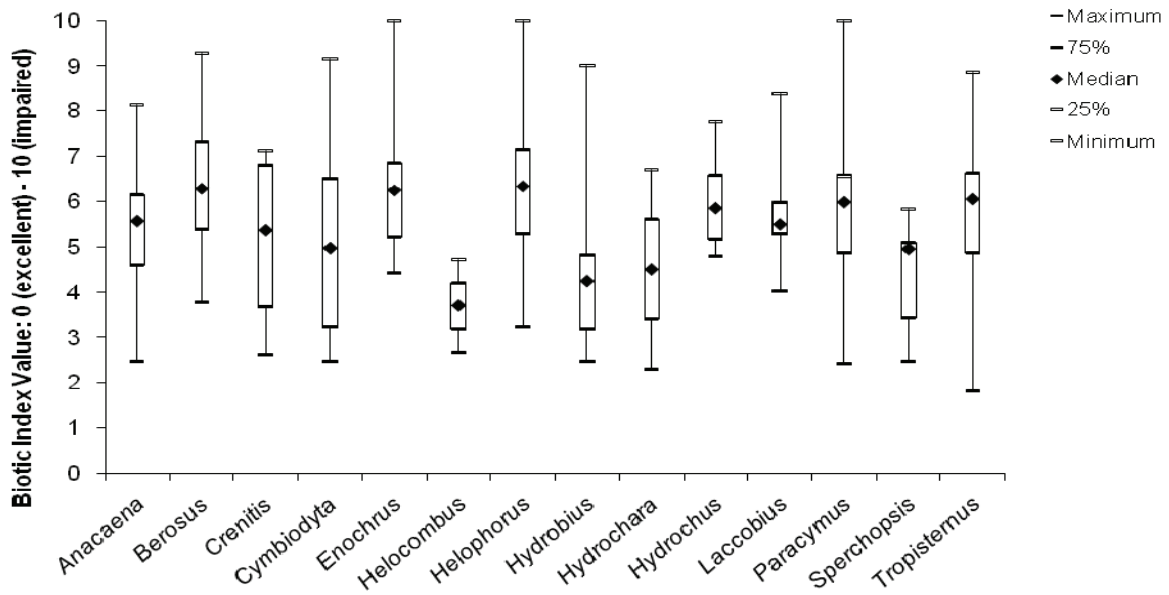
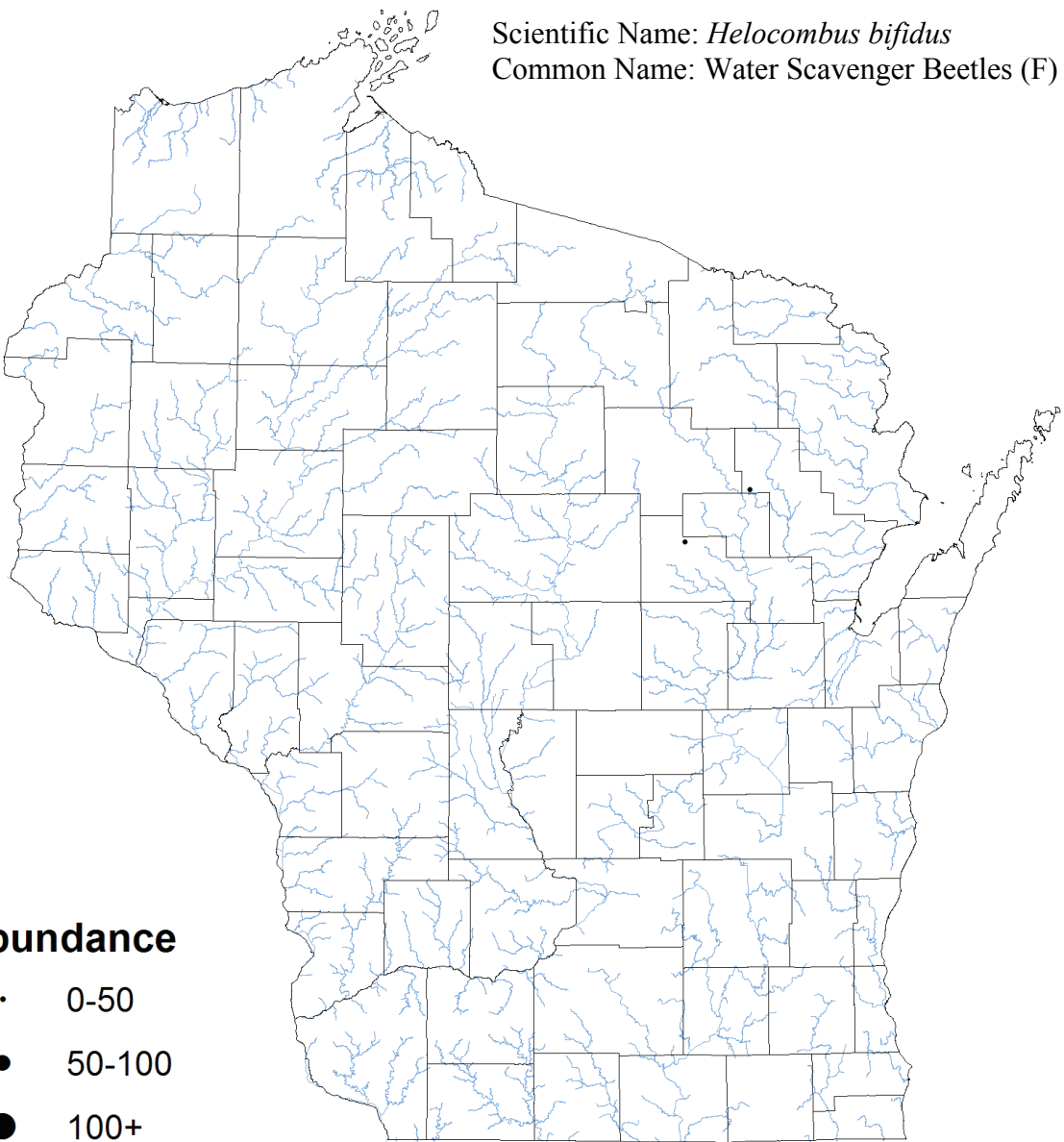


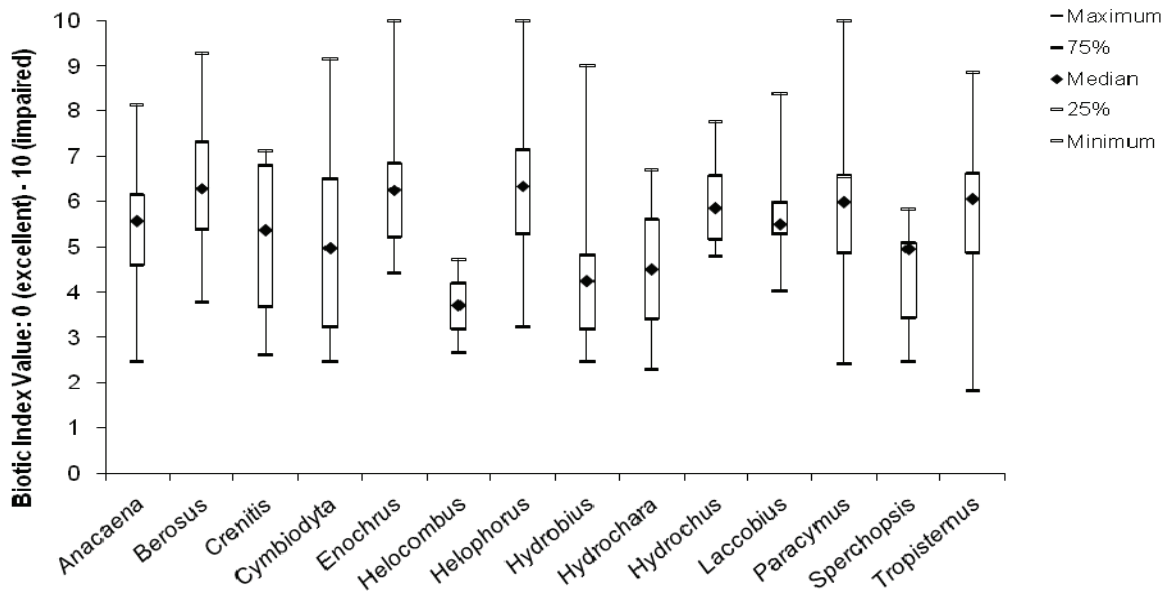
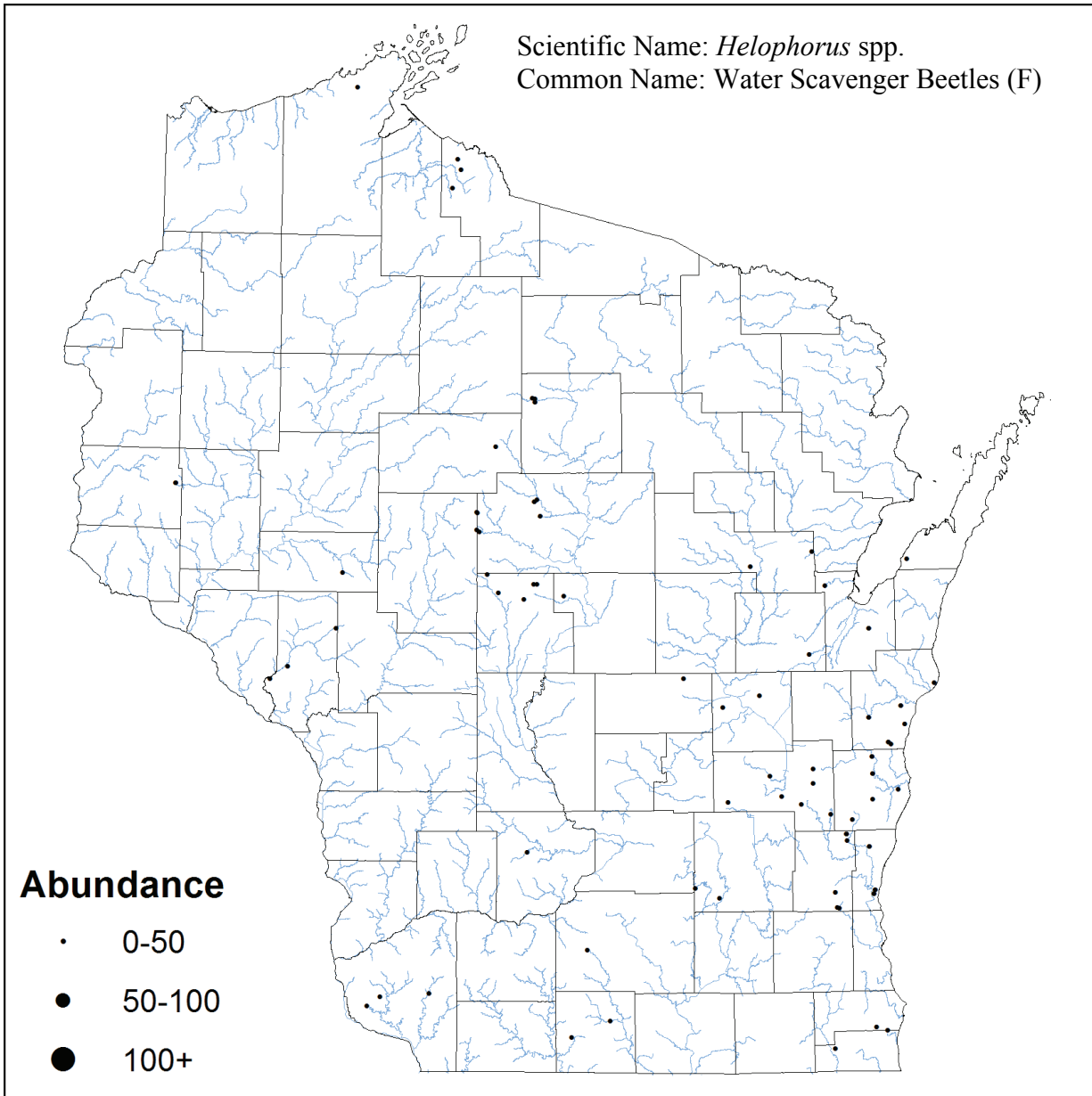
# Coleoptera Hydrophilidae

Scientific Name: *Helocombus bifidus*  
 Common Name: Water Scavenger Beetles (F)

## Abundance

- 0-50
- 50-100
- 100+



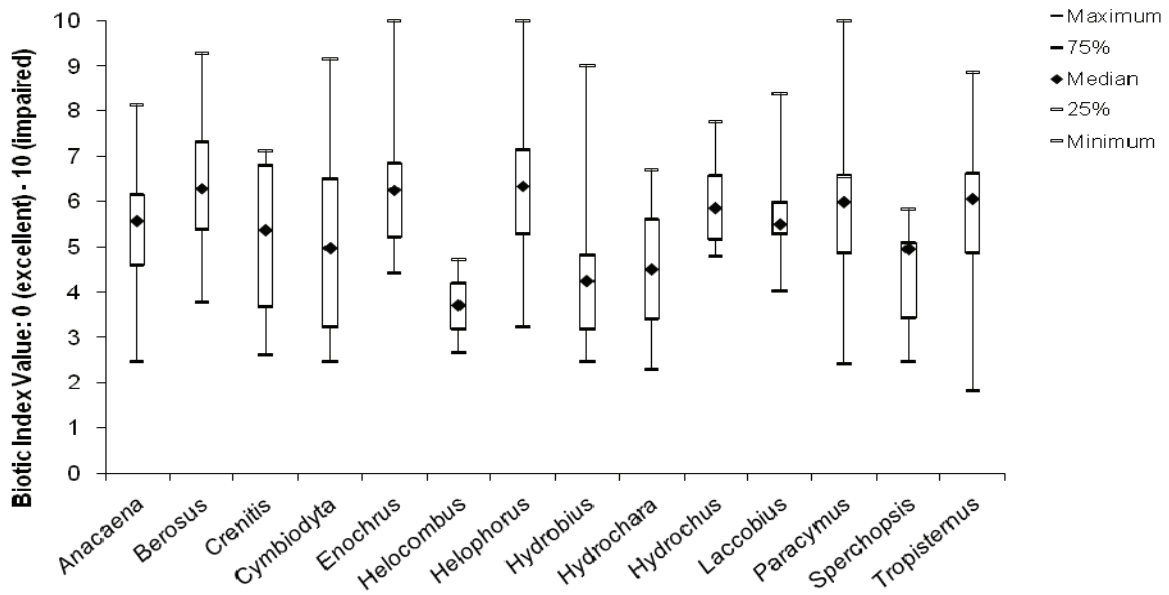
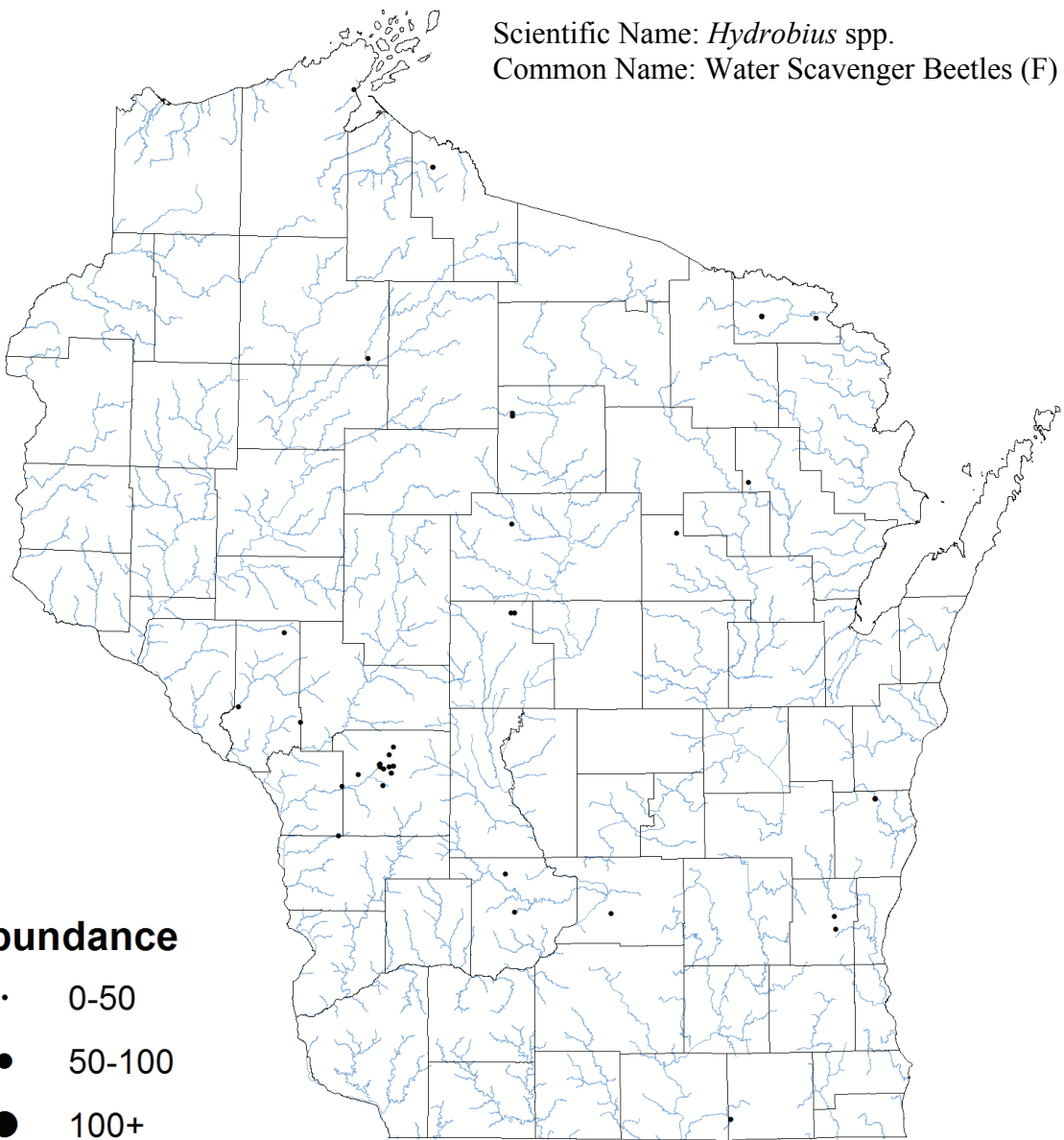


# Coleoptera Hydrophilidae

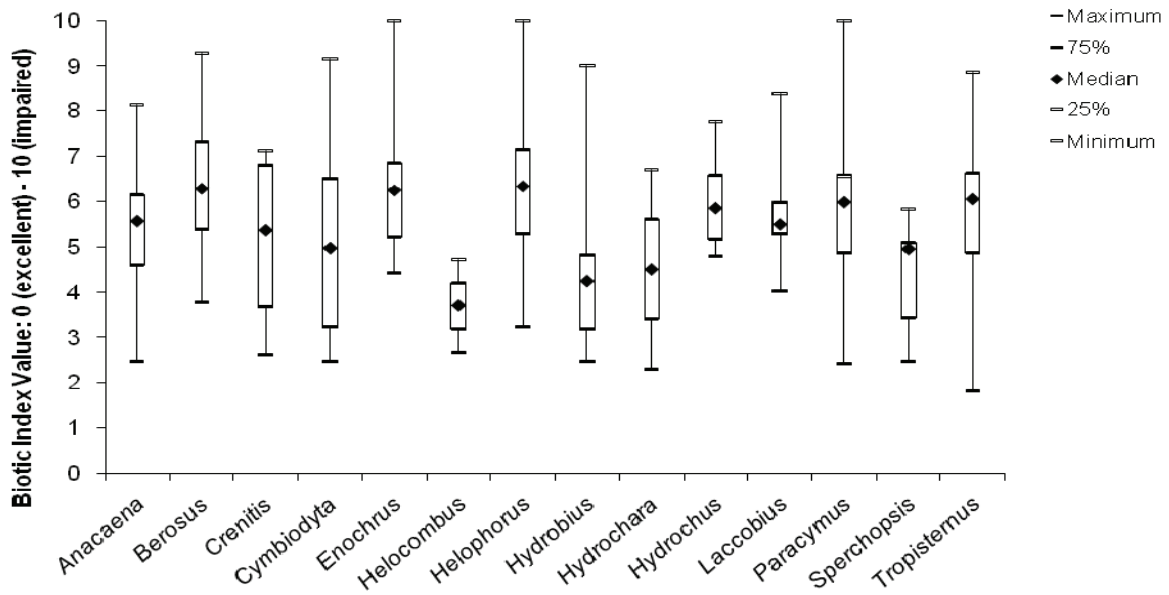
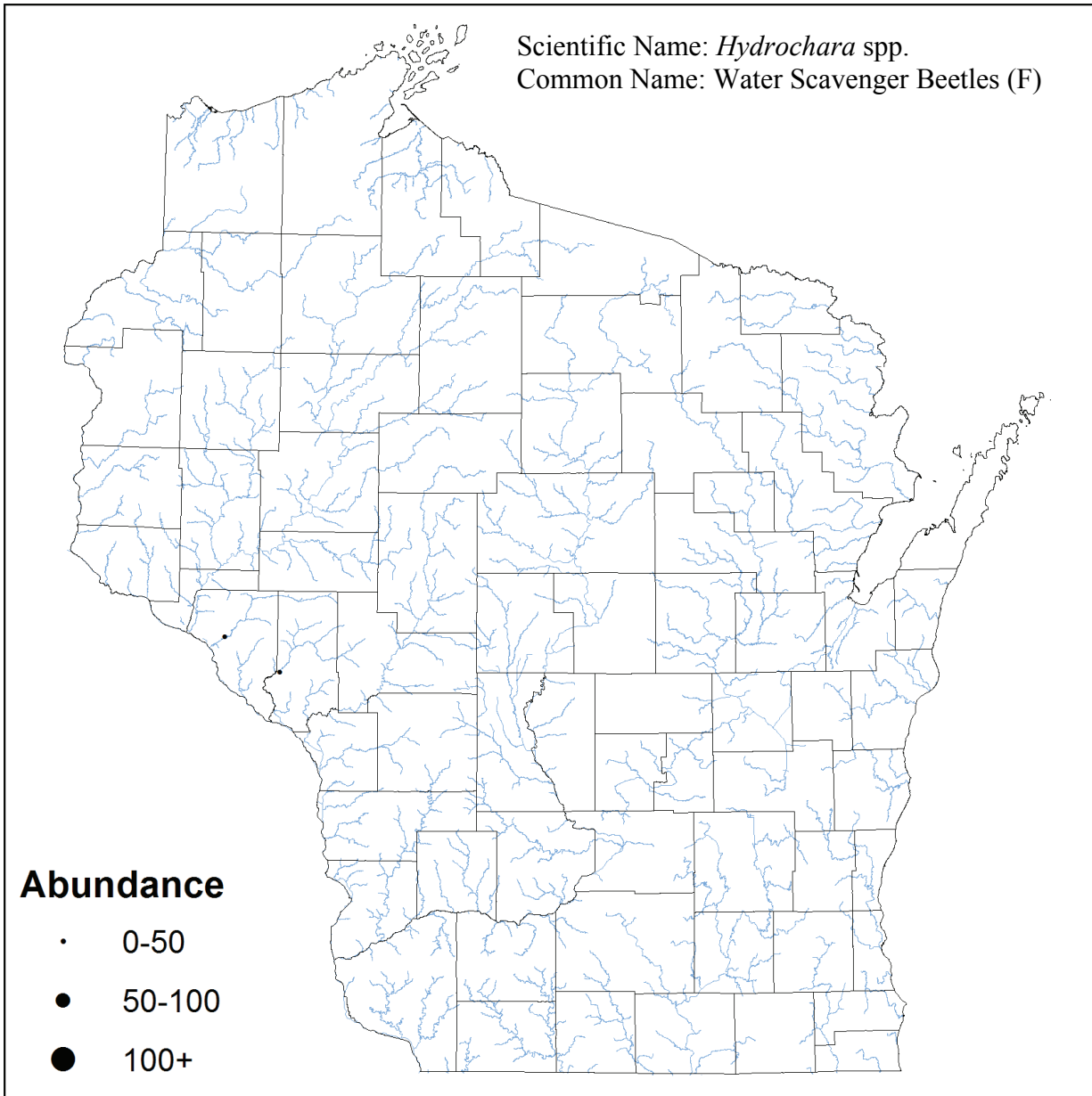
Scientific Name: *Hydrobius* spp.  
 Common Name: Water Scavenger Beetles (F)

## Abundance

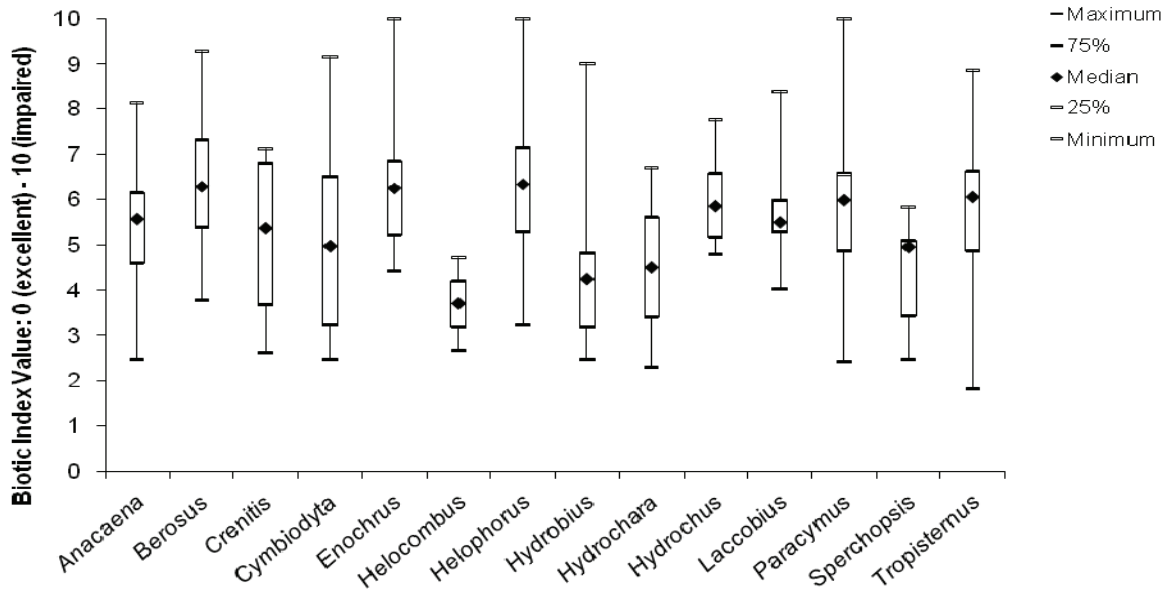
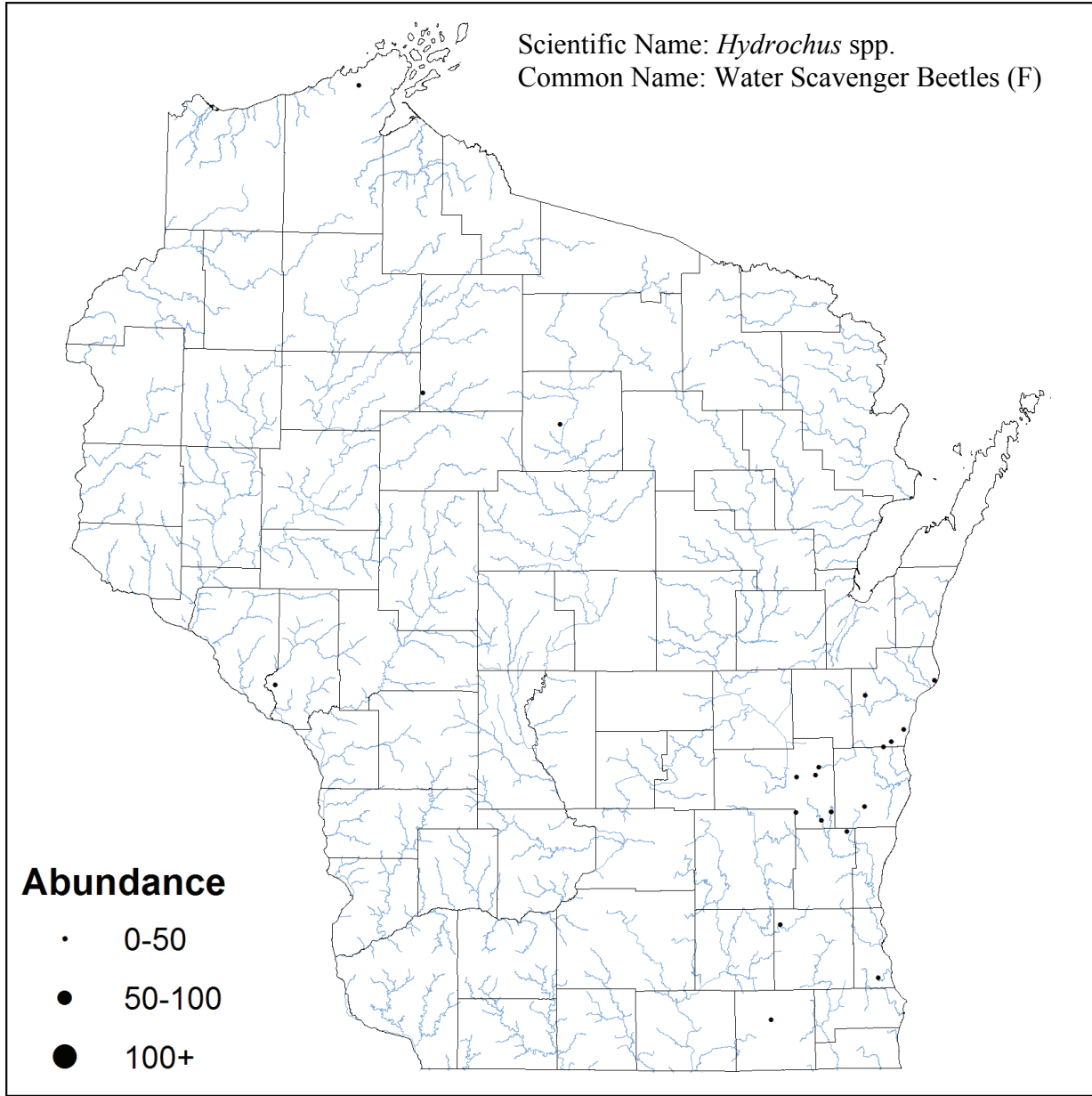
- 0-50
- 50-100
- 100+



# Coleoptera Hydrophilidae

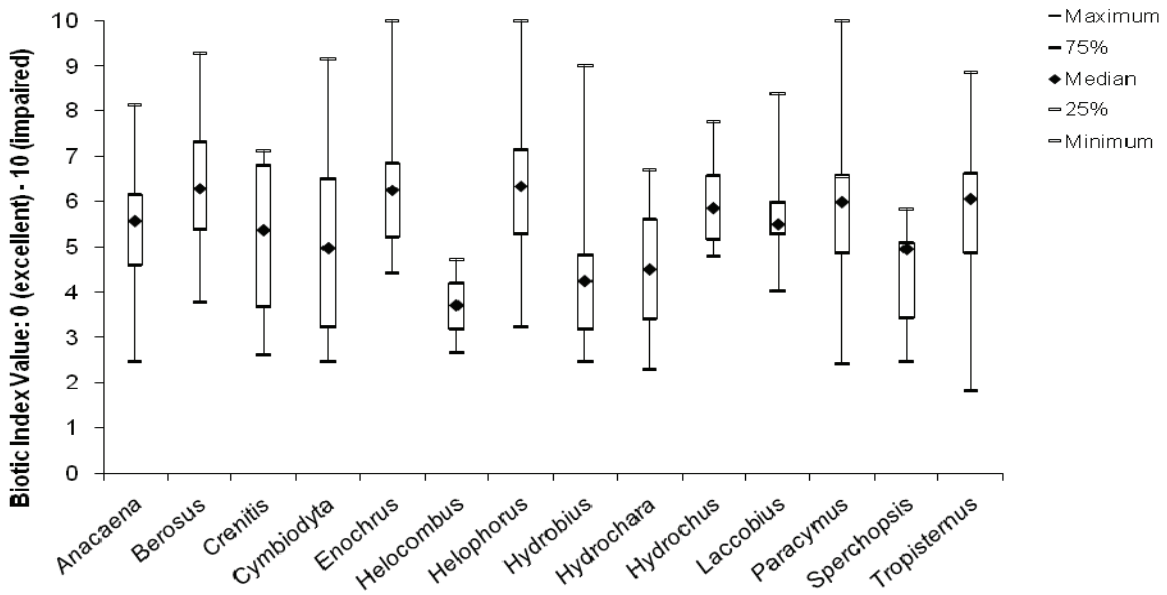
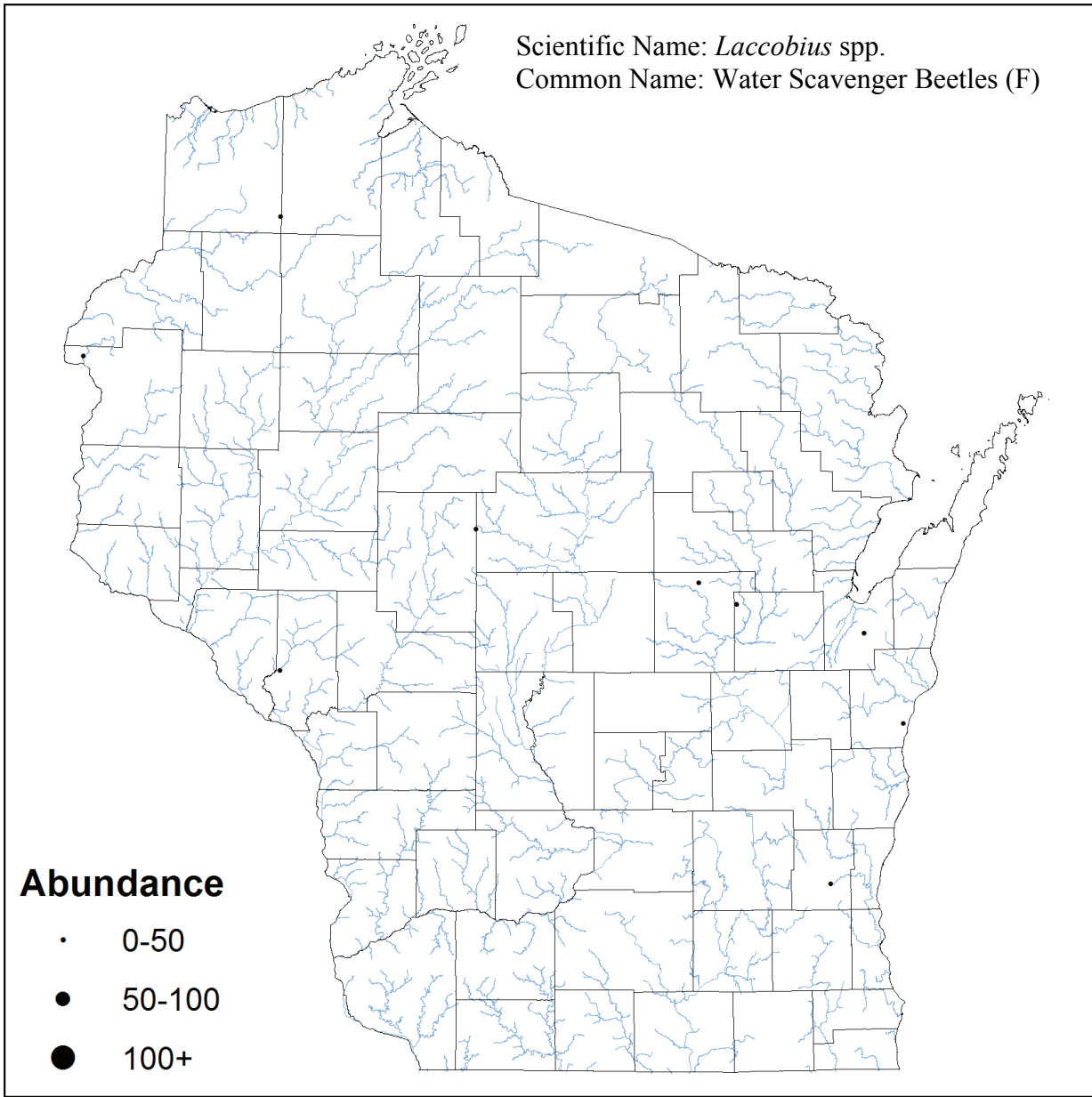


# Coleoptera Hydrophilidae





# Coleoptera Hydrophilidae

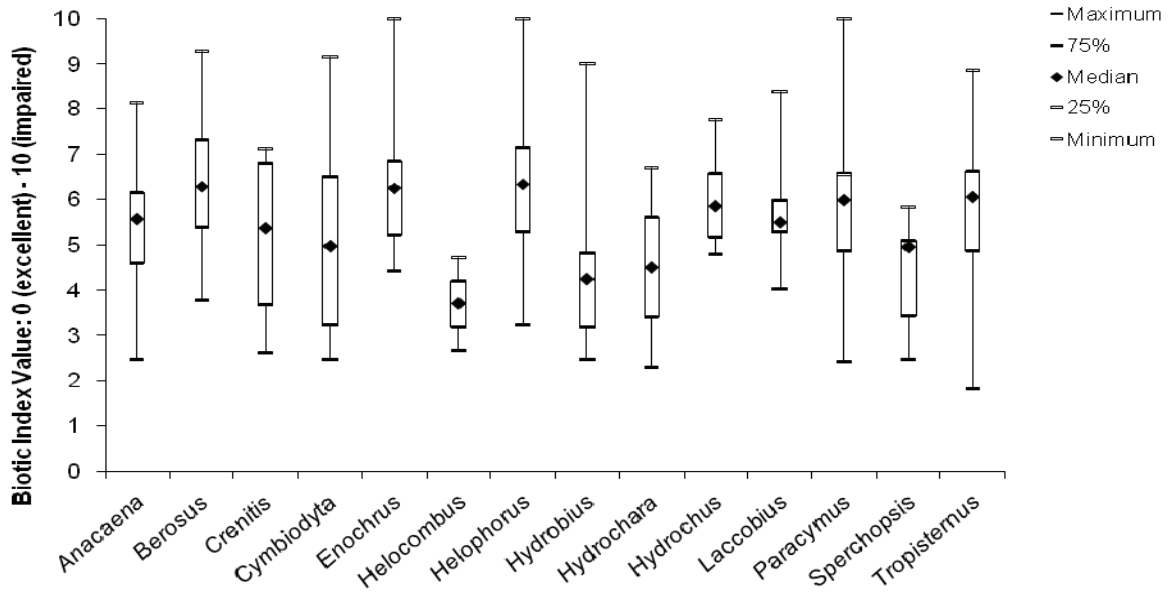
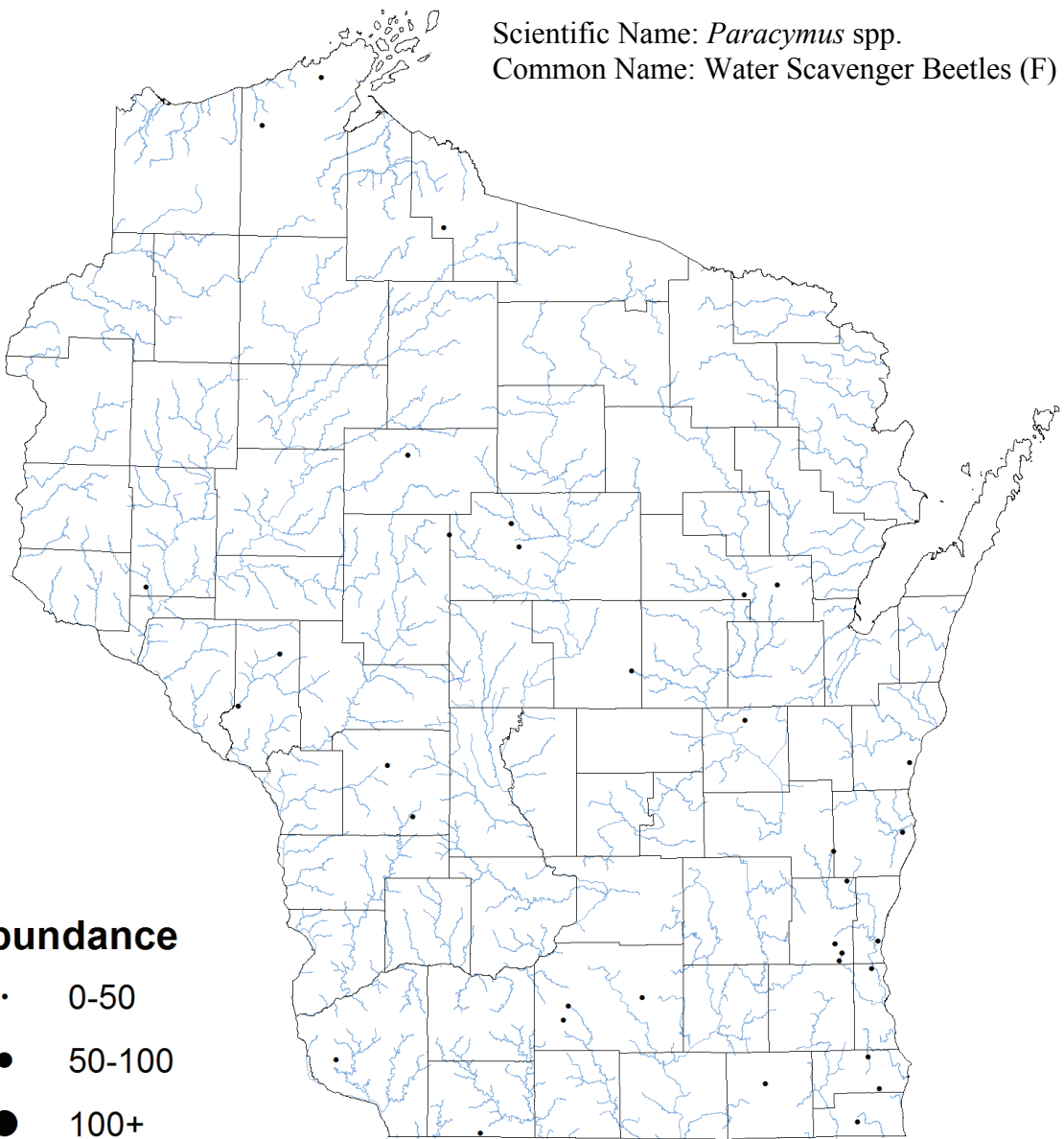


# Coleoptera Hydrophilidae

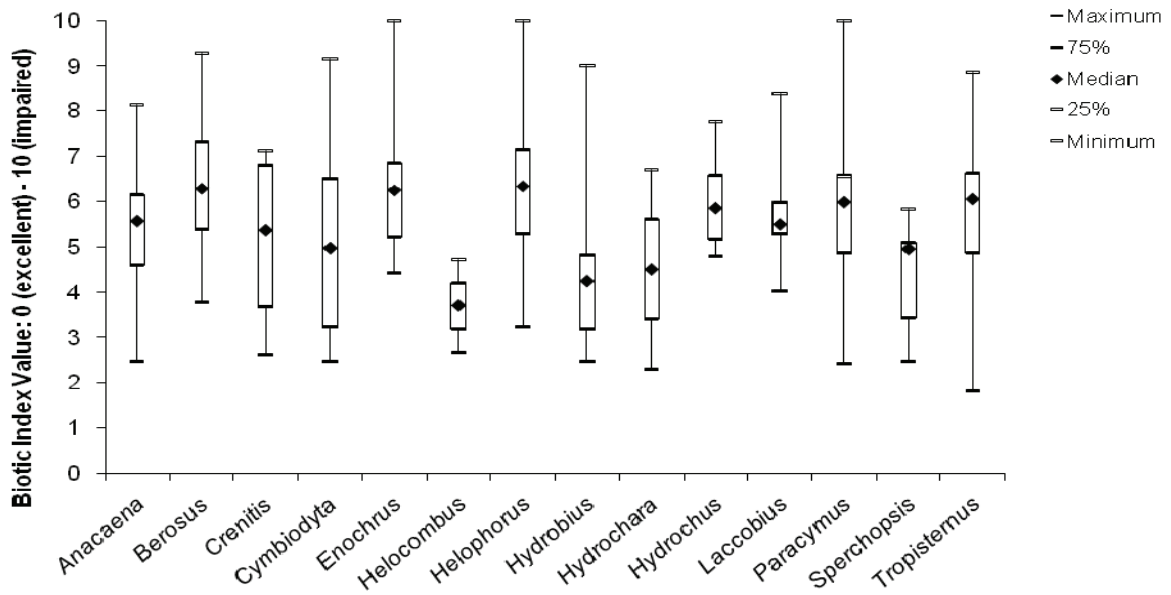
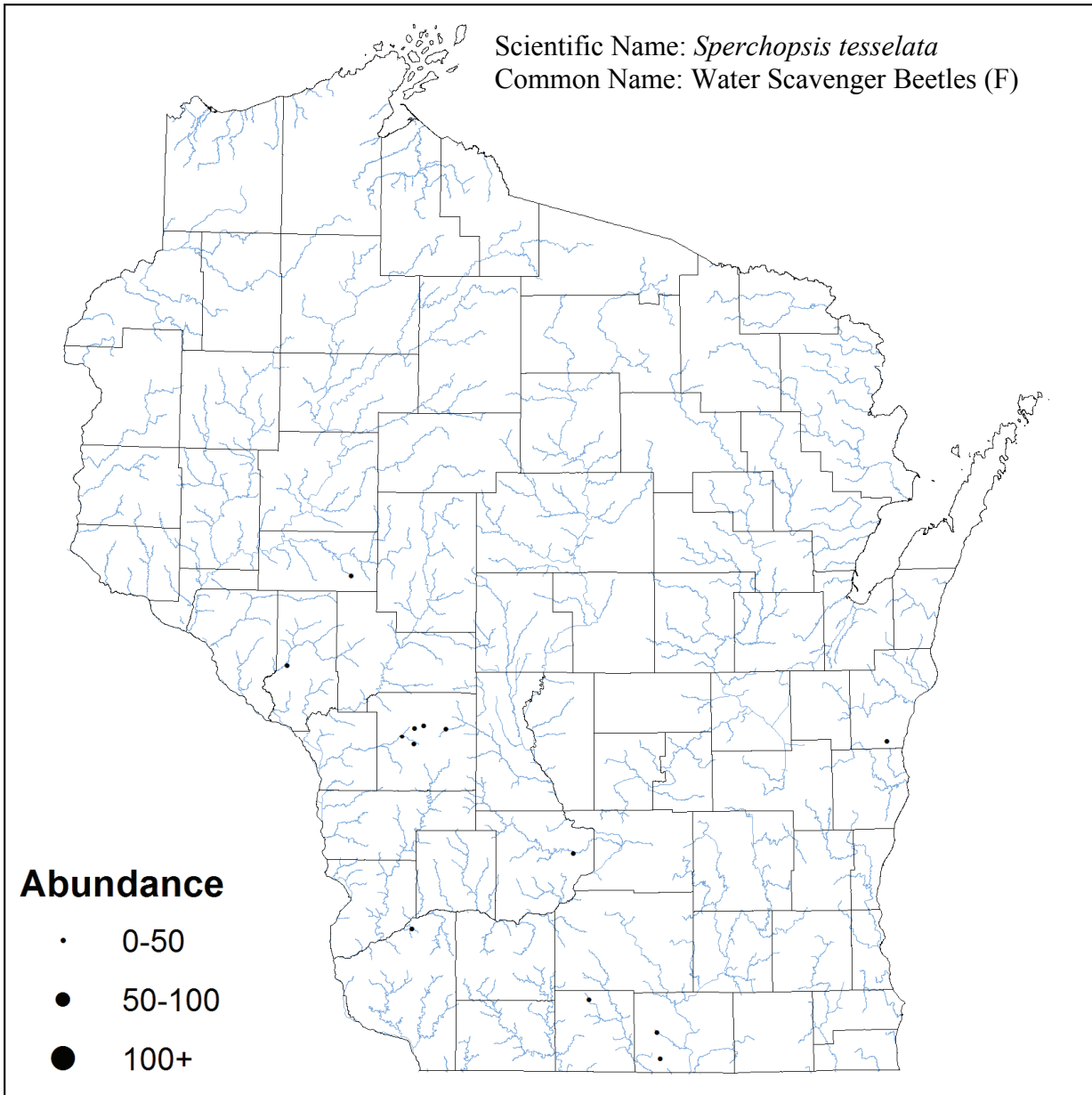
Scientific Name: *Paracymus* spp.  
 Common Name: Water Scavenger Beetles (F)

## Abundance

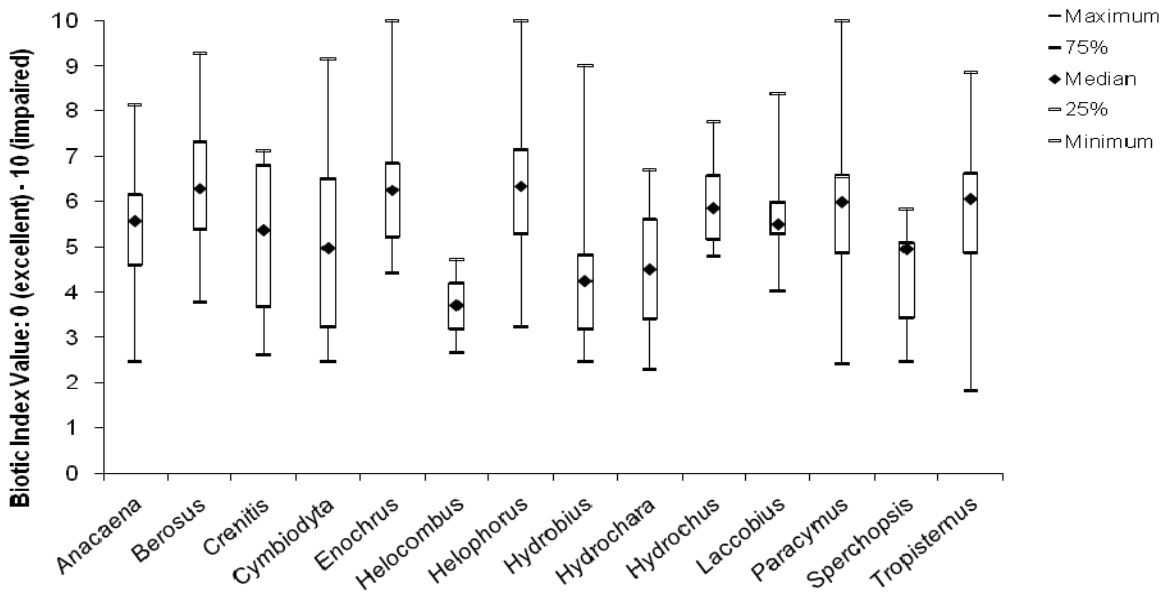
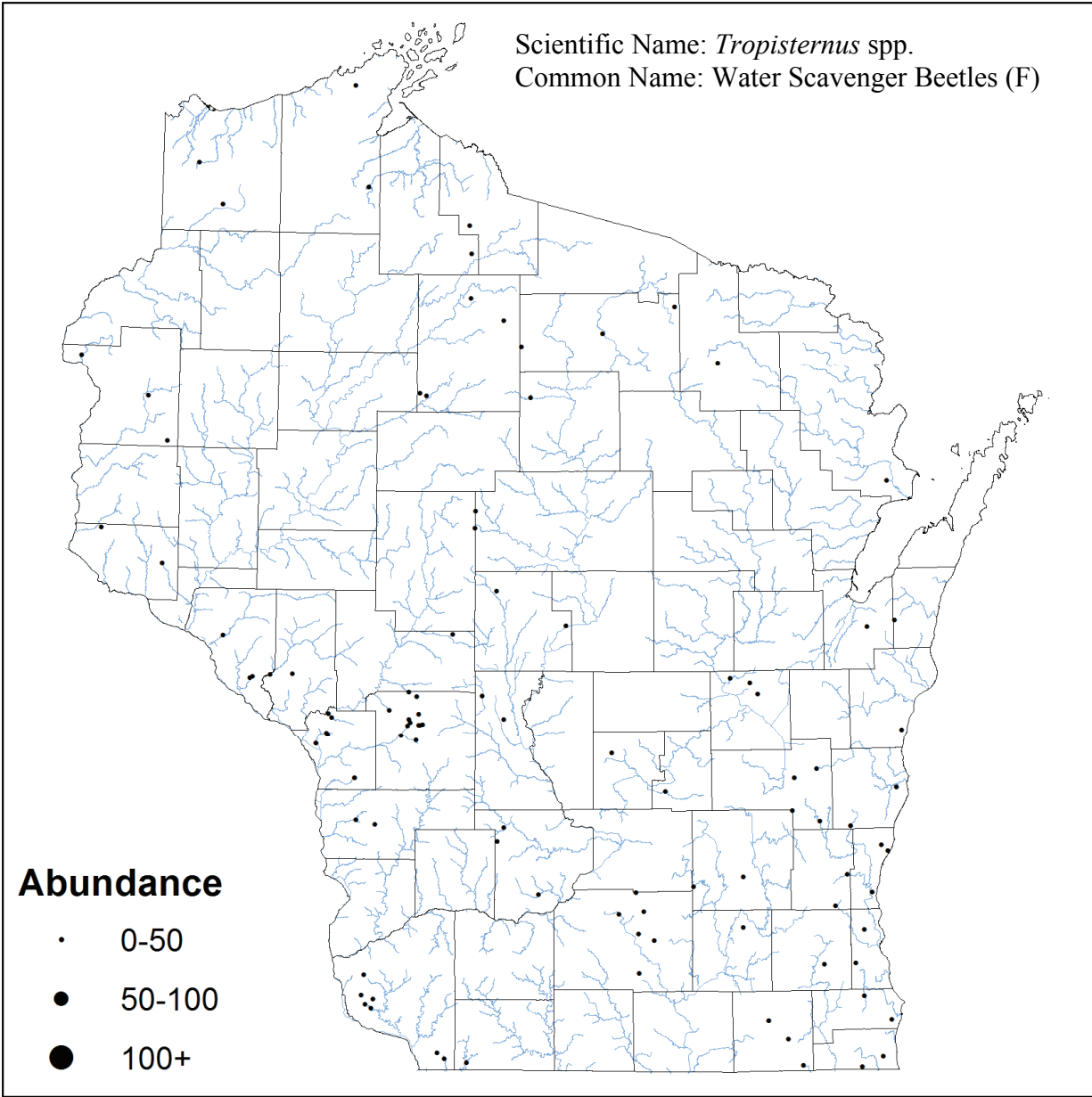
- 0-50
- 50-100
- 100+

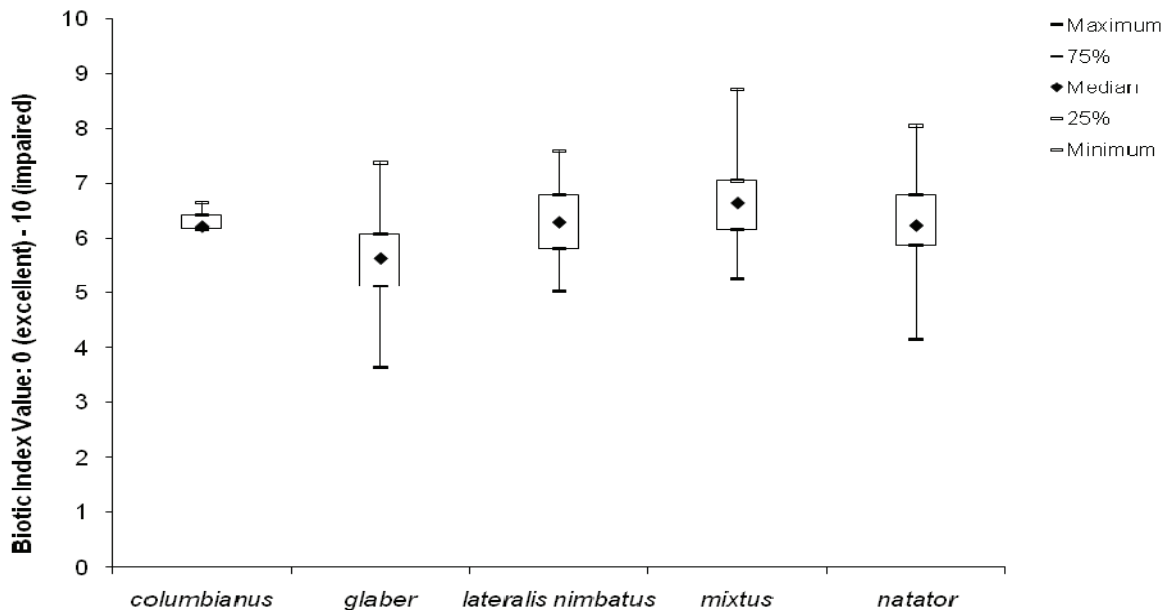
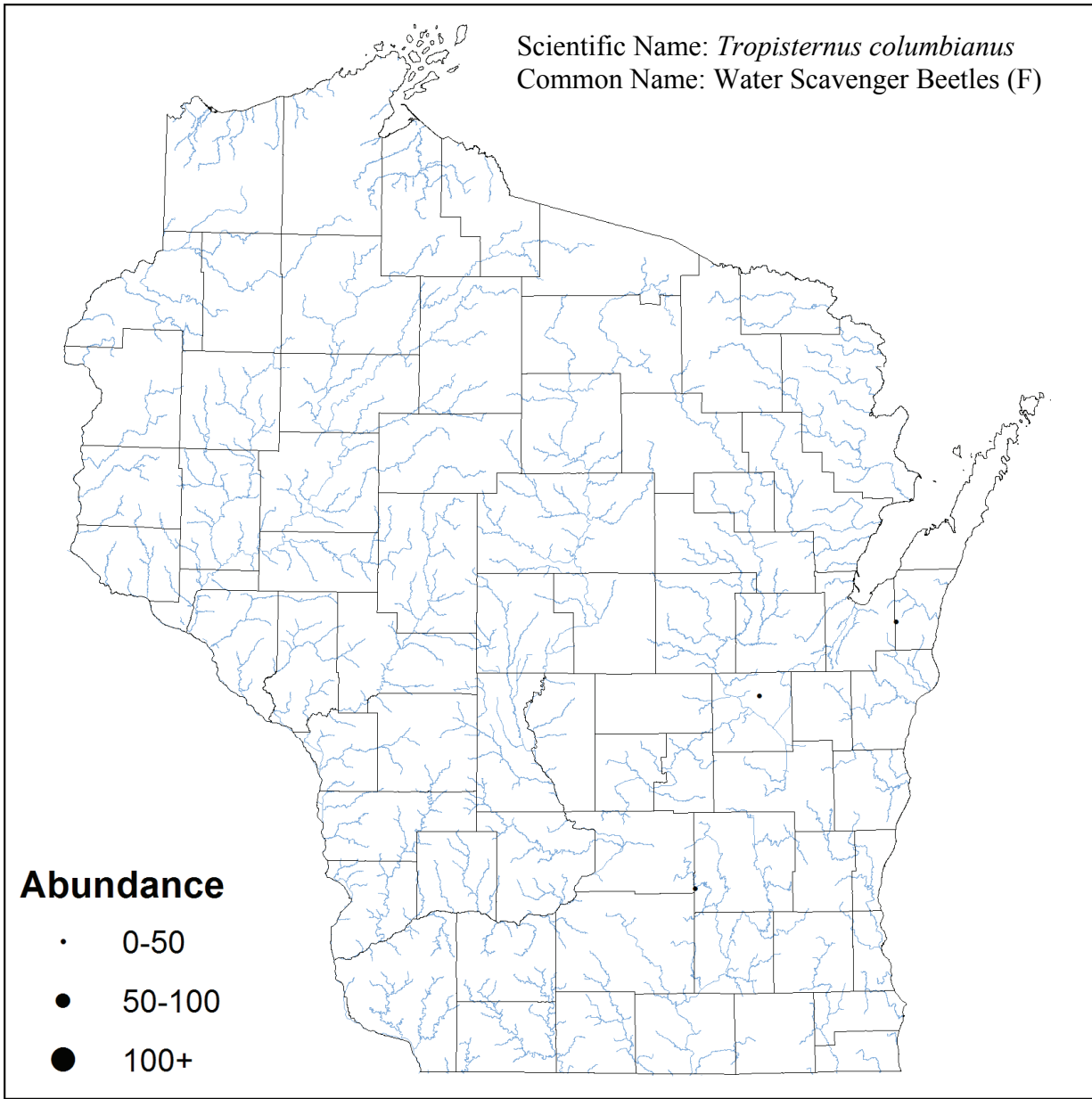


# Coleoptera Hydrophilidae

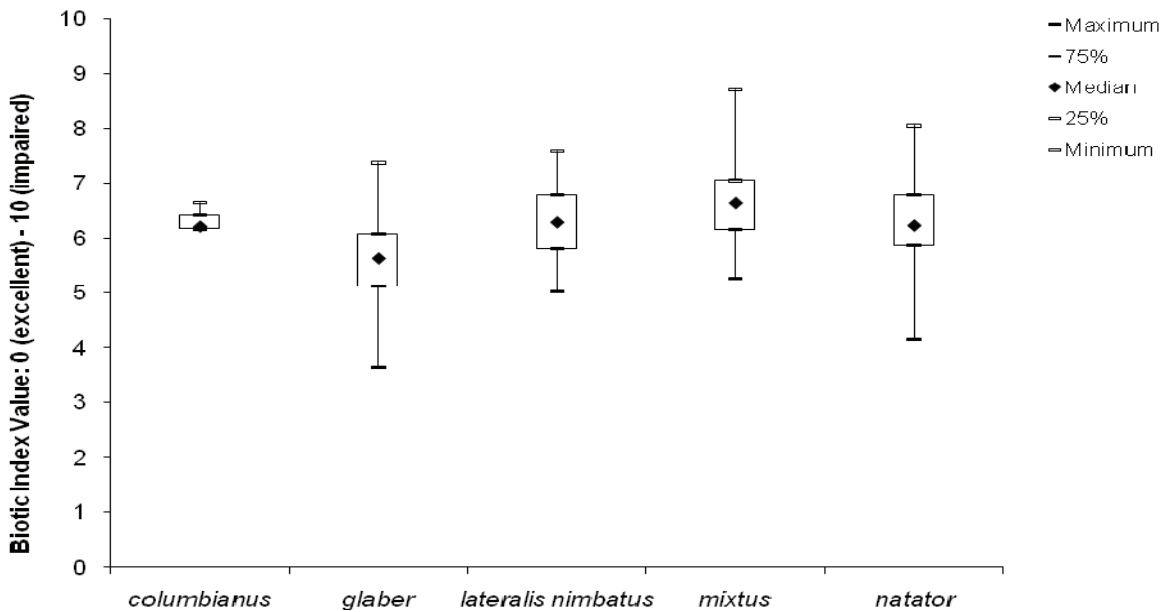
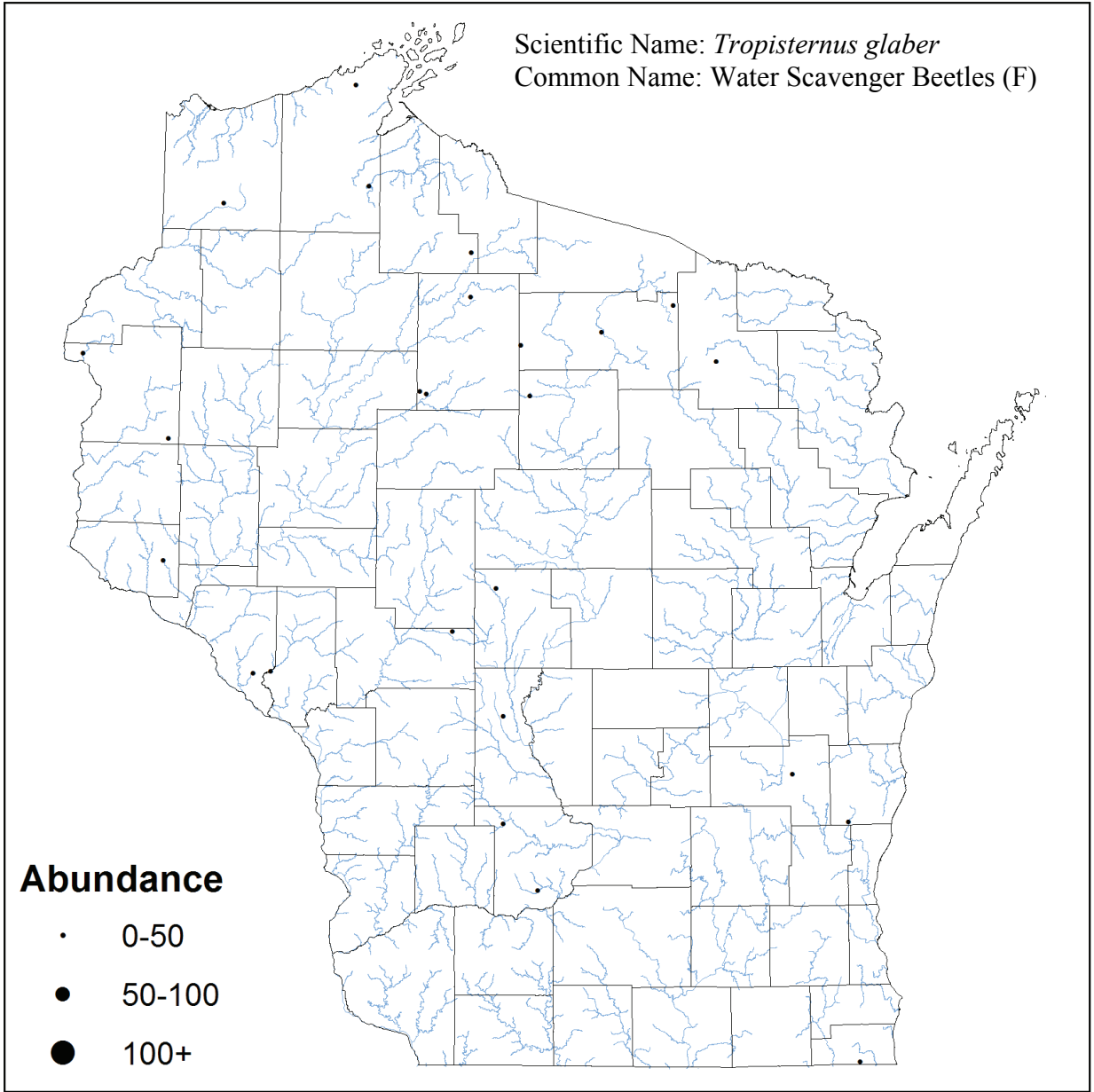


# Coleoptera Hydrophiliidae





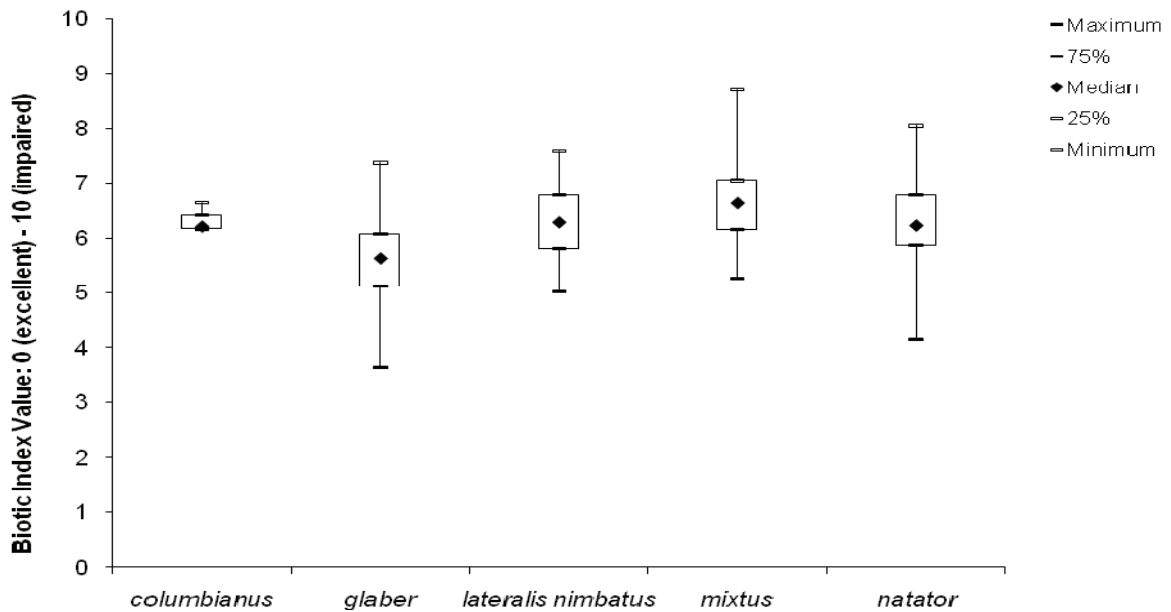
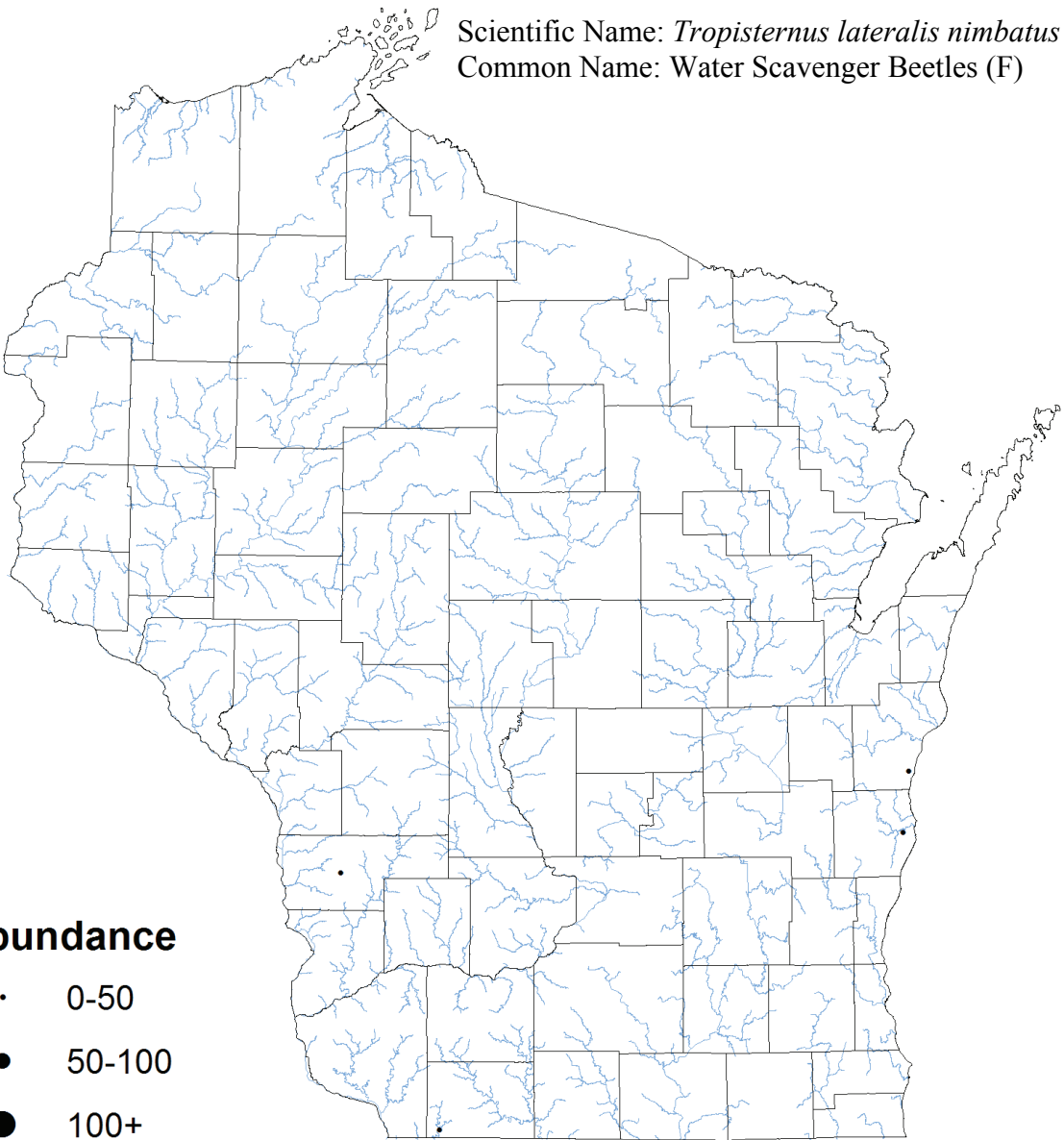
# Coleoptera Hydrophilidae



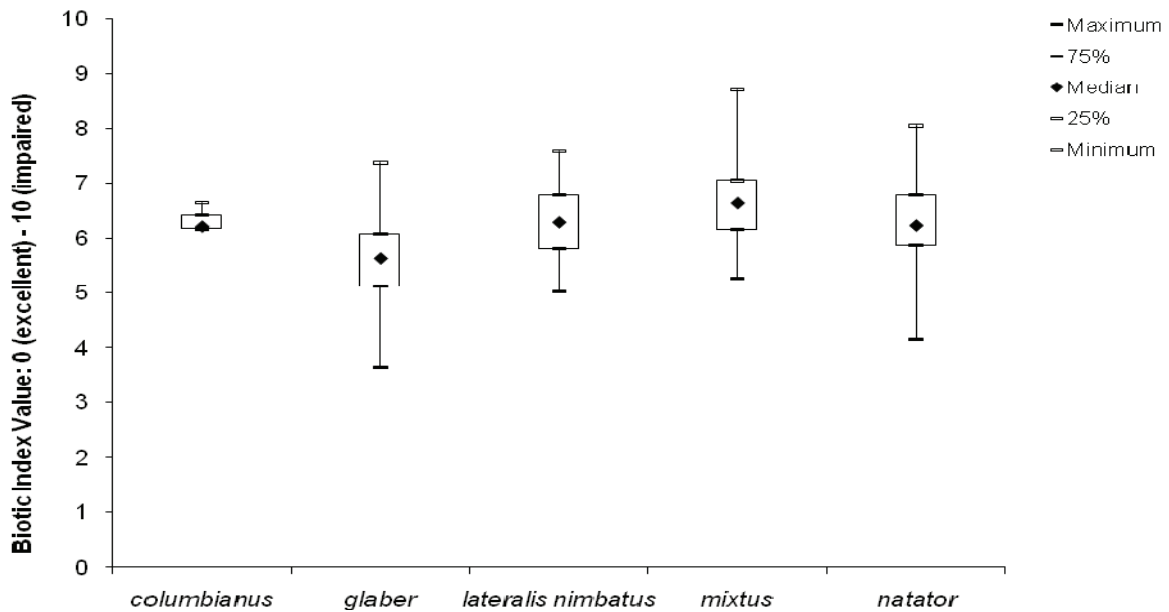
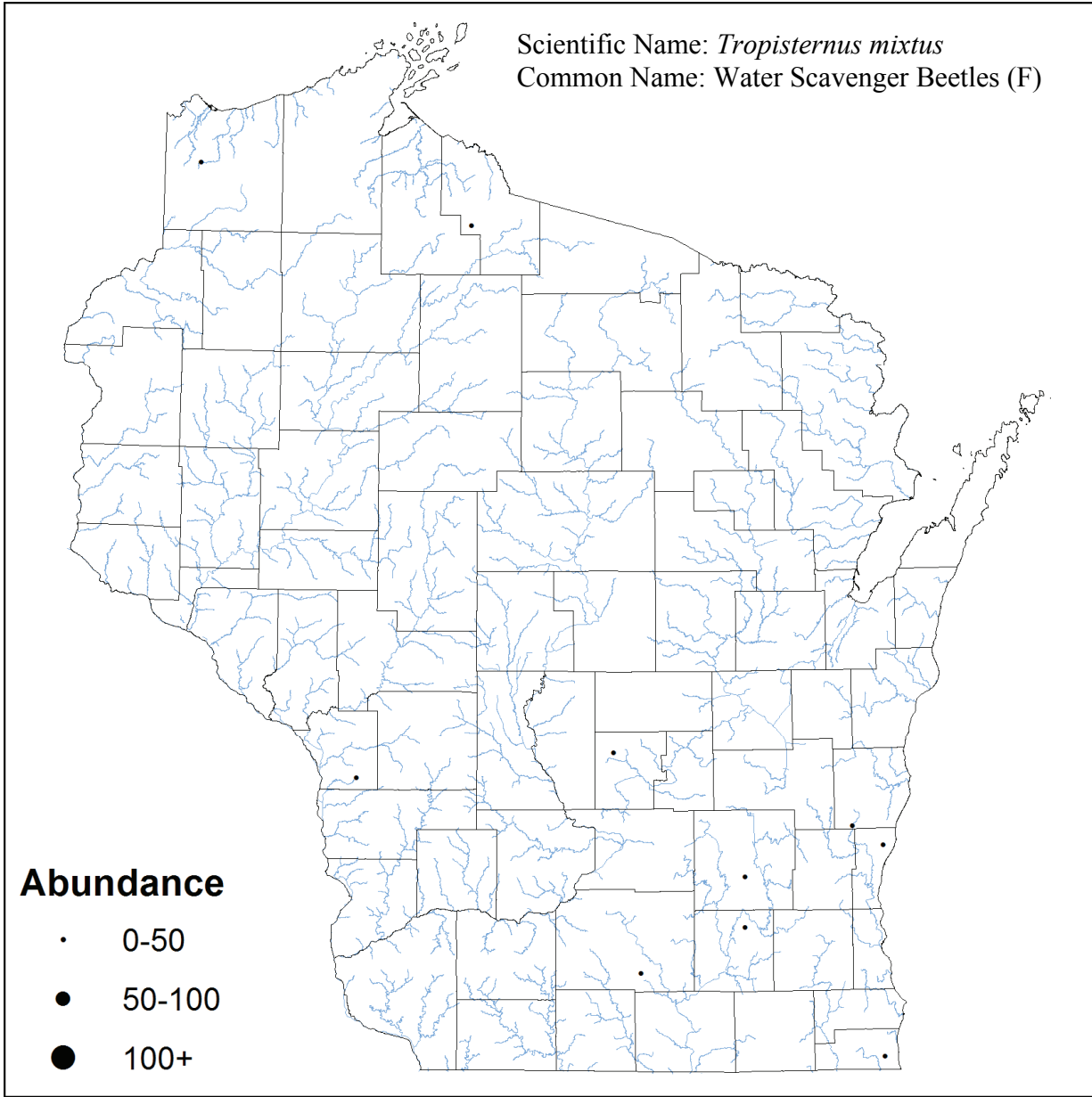
Scientific Name: *Tropisternus lateralis nimbatus*  
 Common Name: Water Scavenger Beetles (F)

**Abundance**

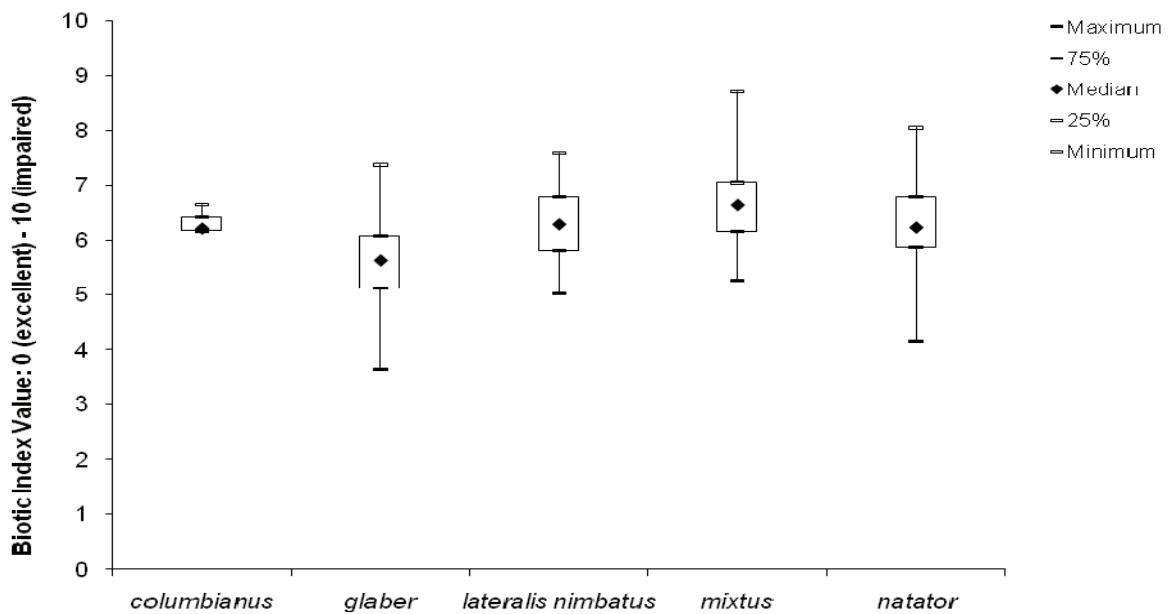
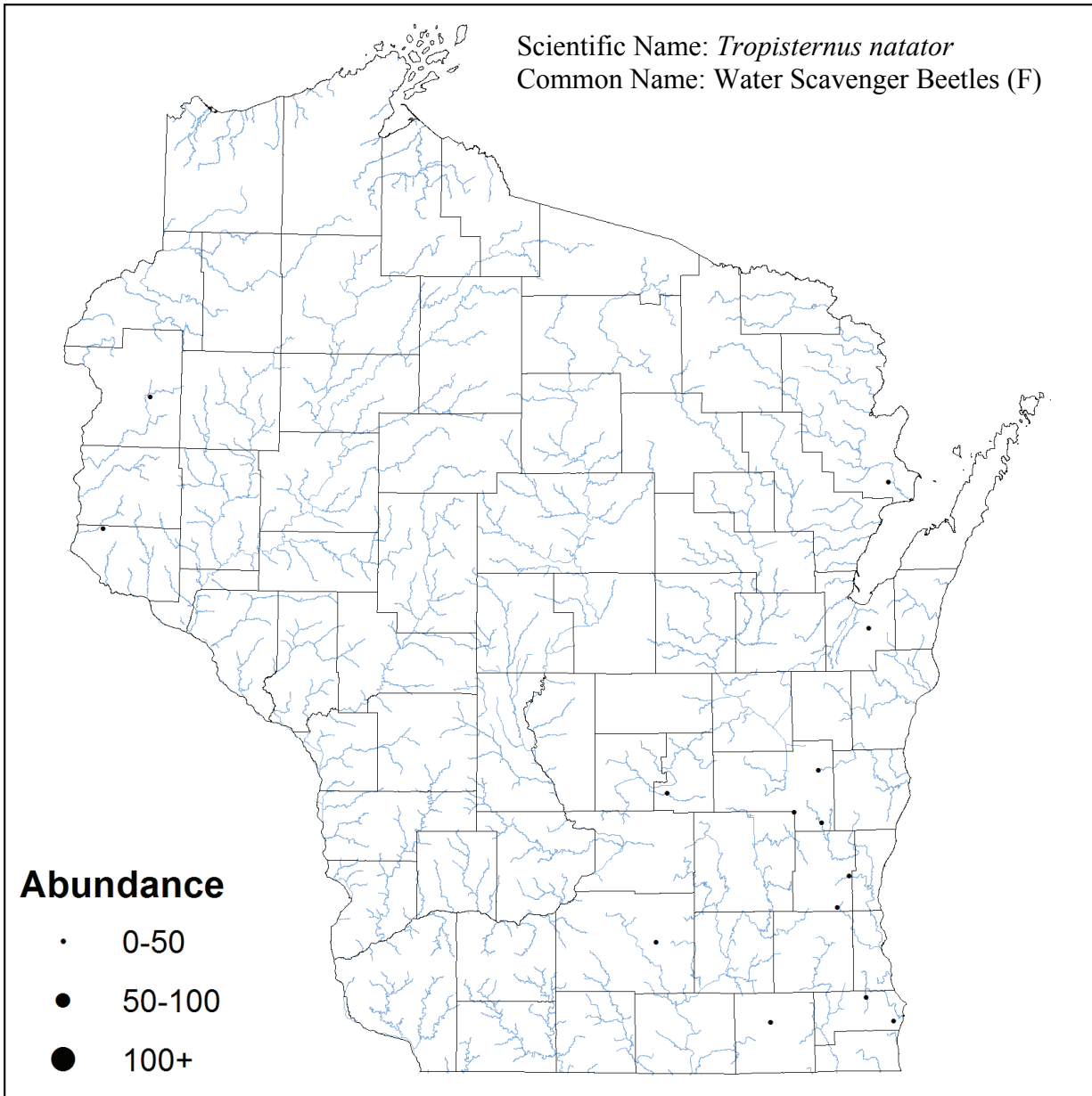
- 0-50
- 50-100
- 100+



# Coleoptera Hydrophilidae





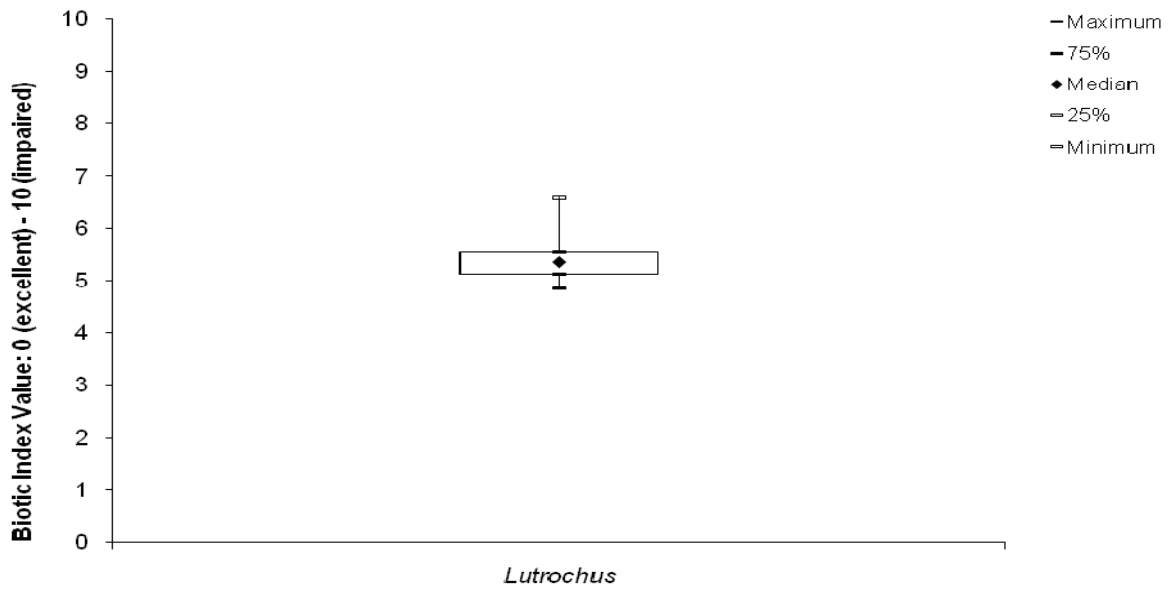
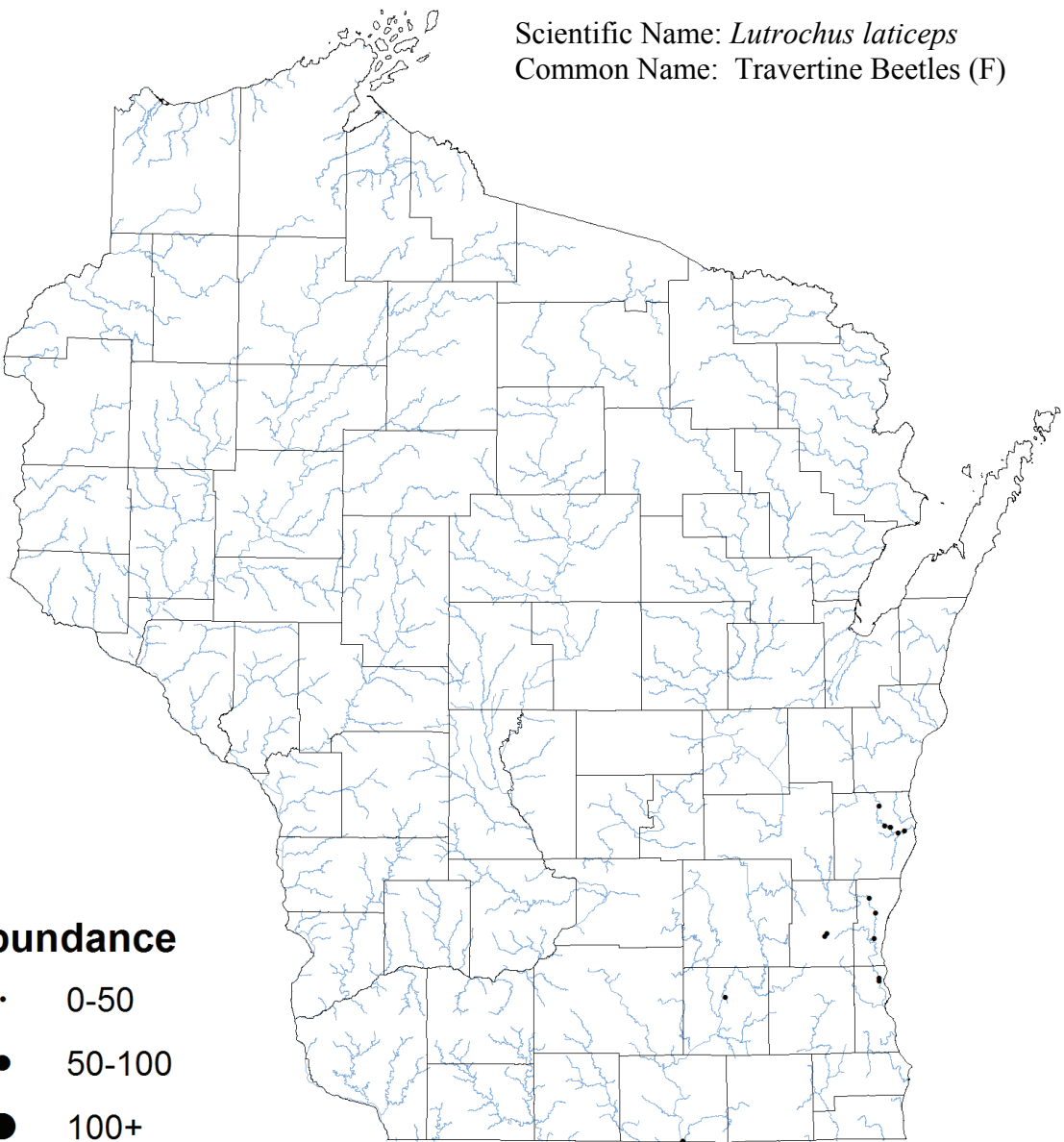


# Coleoptera Lutrochidae

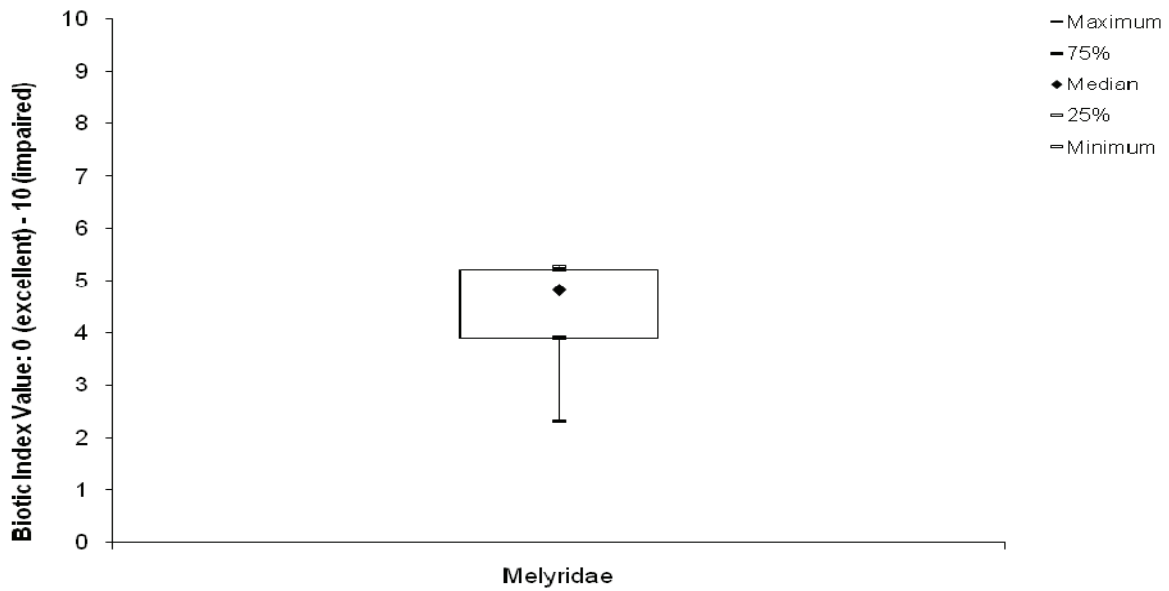
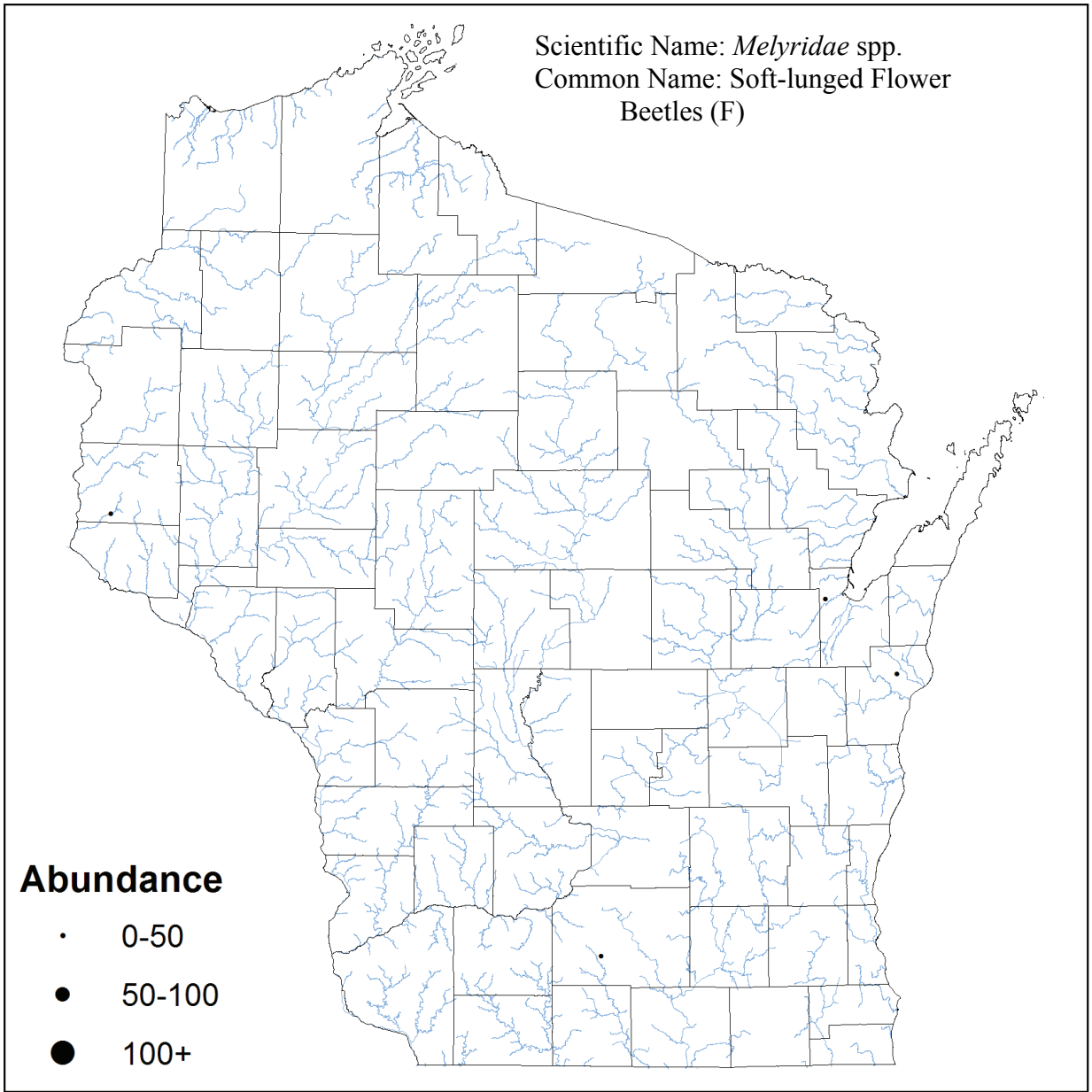
Scientific Name: *Lutrochus laticeps*  
Common Name: Travertine Beetles (F)

## Abundance

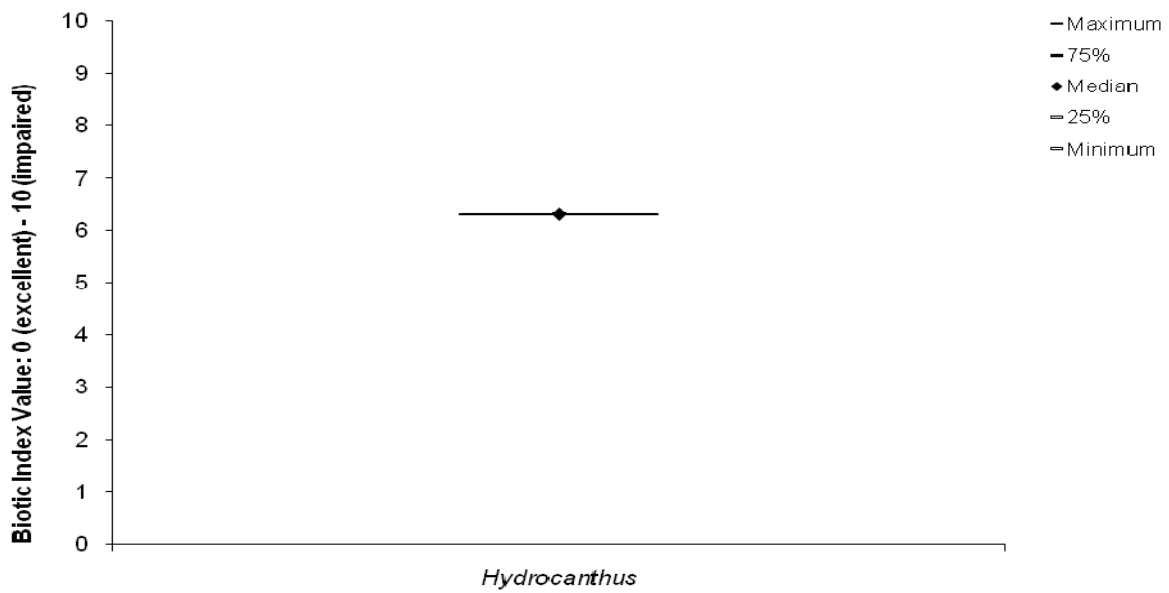
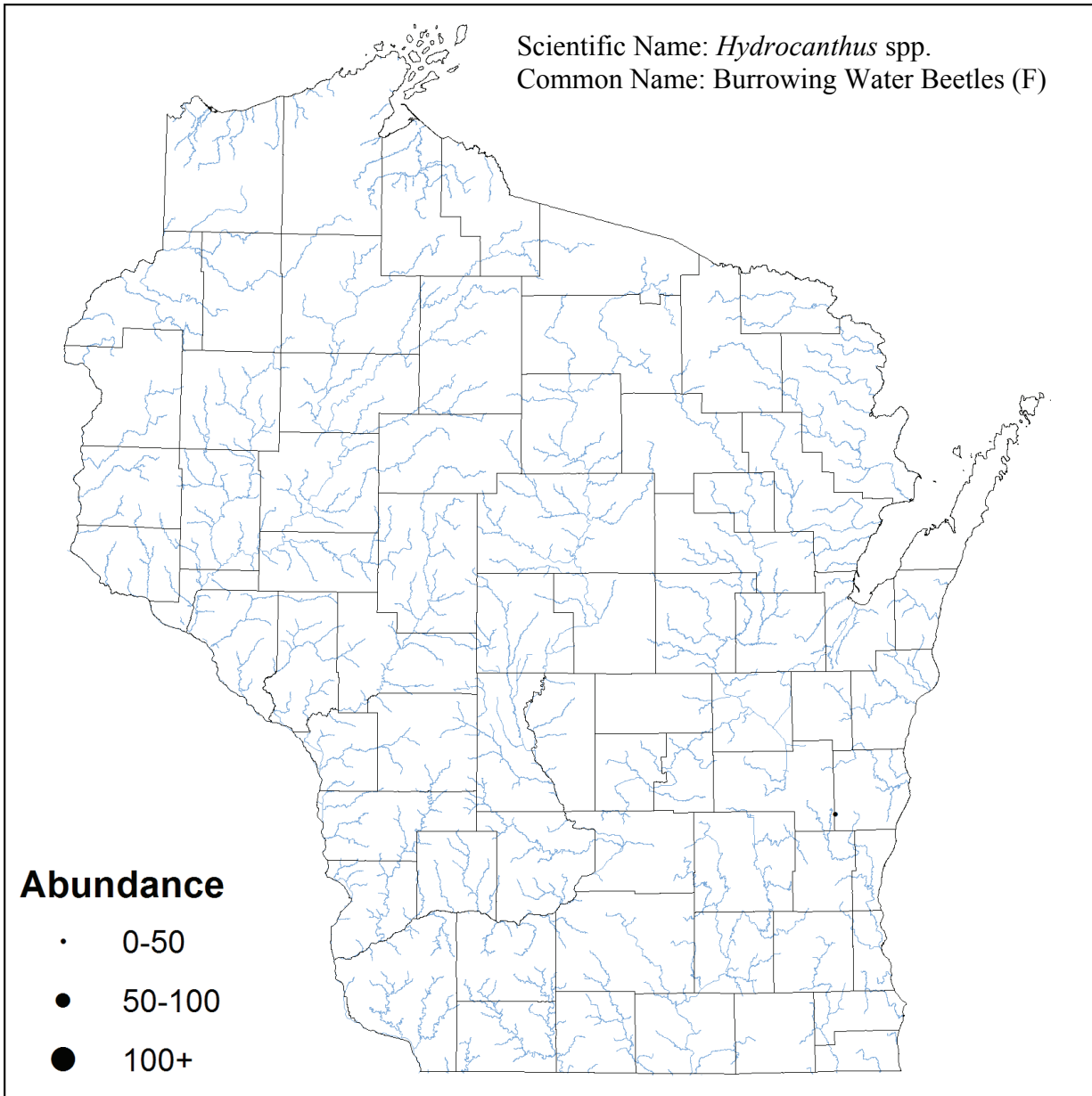
- 0-50
- 50-100
- 100+



# Coleoptera Melyridae



# Coleoptera Noteridae

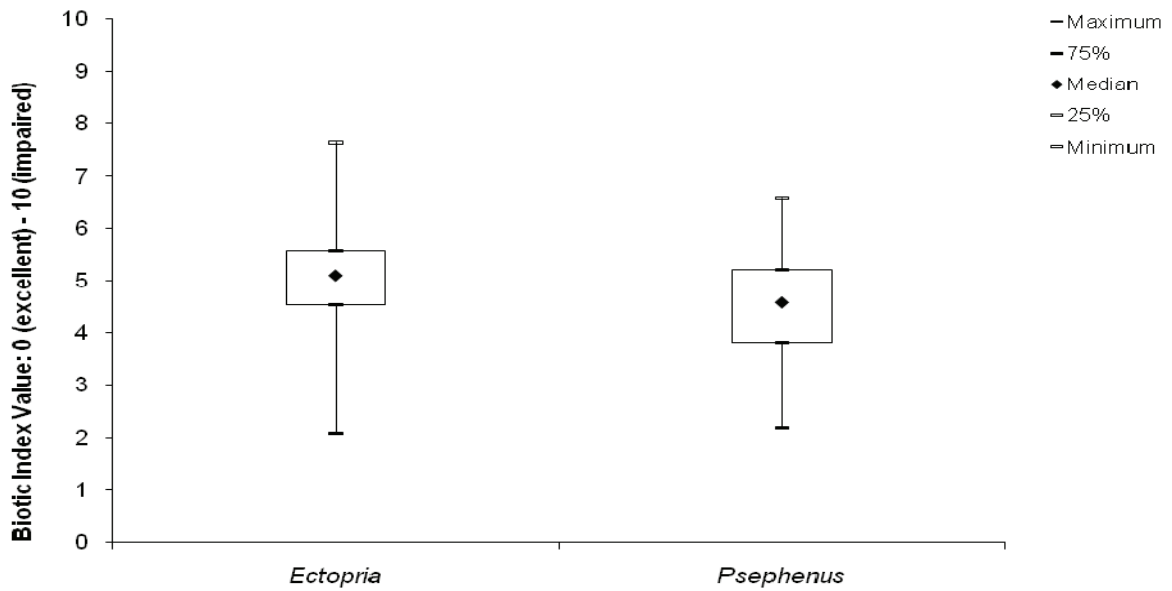
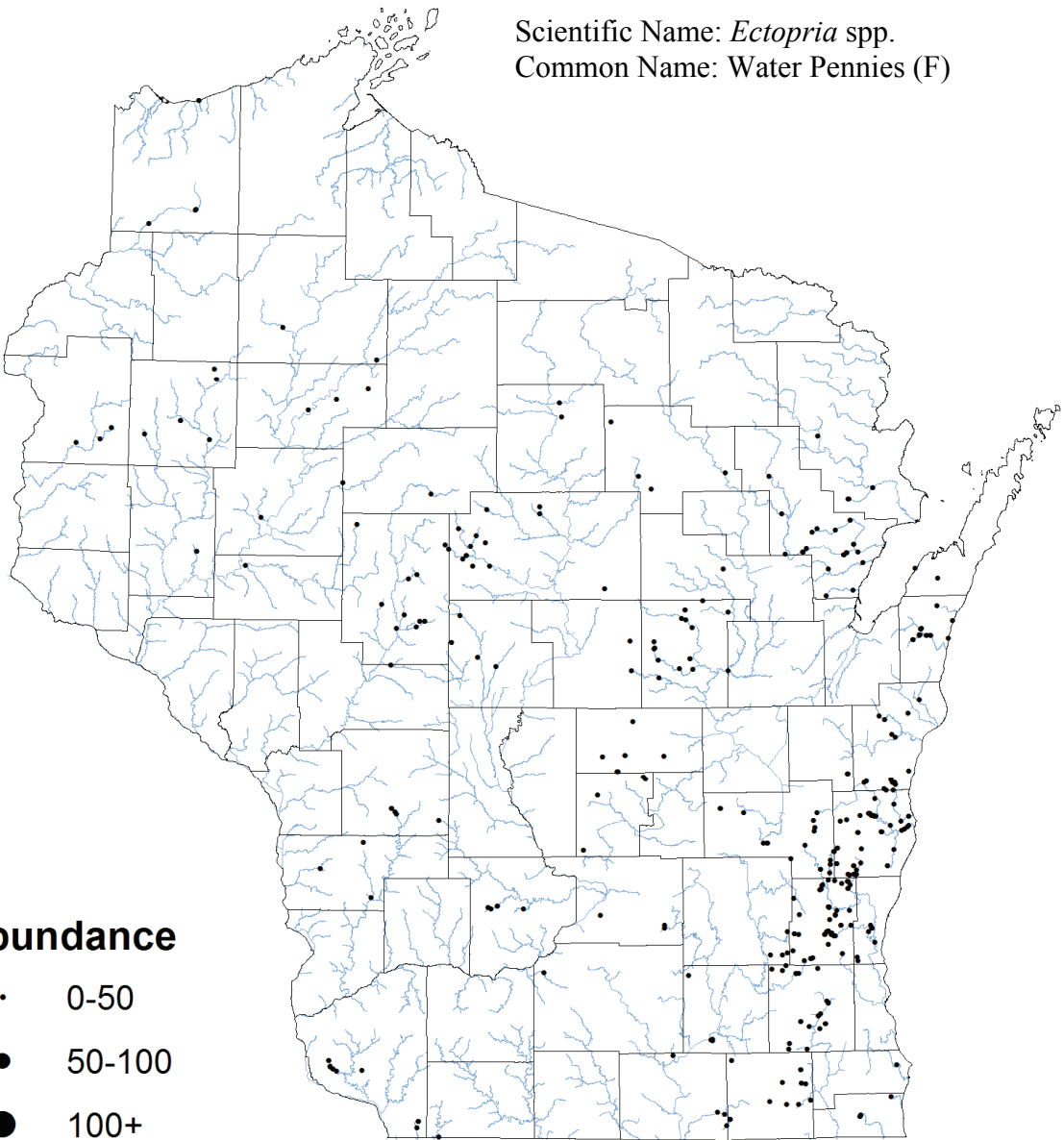


Coleoptera Psephenidae

Scientific Name: *Ectopria* spp.  
Common Name: Water Pennies (F)

Abundance

- 0-50
- 50-100
- 100+

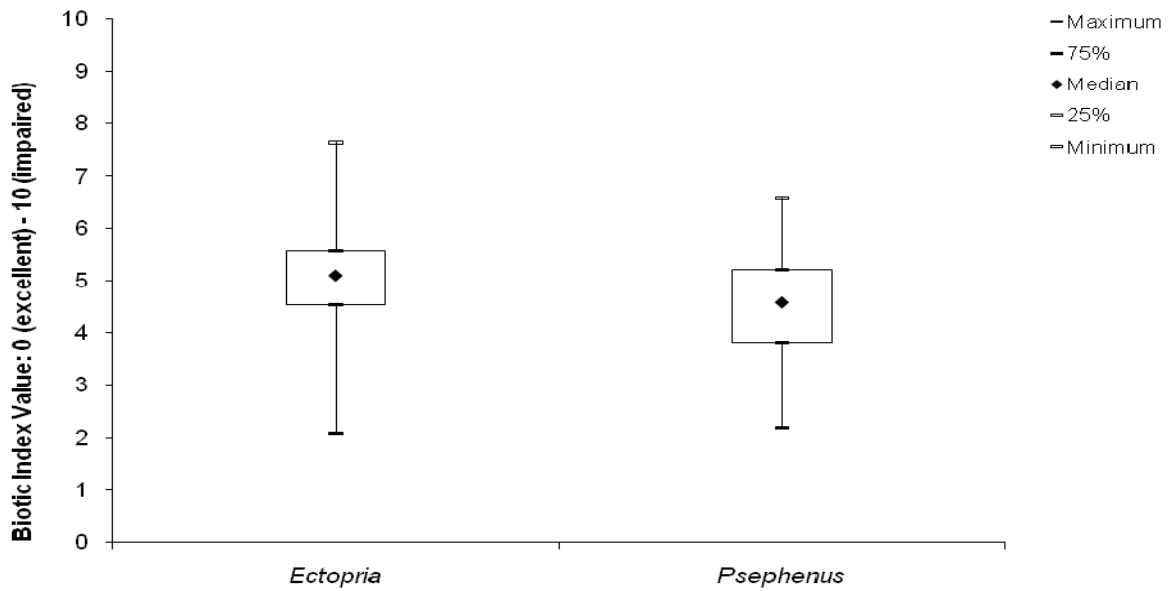
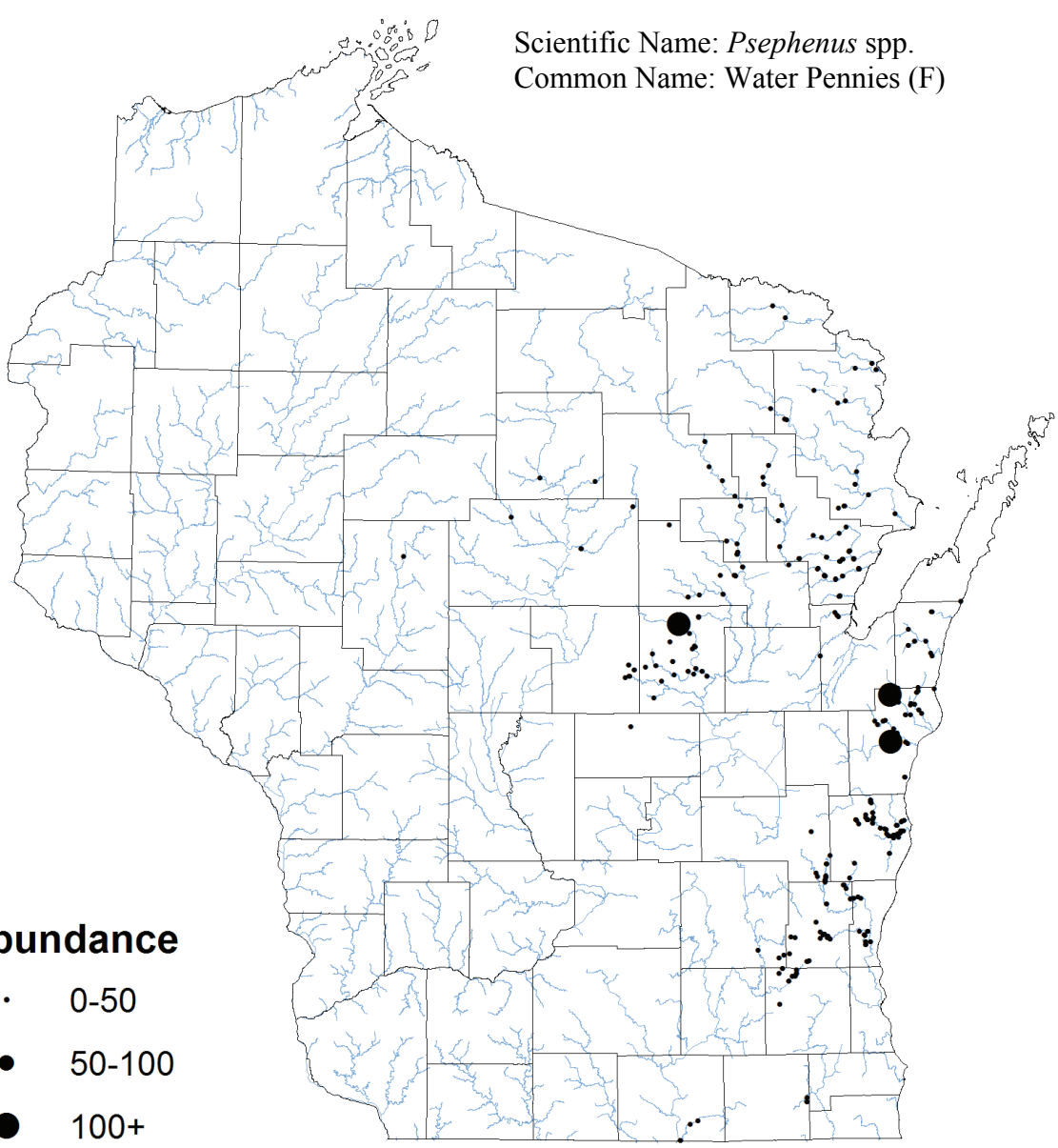


# Coleoptera Psephenidae

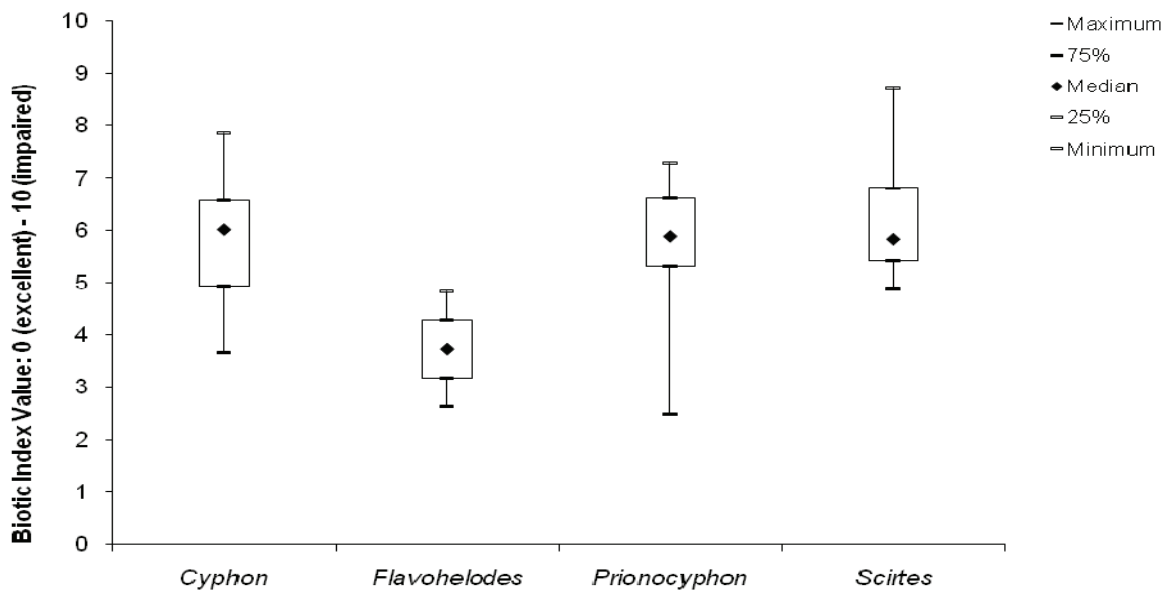
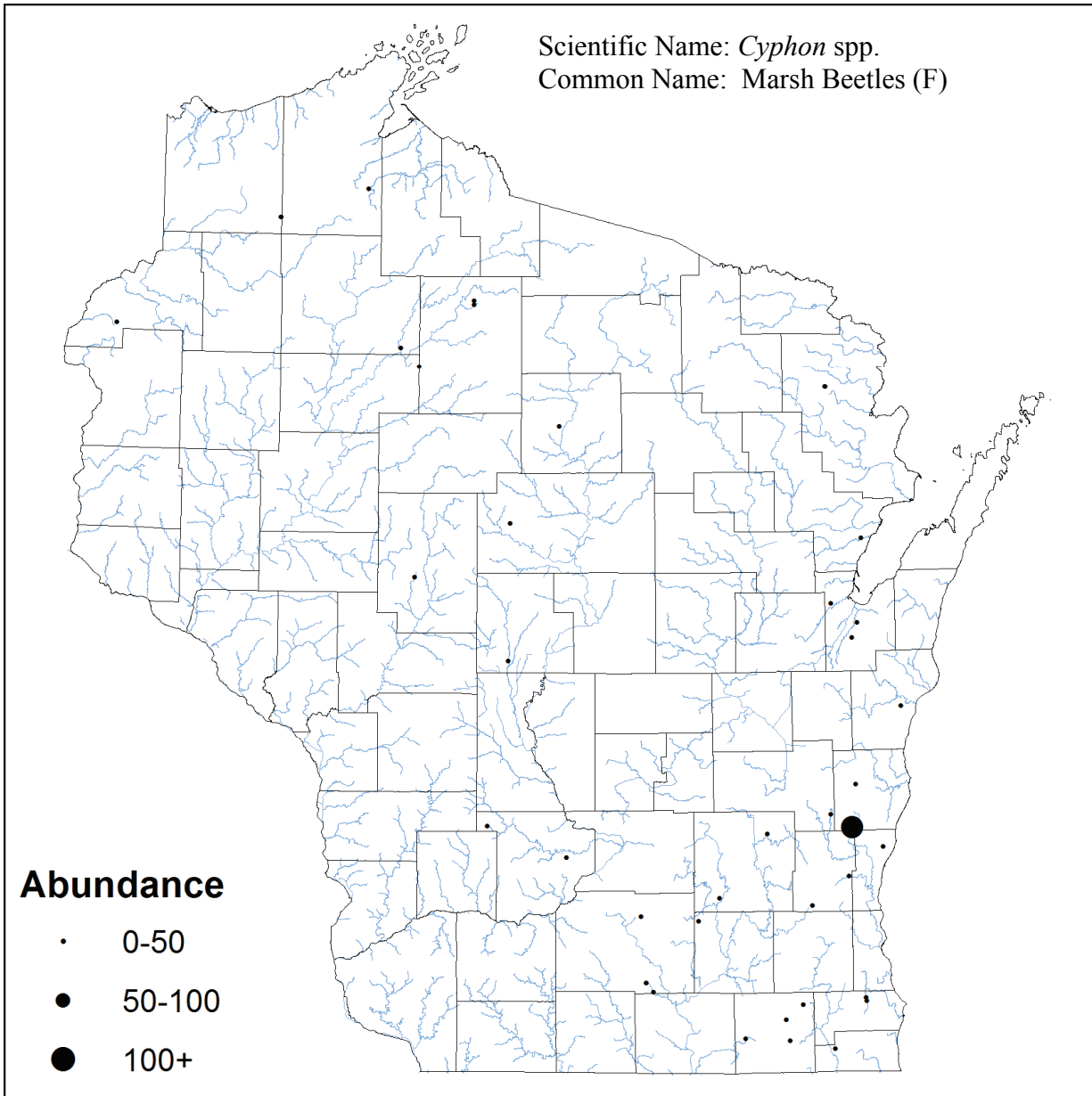
Scientific Name: *Psephenus* spp.  
Common Name: Water Pennies (F)

## Abundance

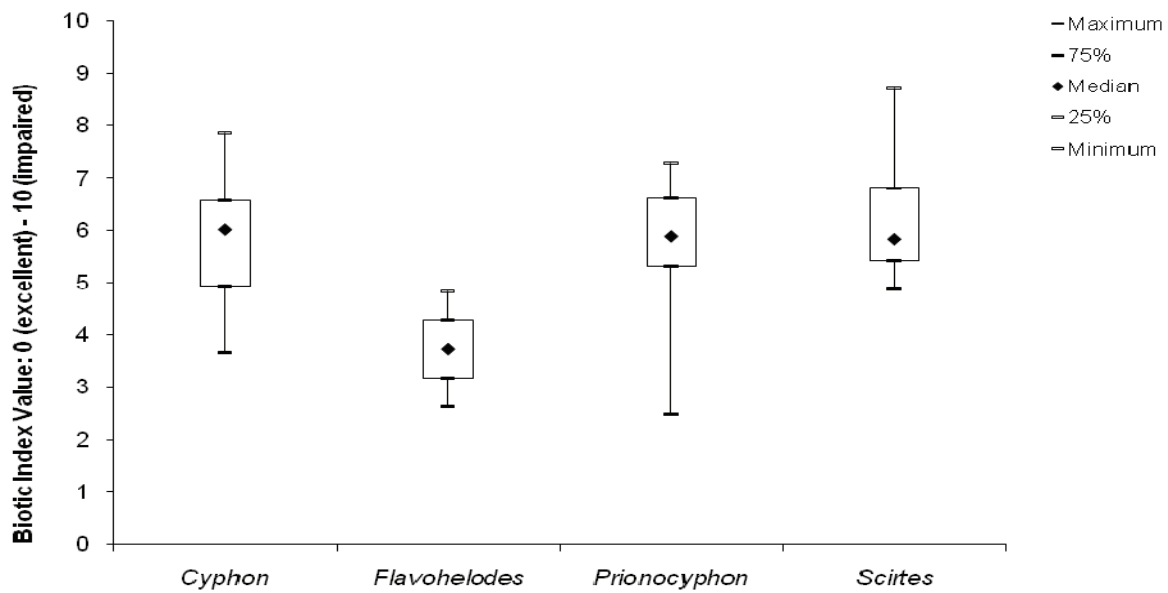
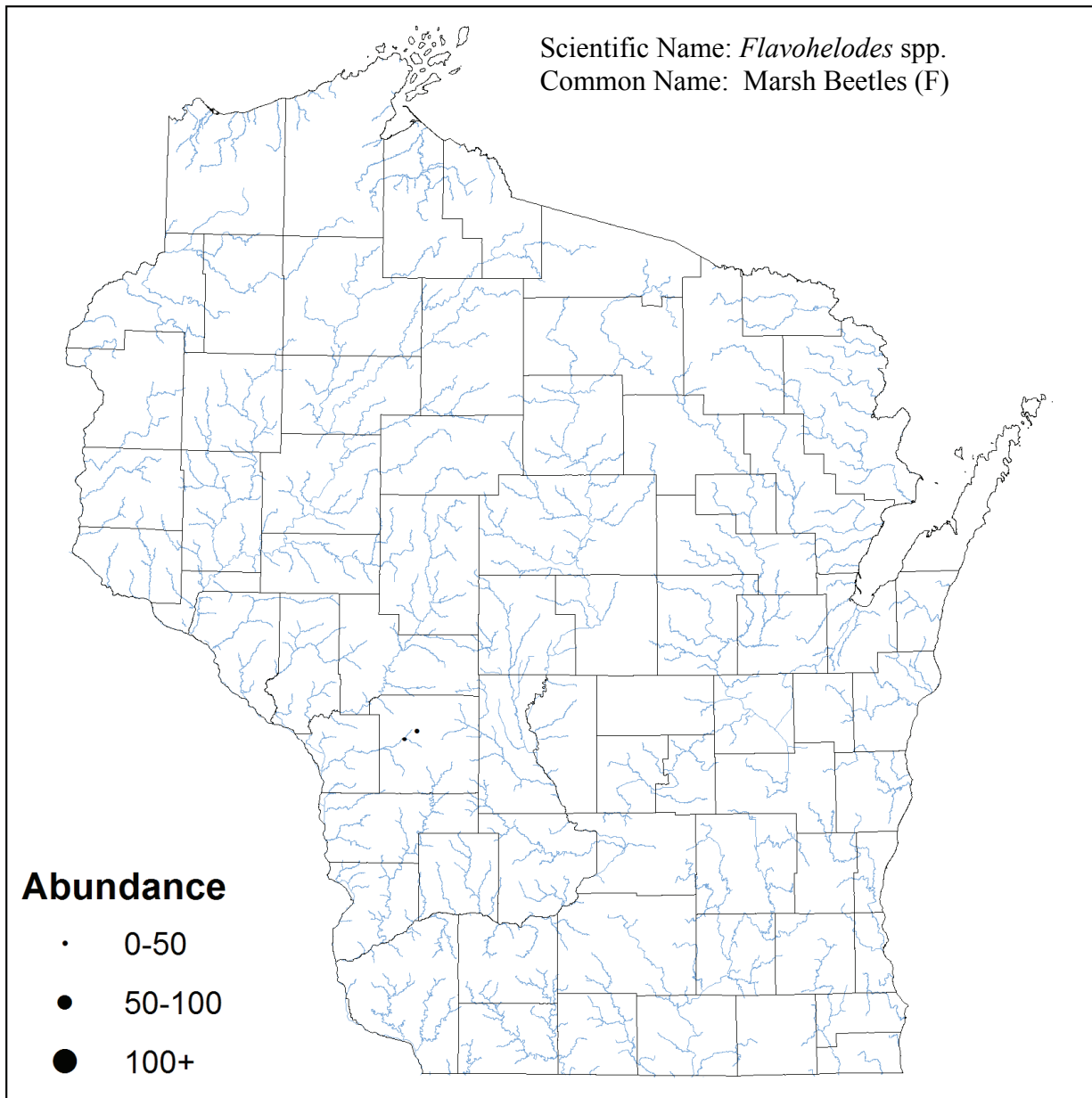
- 0-50
- 50-100
- 100+



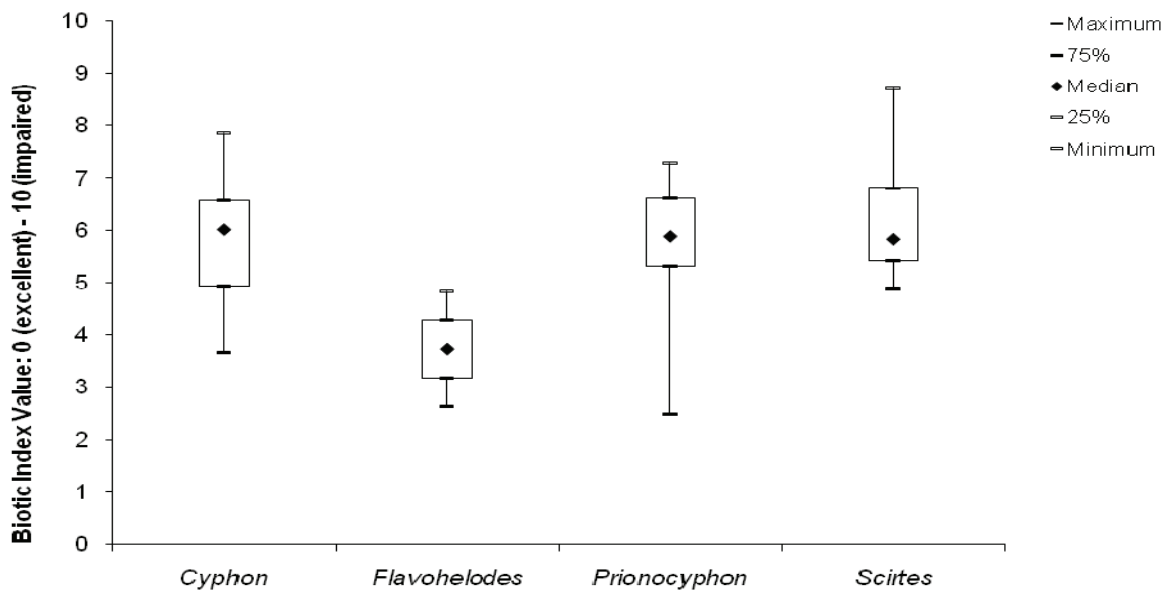
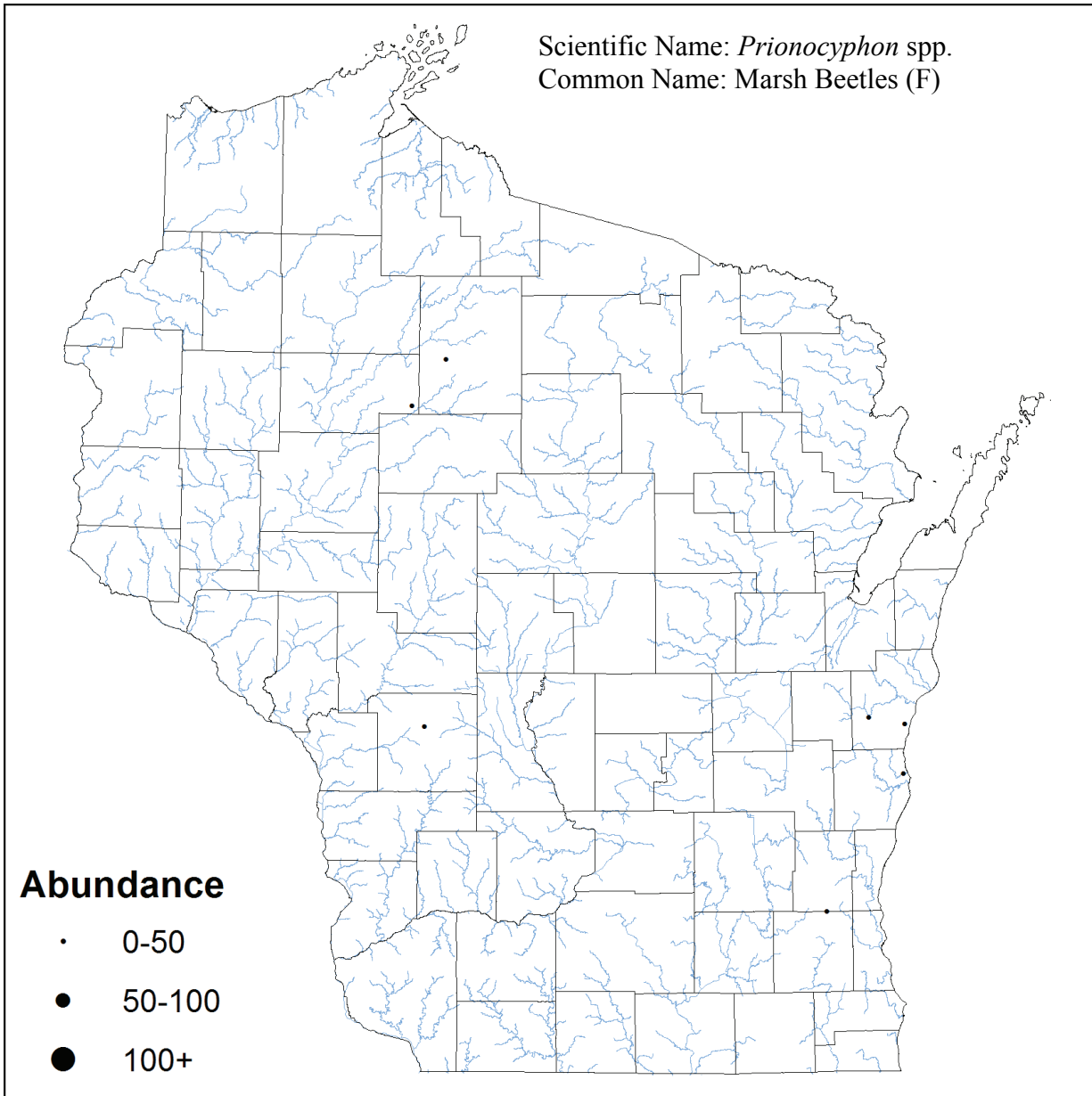
# Coleoptera Scirtidae



# Coleoptera Scirtidae





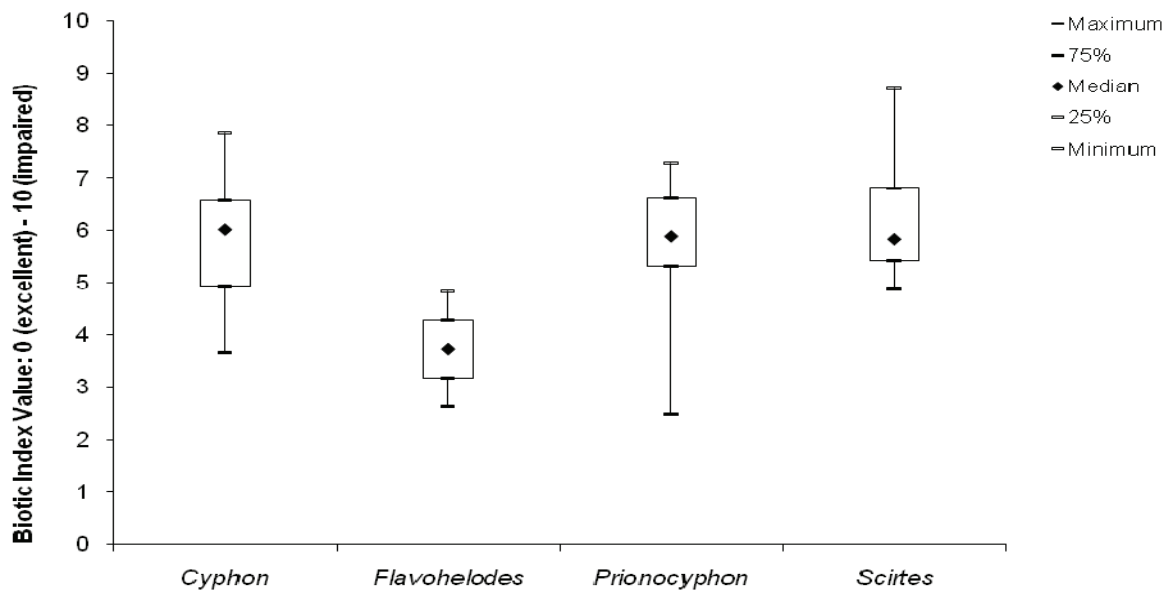
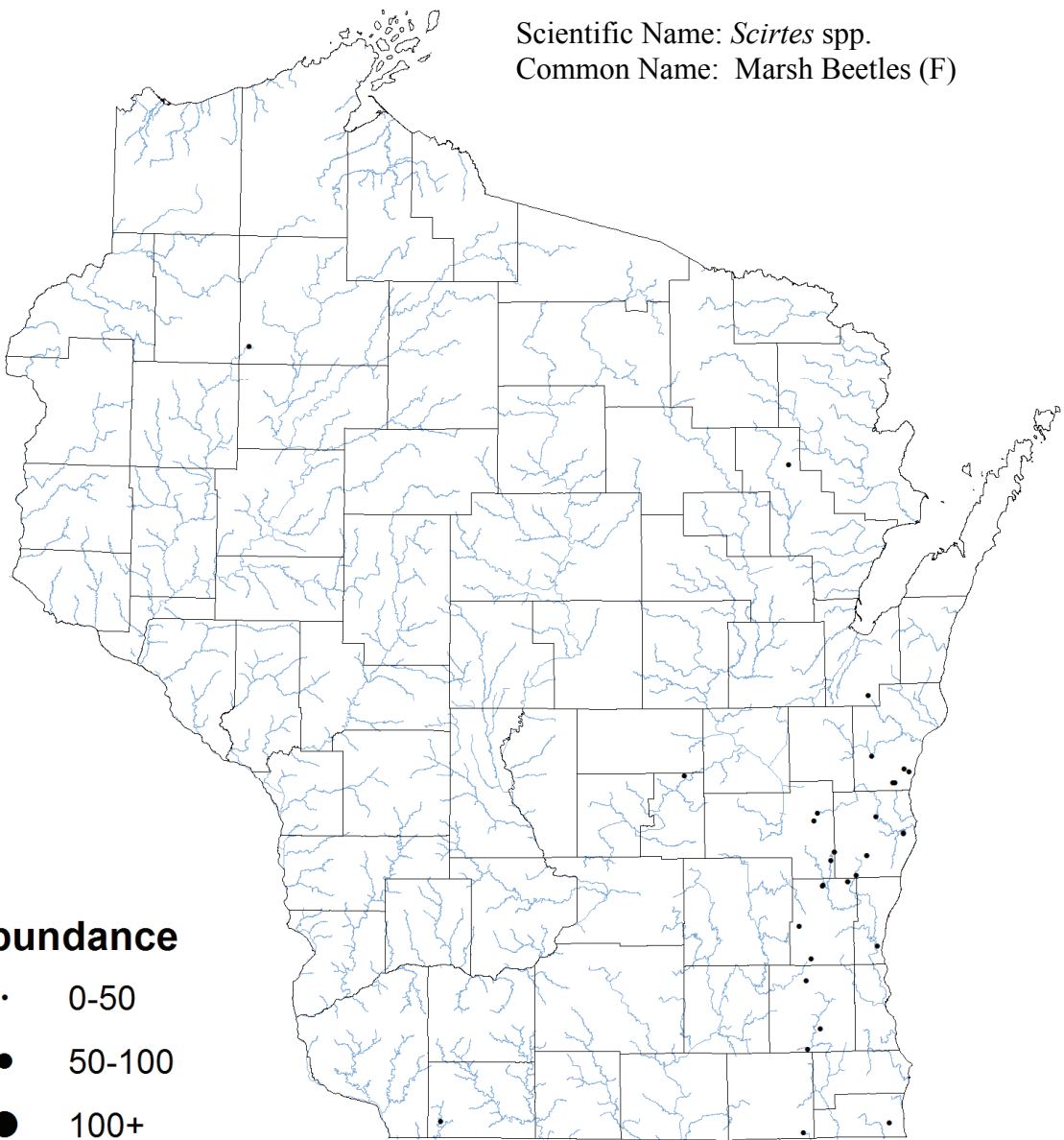


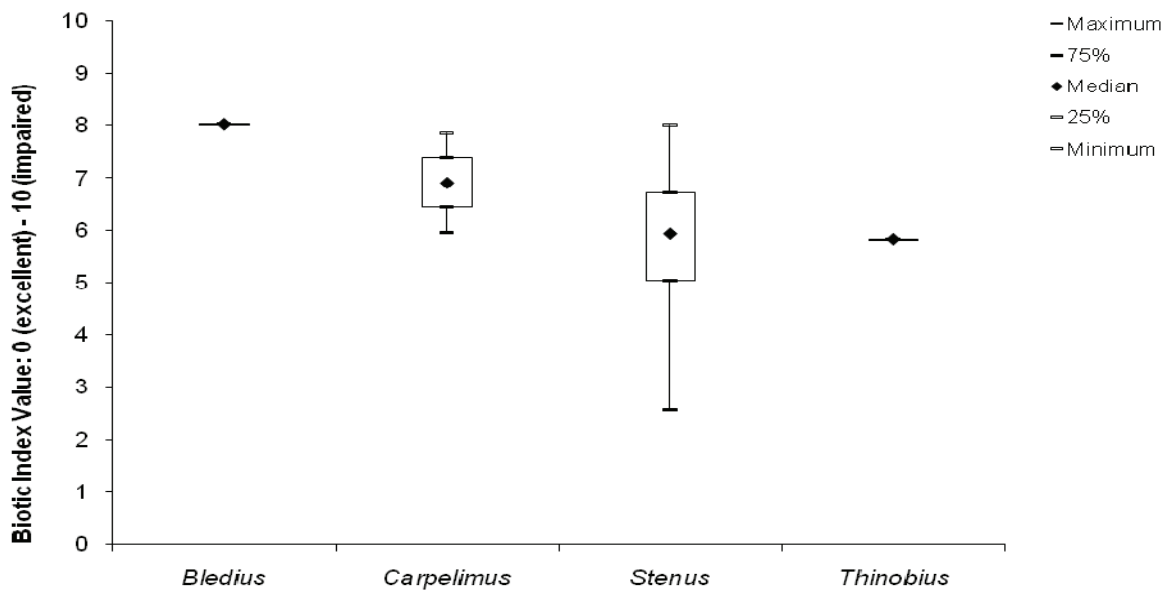
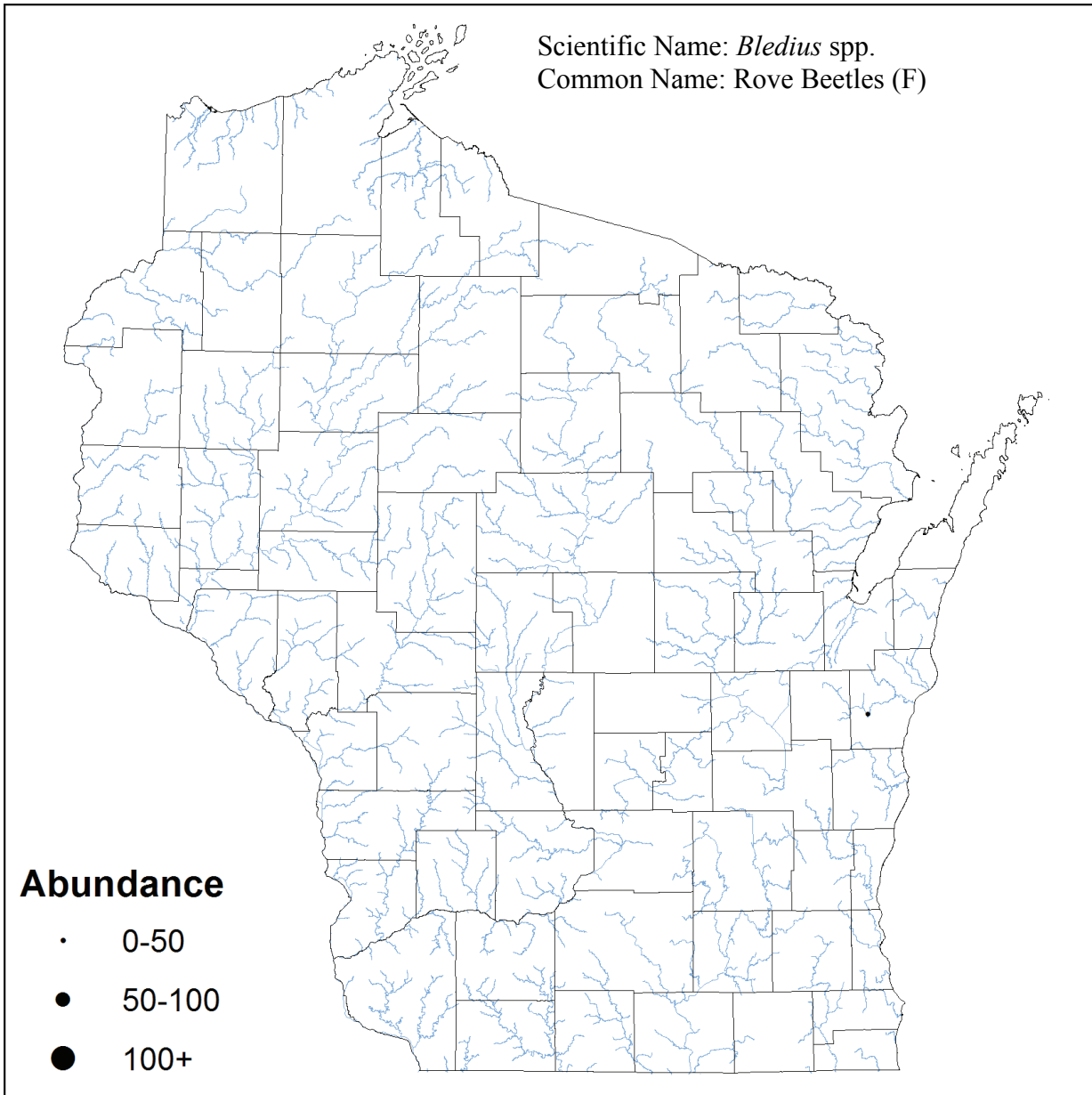
# Coleoptera Scirtidae

Scientific Name: *Scirtes* spp.  
 Common Name: Marsh Beetles (F)

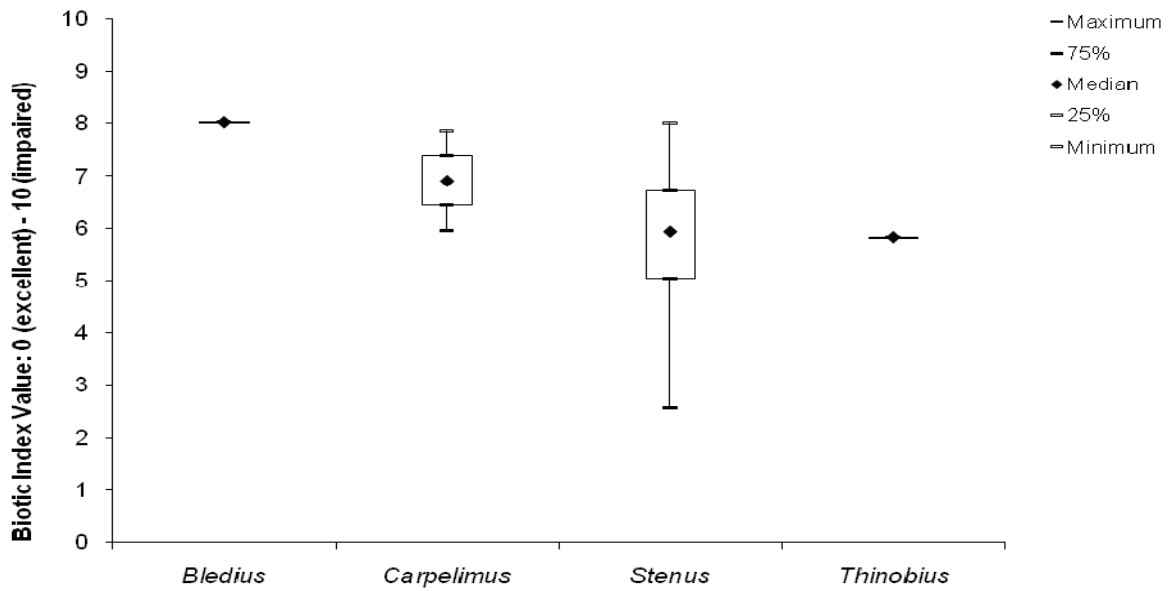
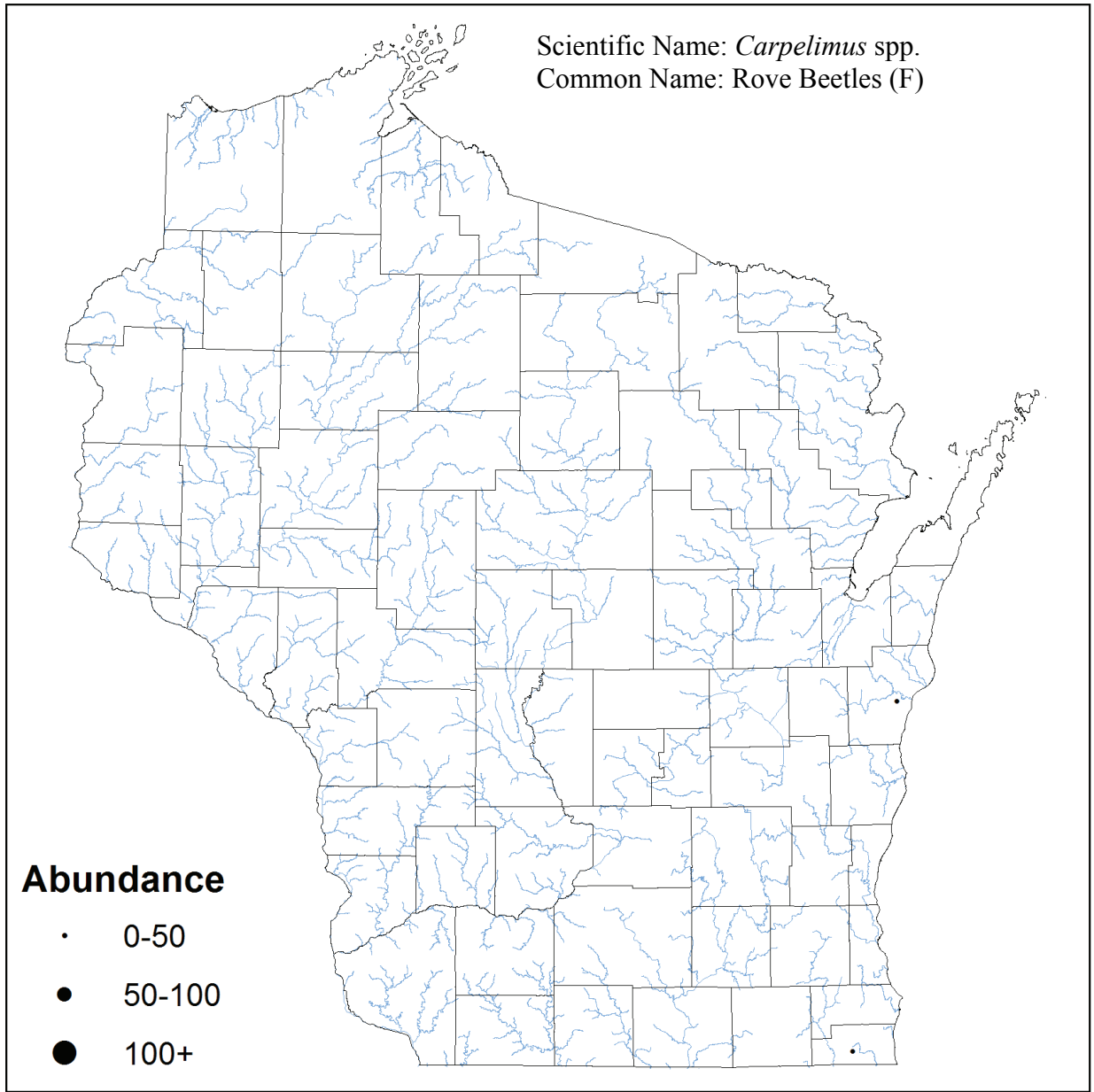
## Abundance

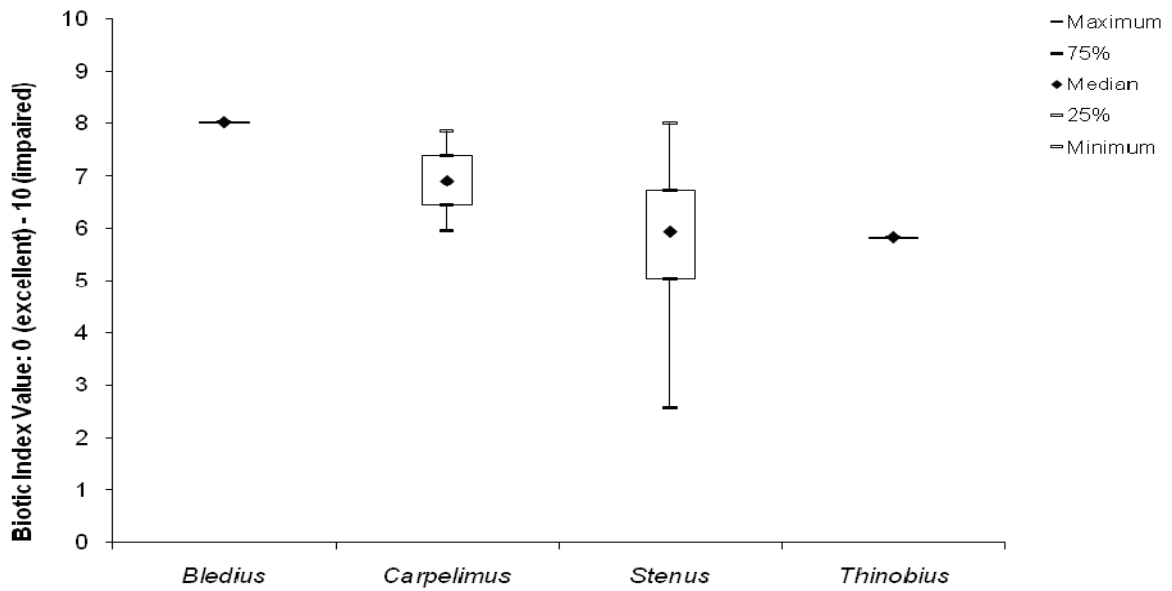
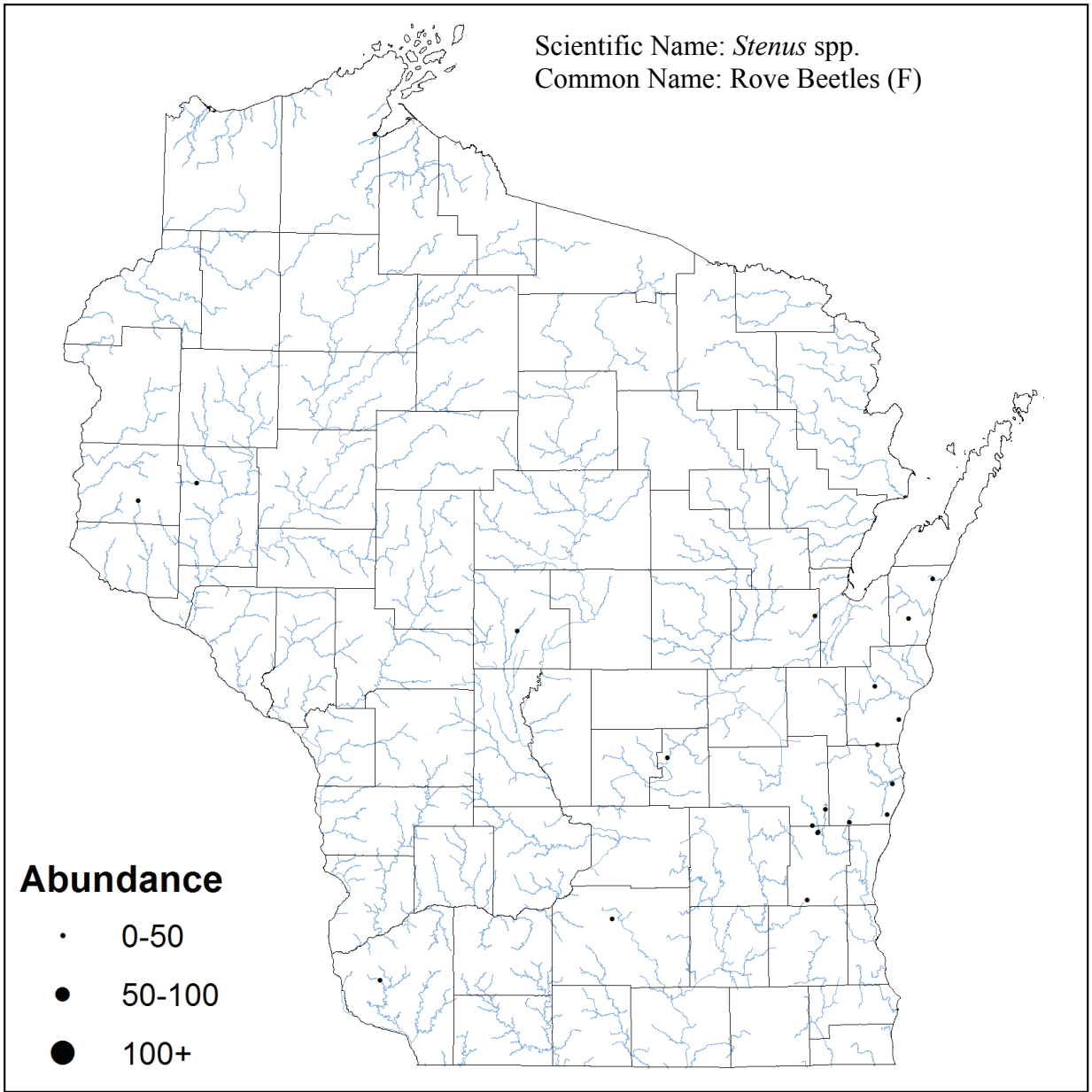
- 0-50
- 50-100
- 100+





# Coleoptera Staphylinidae



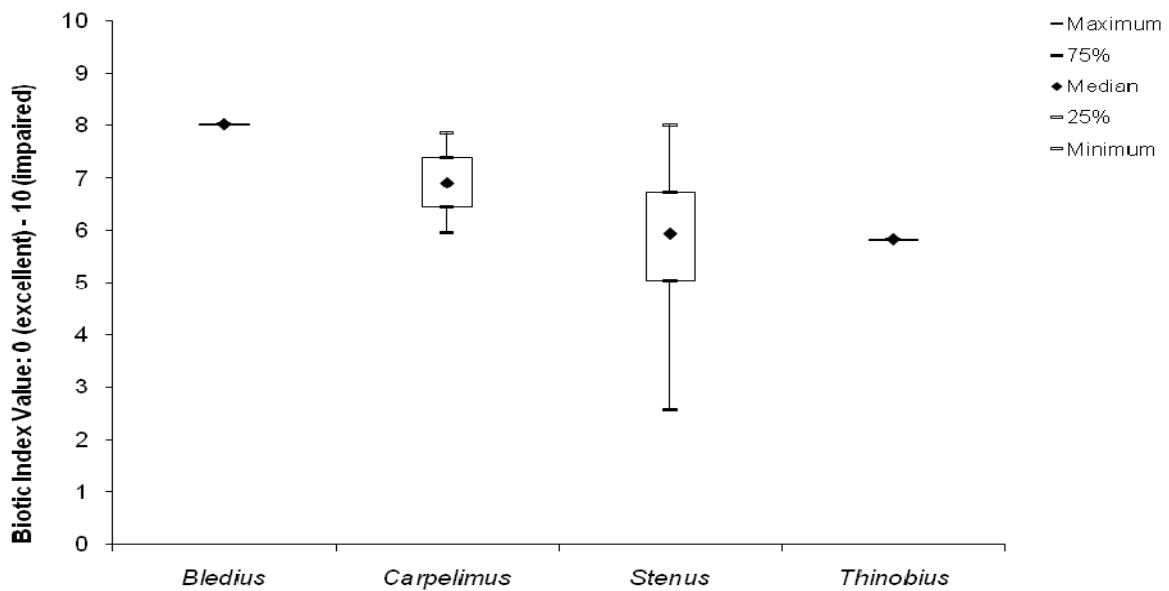
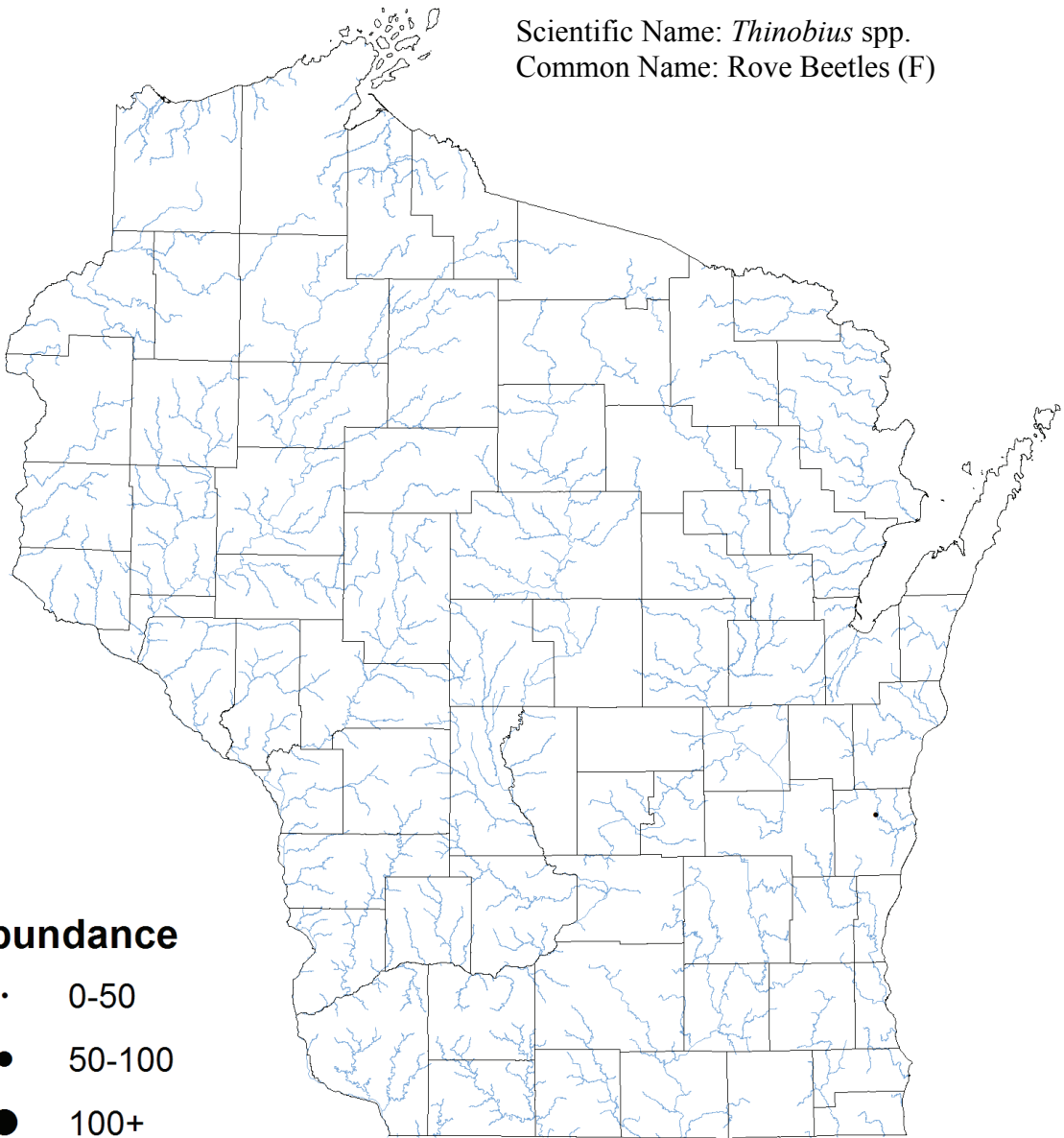


# Coleoptera Staphylinidae

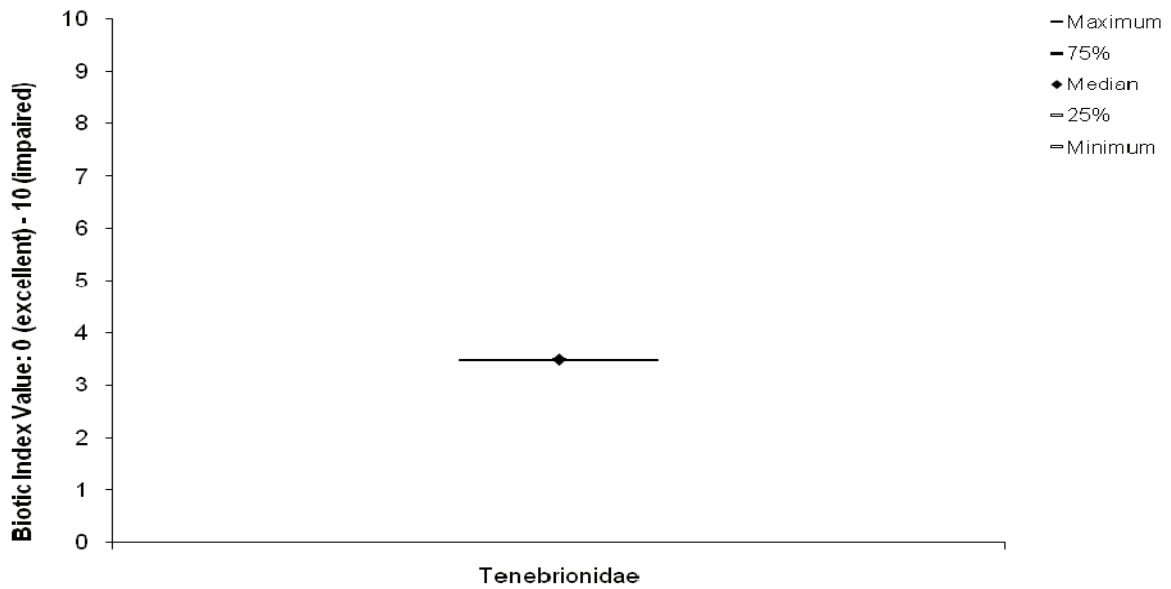
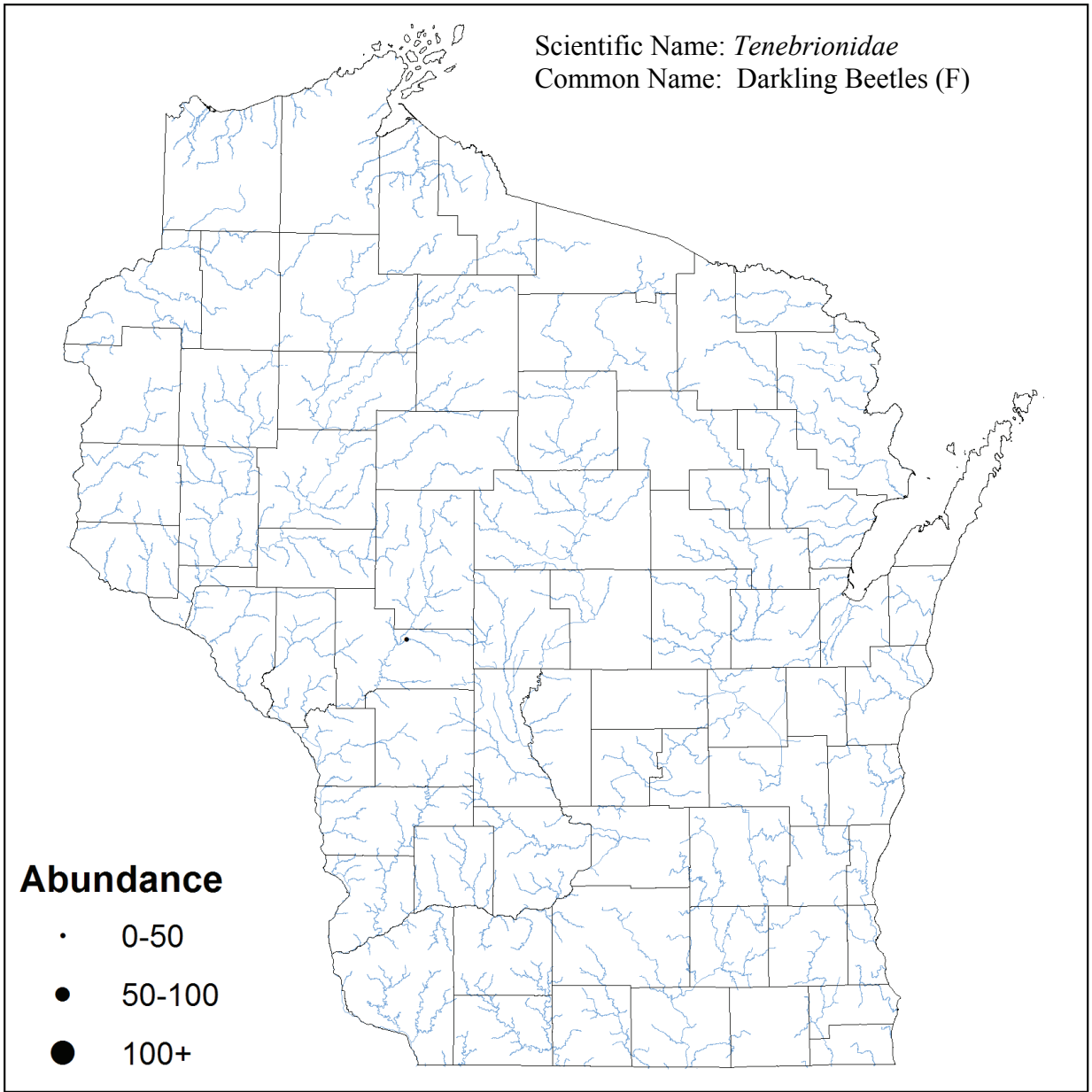
Scientific Name: *Thinobius* spp.  
 Common Name: Rove Beetles (F)

## Abundance

- 0-50
- 50-100
- 100+



# Coleoptera Tenebrionidae







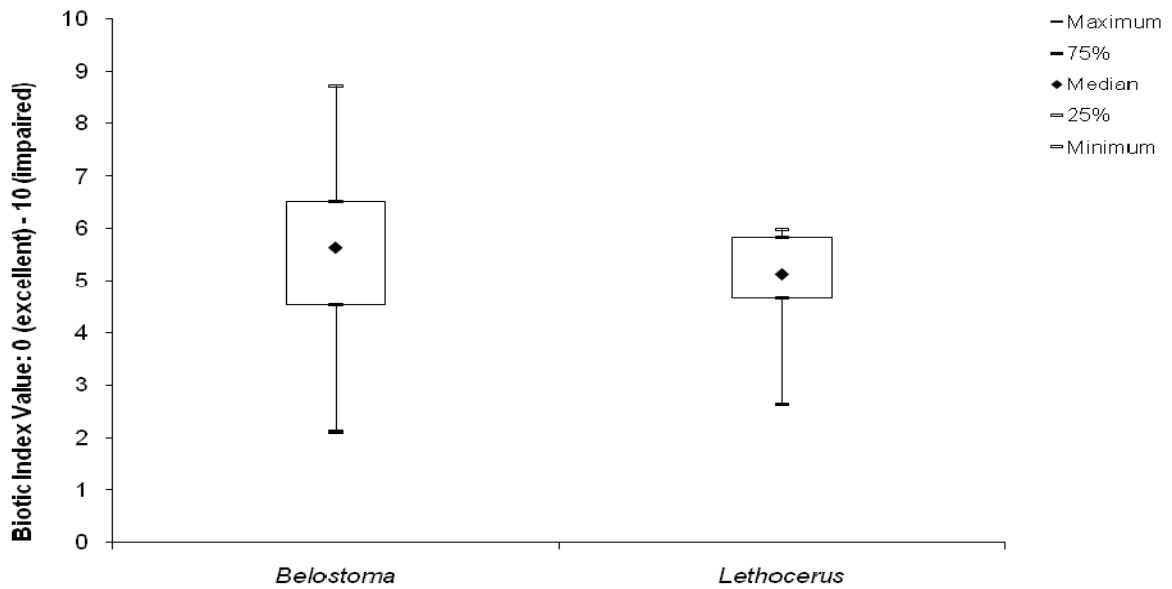
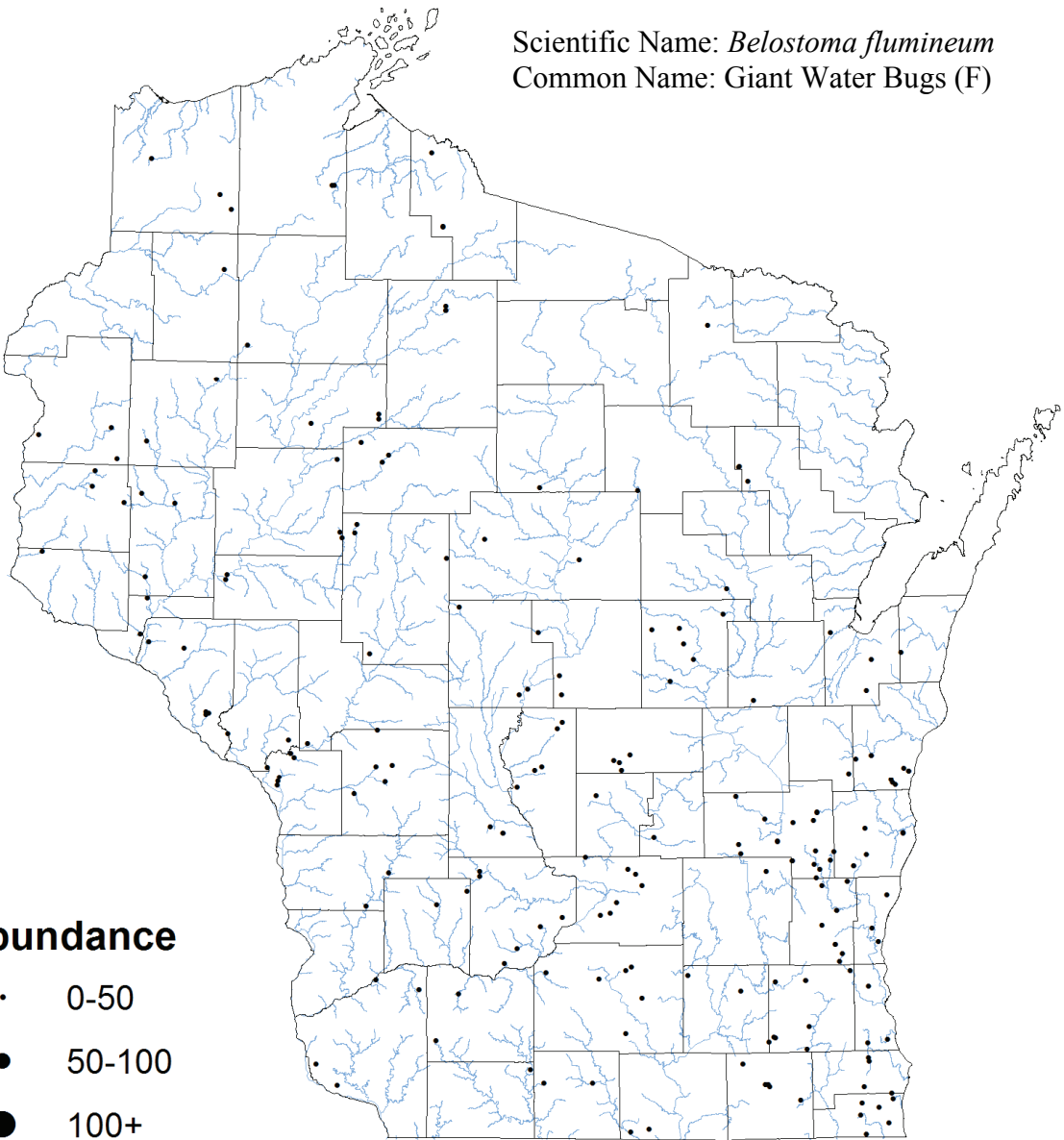
## Section VII: Hemiptera (True Bugs)

# Hemiptera Belostomatidae

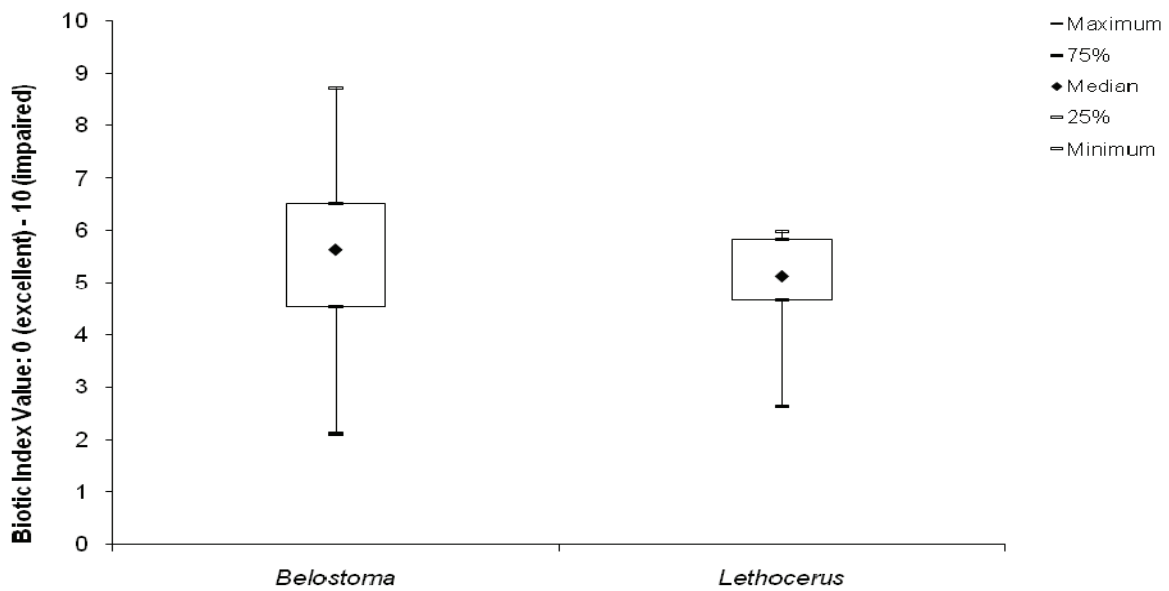
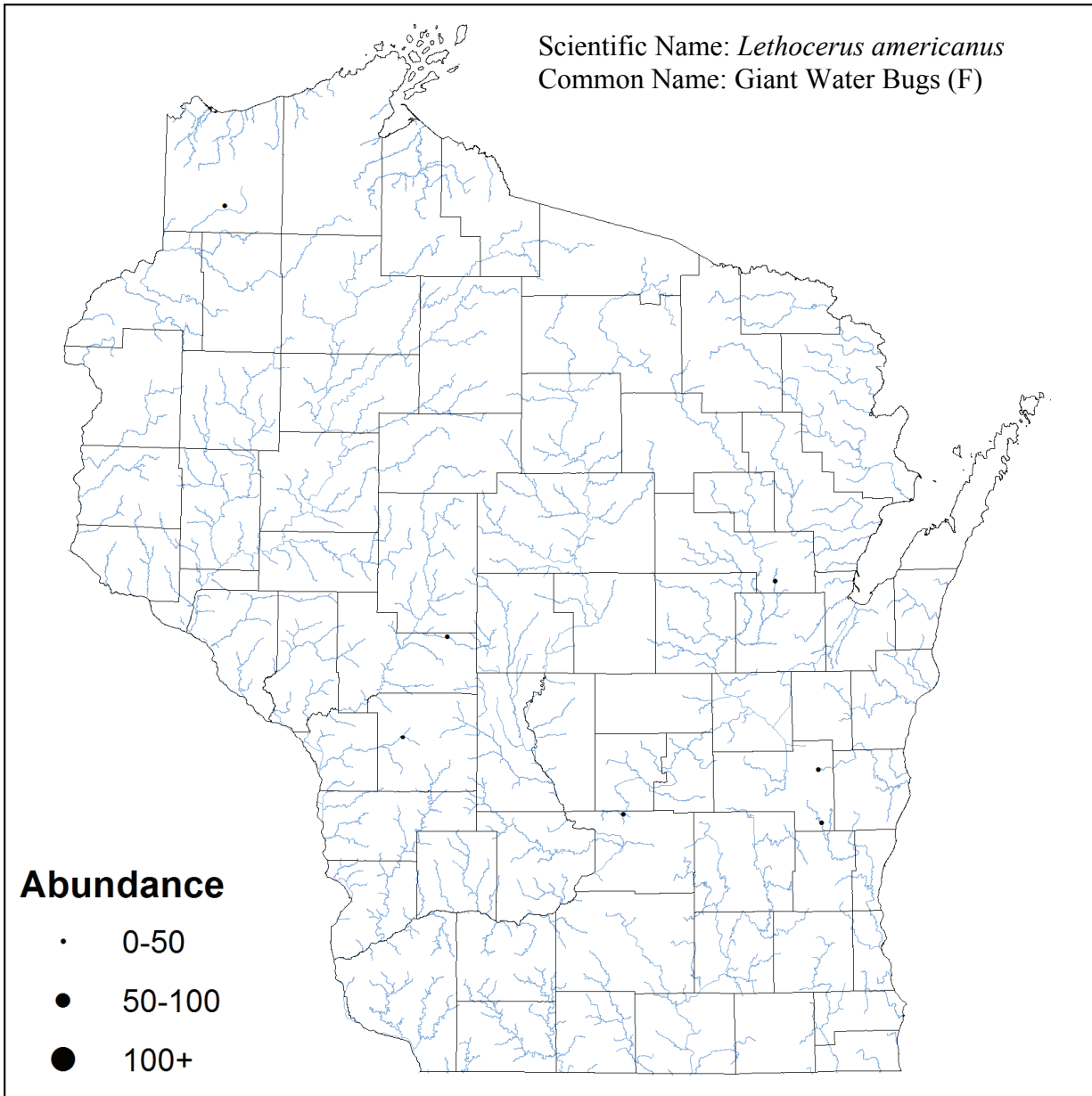
Scientific Name: *Belostoma flumineum*  
 Common Name: Giant Water Bugs (F)

## Abundance

- 0-50
- 50-100
- 100+



# Hemiptera Belostomatidae

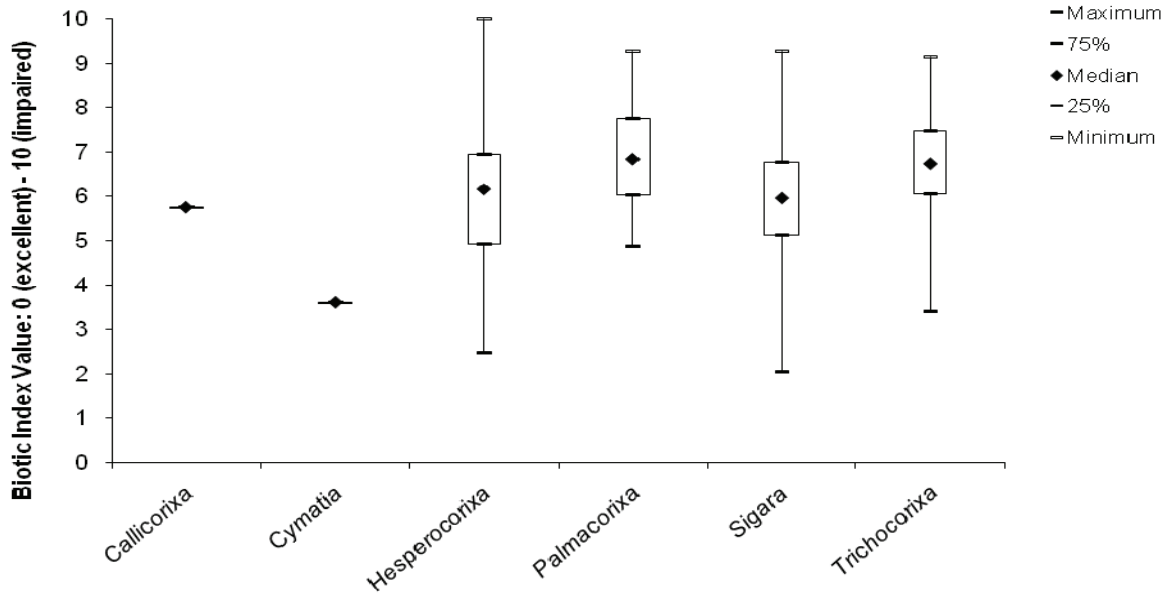
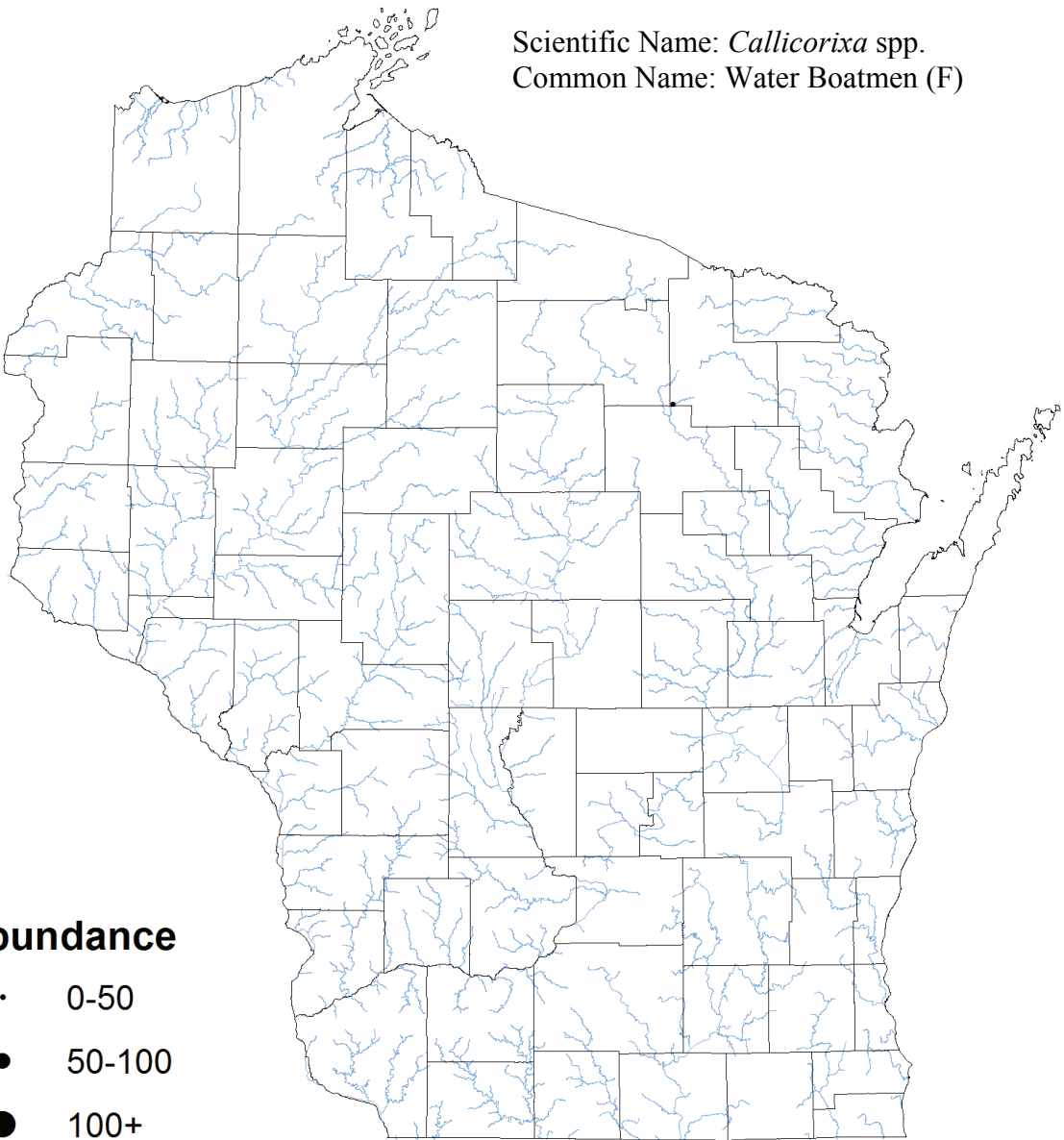


# Hemiptera Corixidae

Scientific Name: *Callicorixa* spp.  
 Common Name: Water Boatmen (F)

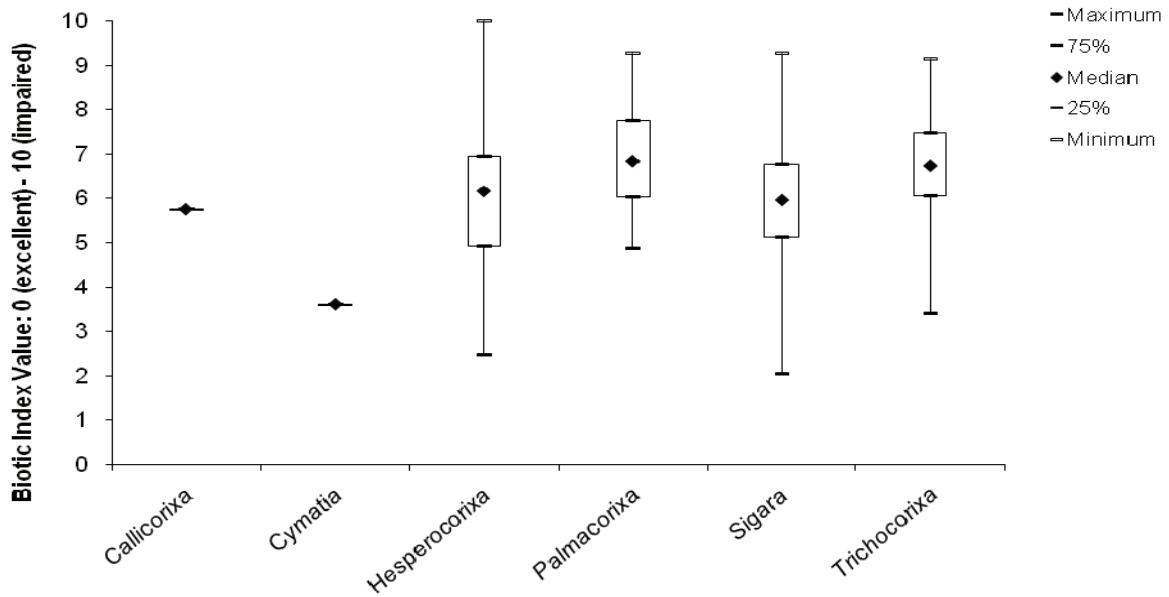
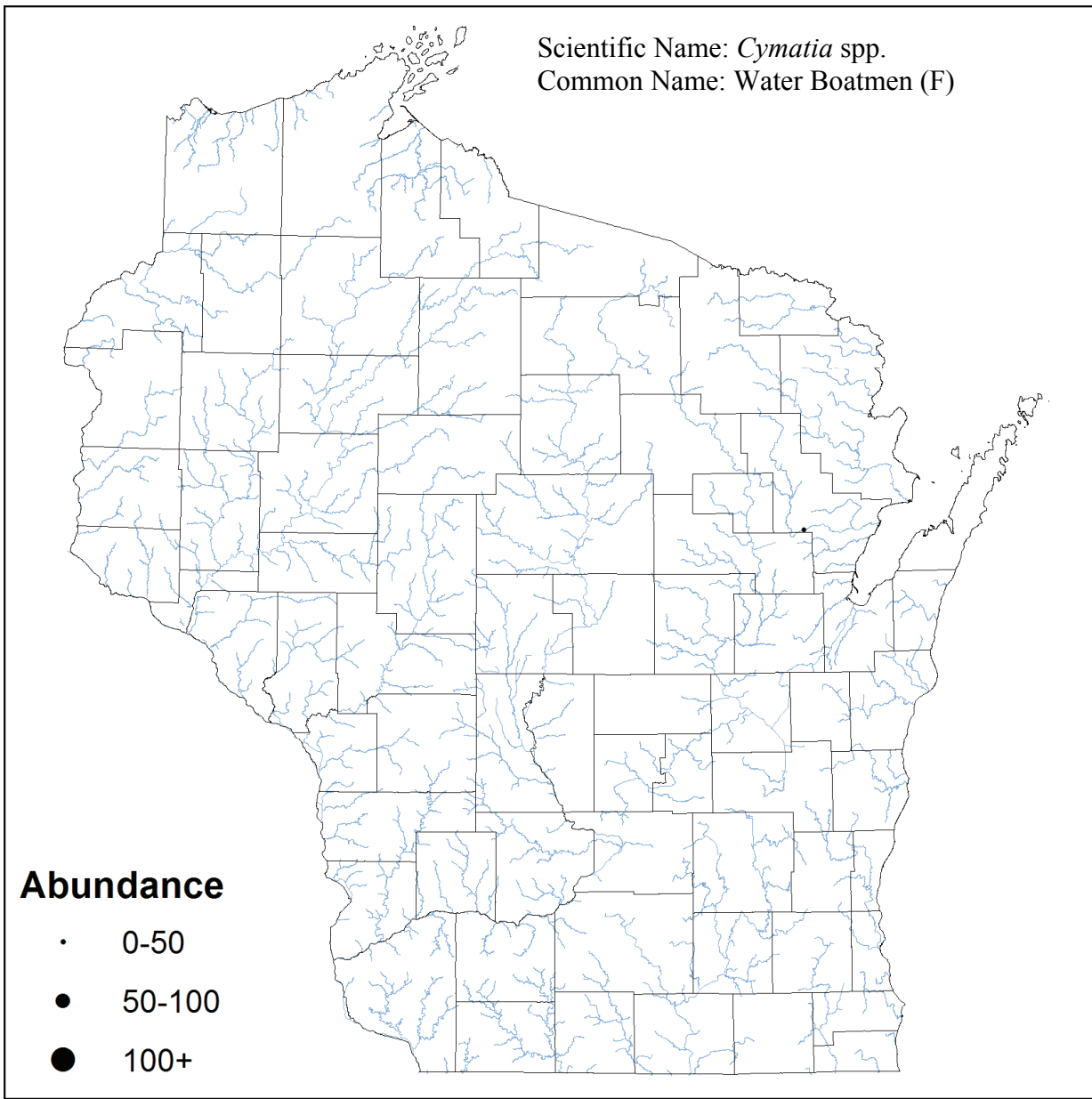
## Abundance

- 0-50
- 50-100
- 100+



# Hemiptera Corixidae

Scientific Name: *Cymatia* spp.  
 Common Name: Water Boatmen (F)

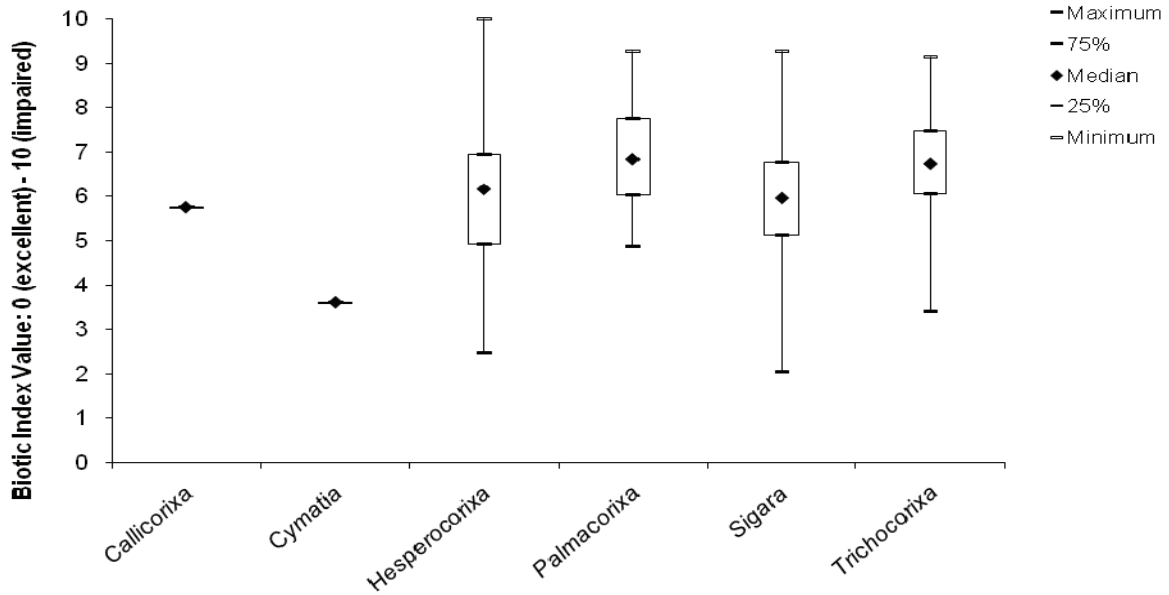
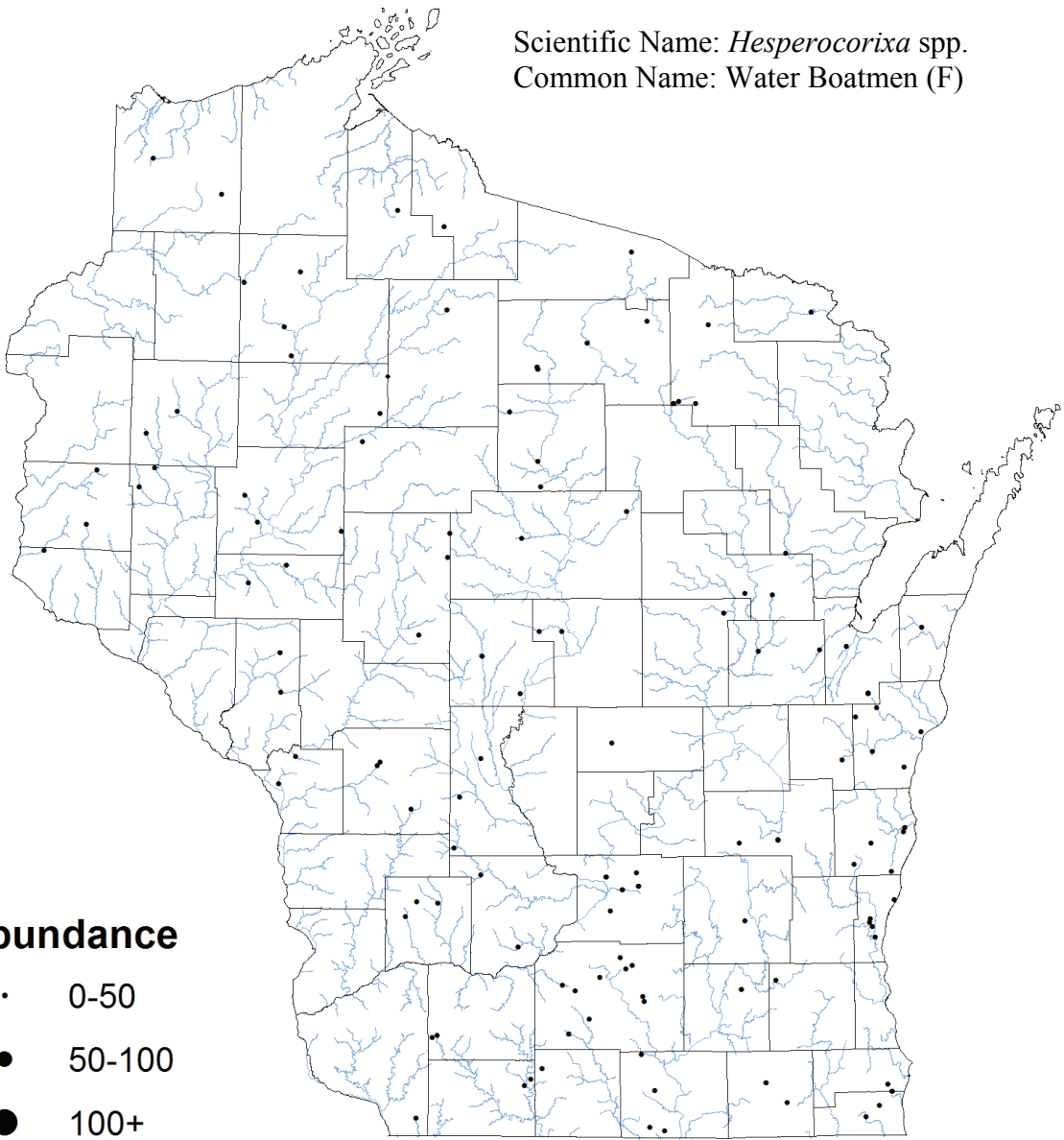


# Hemiptera Corixidae

Scientific Name: *Hesperocorixa* spp.  
 Common Name: Water Boatmen (F)

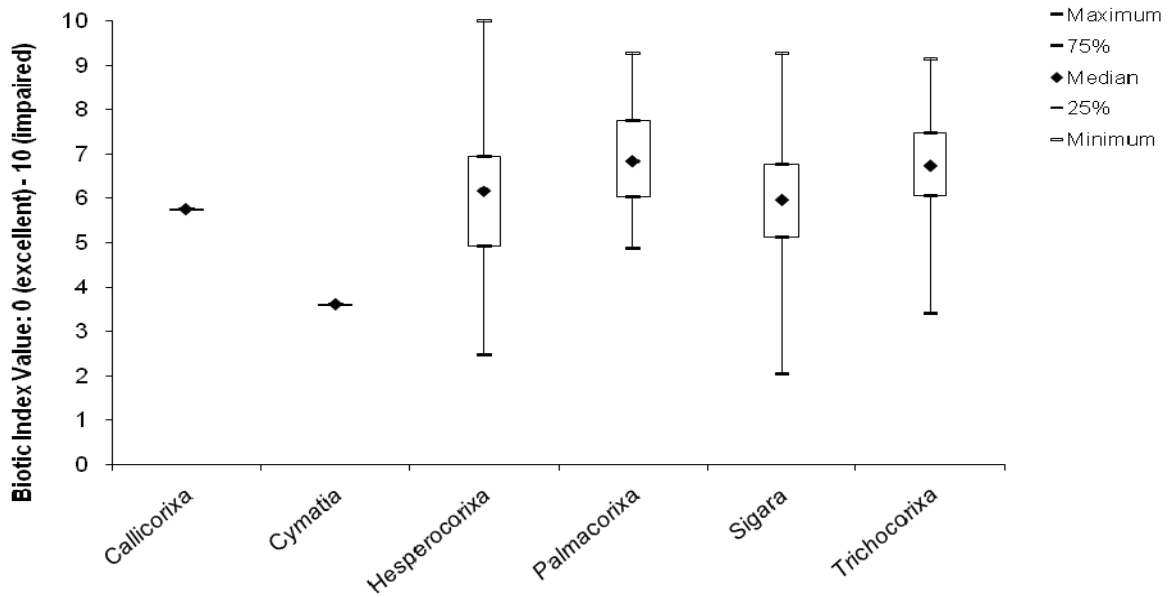
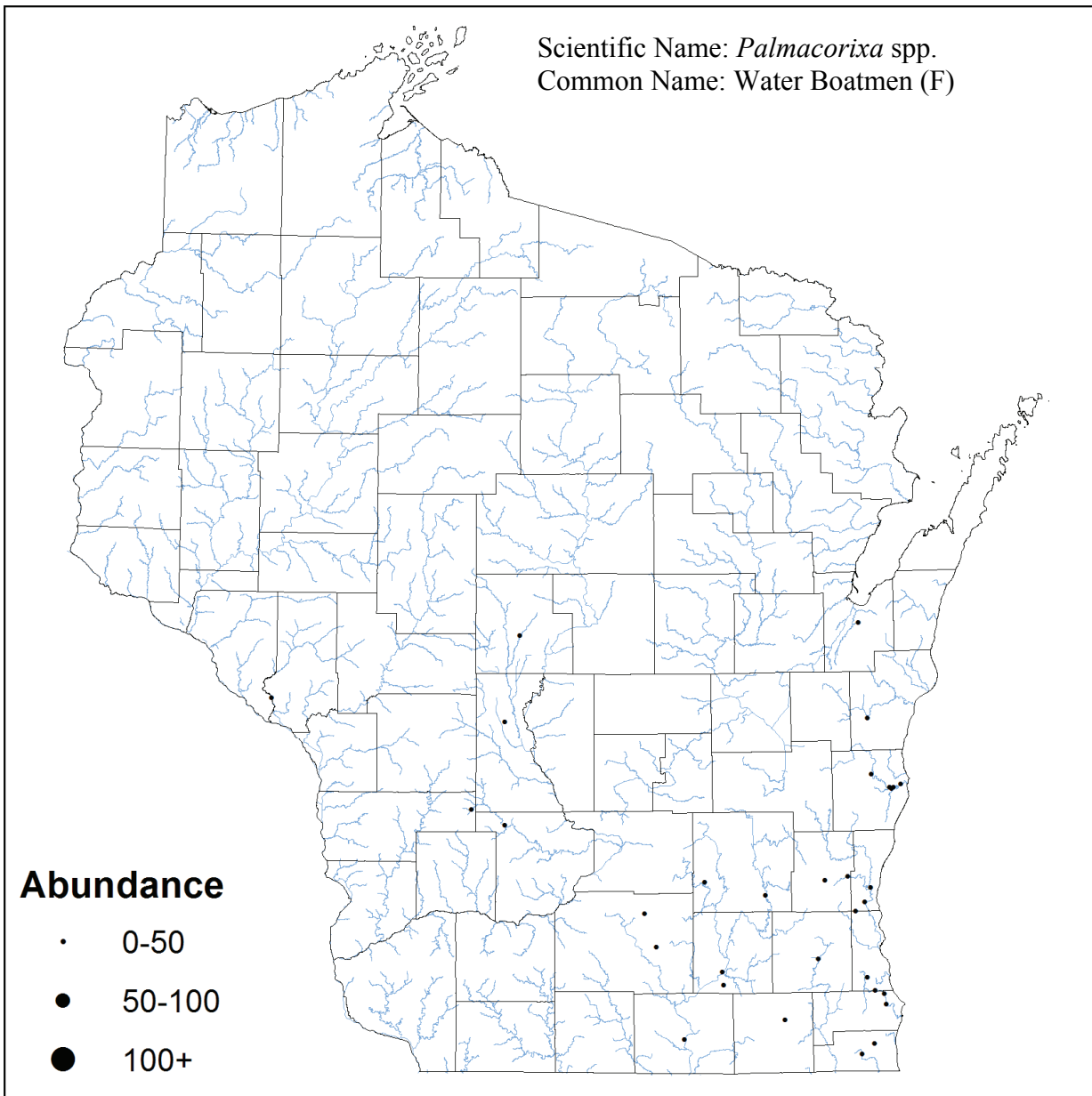
## Abundance

- 0-50
- 50-100
- 100+



# Hemiptera Corixidae

Scientific Name: *Palmarcorixa* spp.  
 Common Name: Water Boatmen (F)

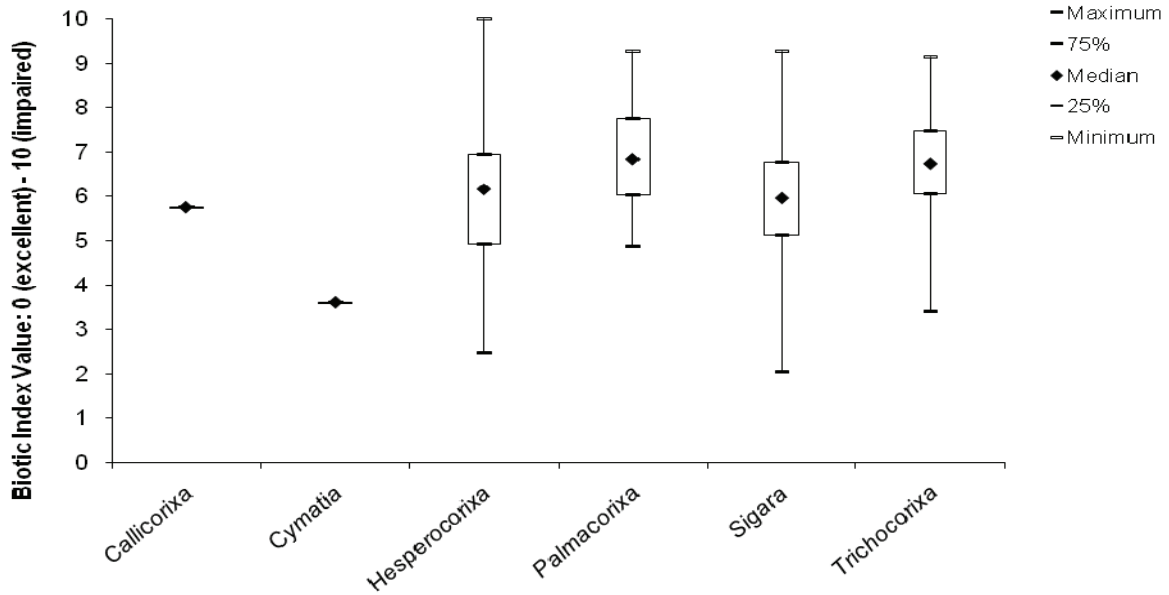
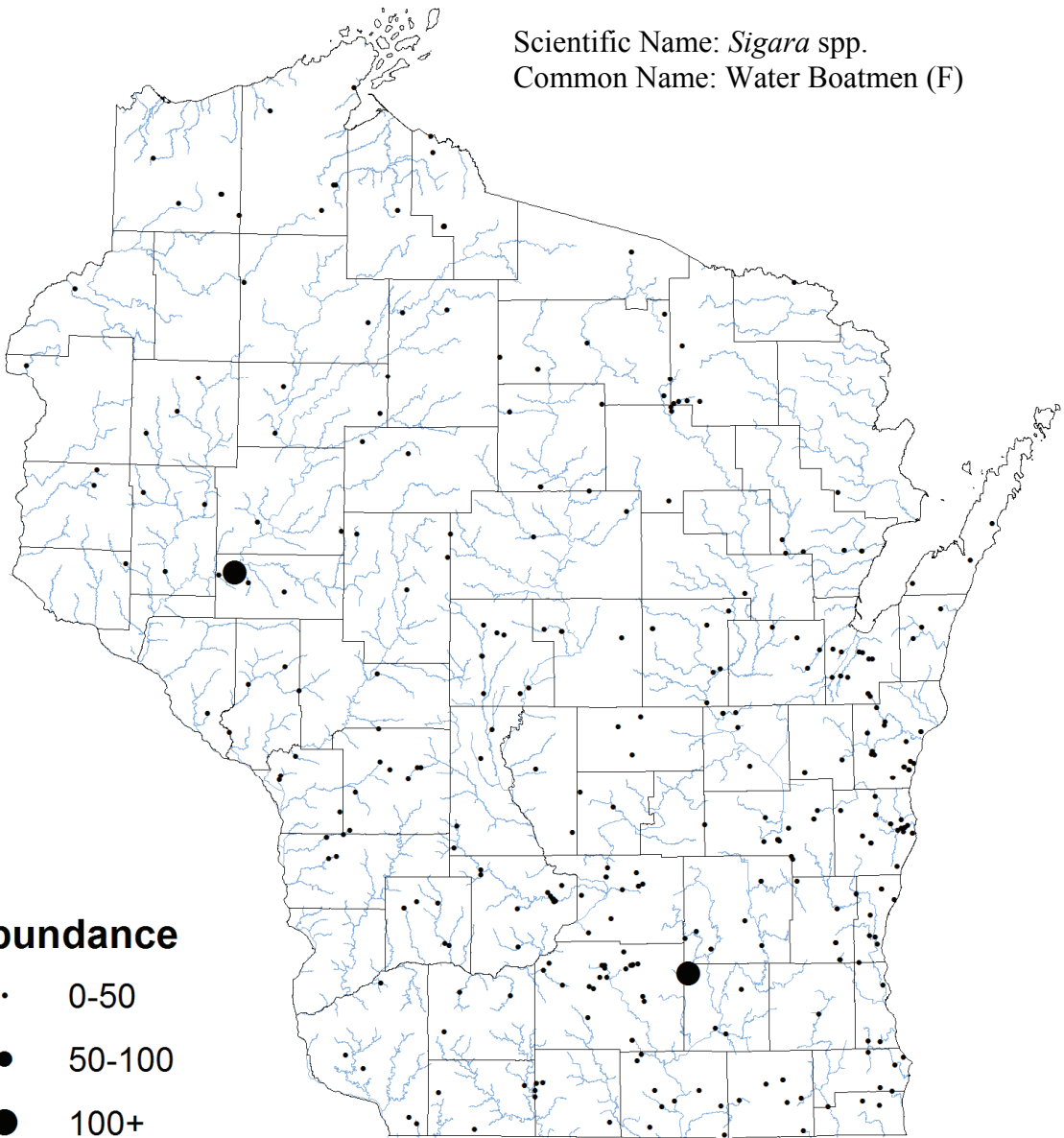


# Hemiptera Corixidae

Scientific Name: *Sigara* spp.  
 Common Name: Water Boatmen (F)

## Abundance

- 0-50
- 50-100
- 100+



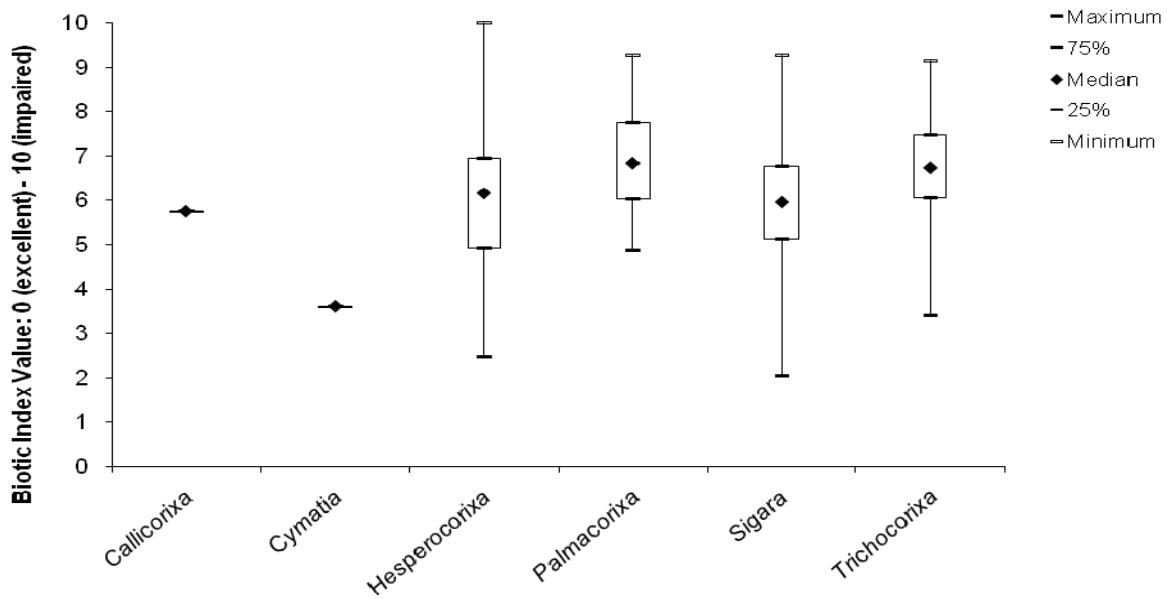
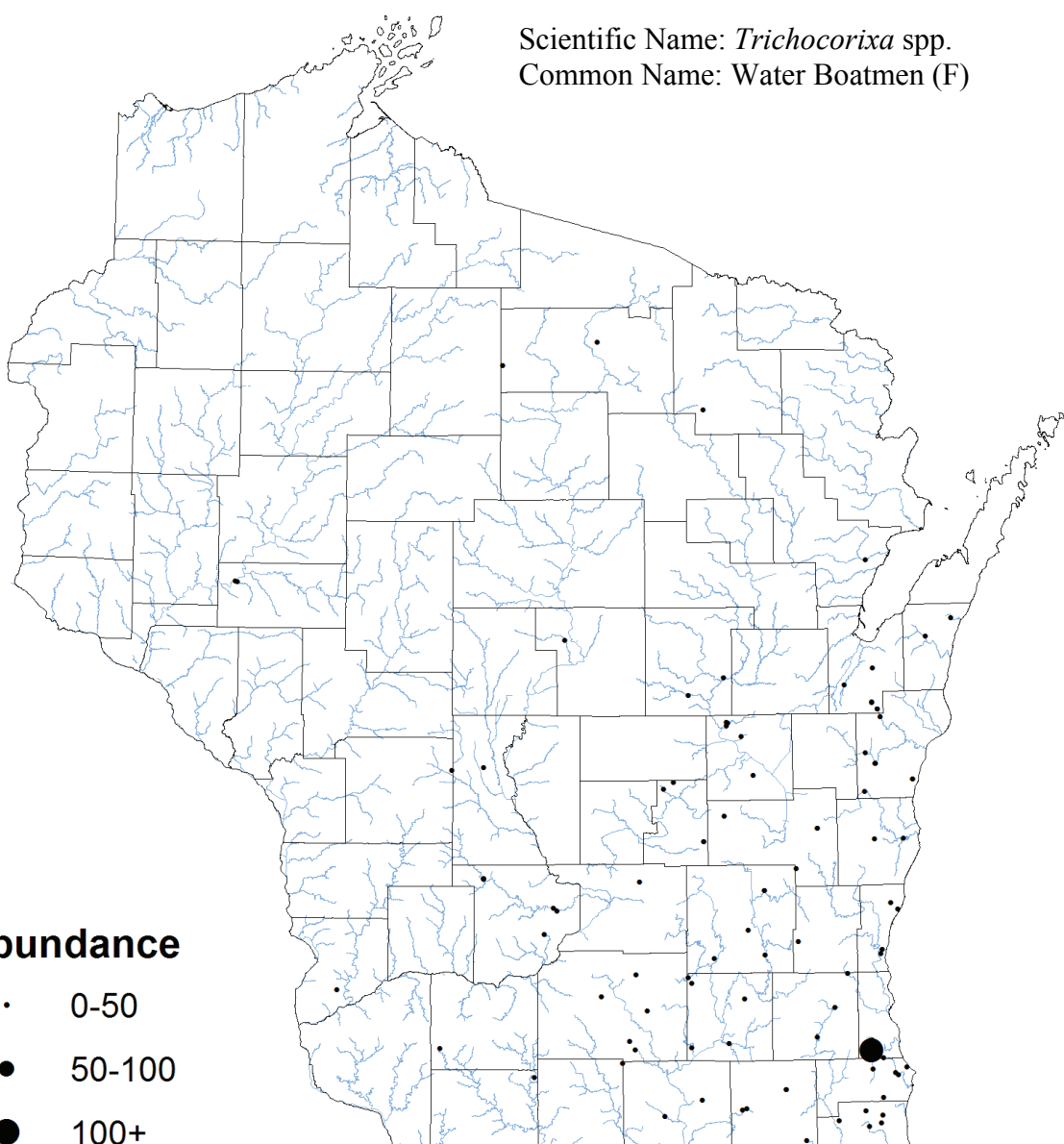


# Hemiptera Corixidae

Scientific Name: *Trichocorixa* spp.  
 Common Name: Water Boatmen (F)

## Abundance

- 0-50
- 50-100
- 100+

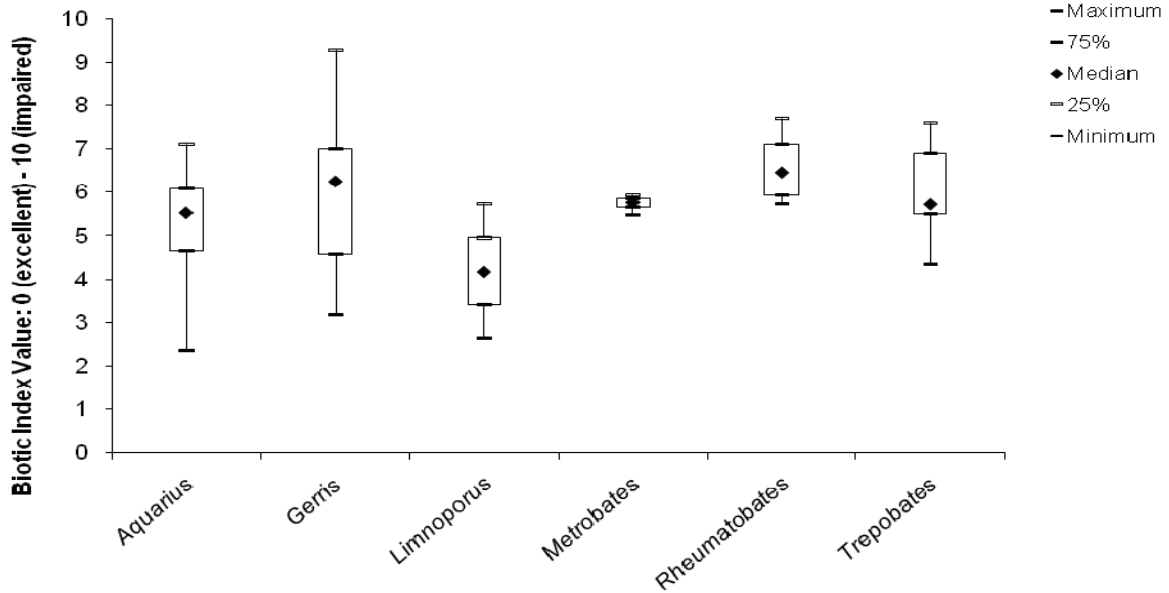
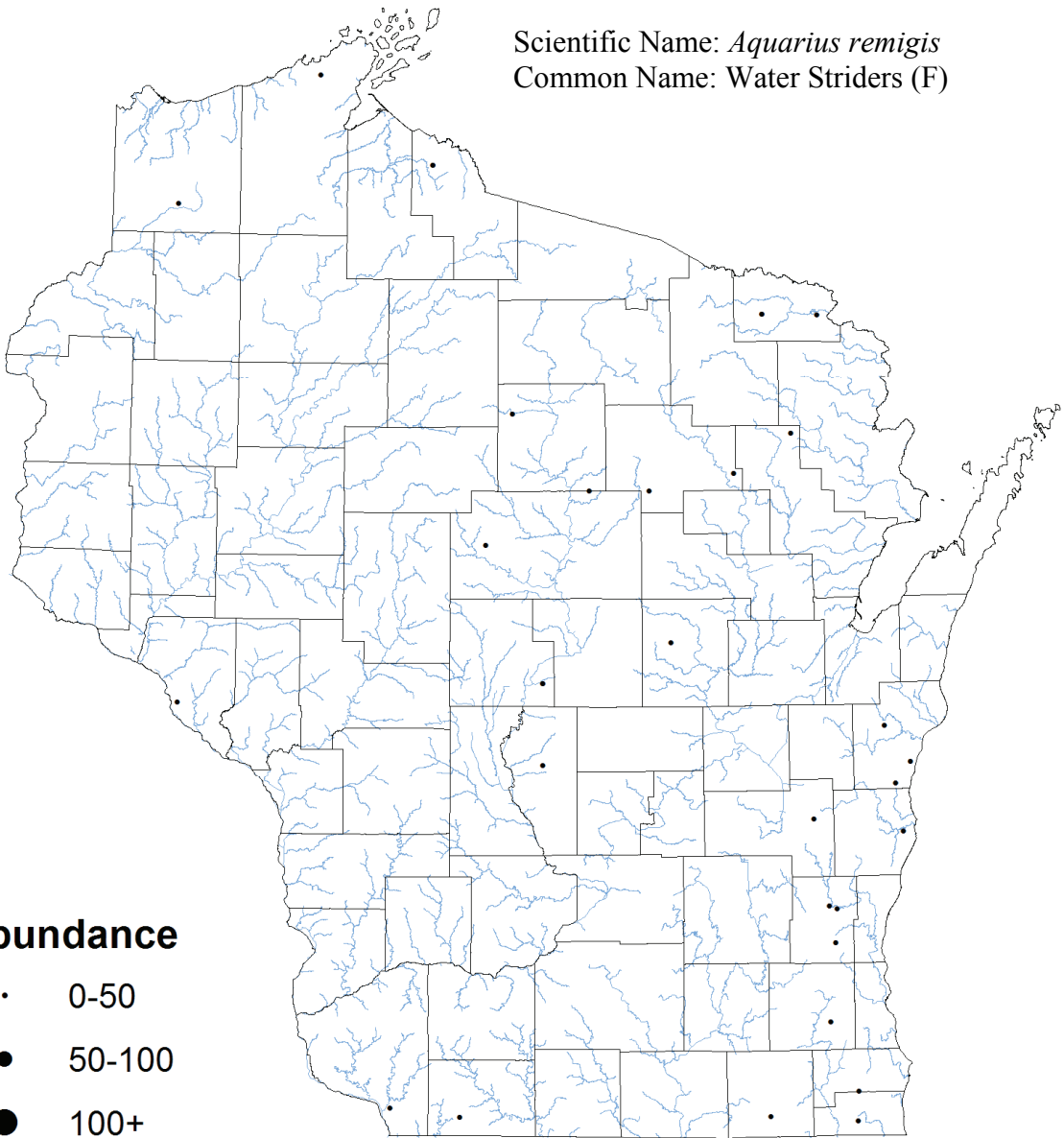


# Hemiptera Gerridae

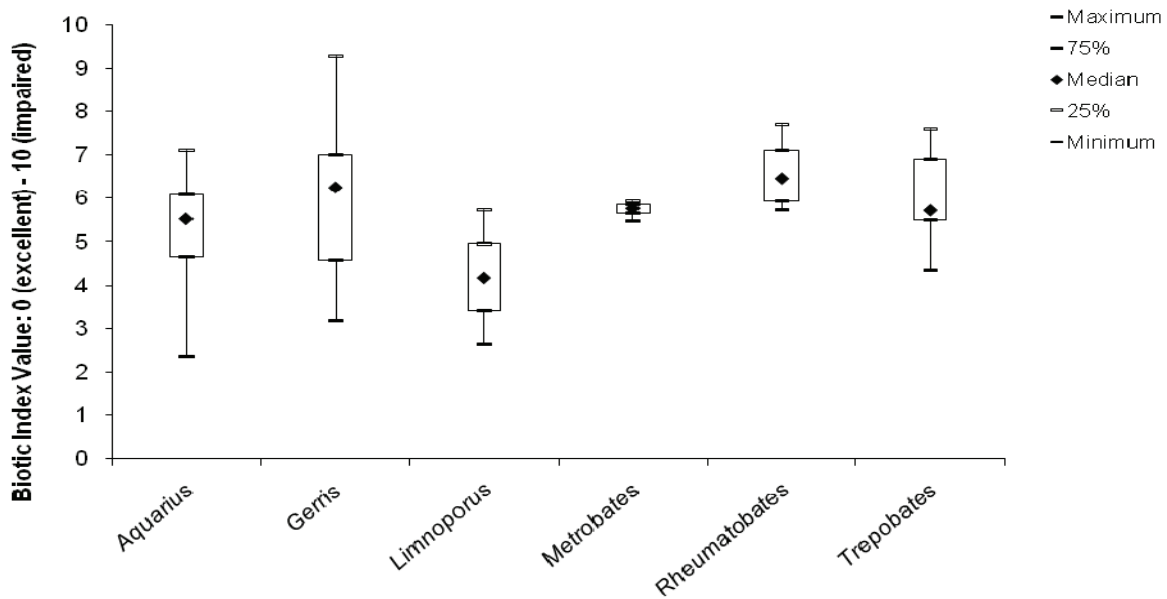
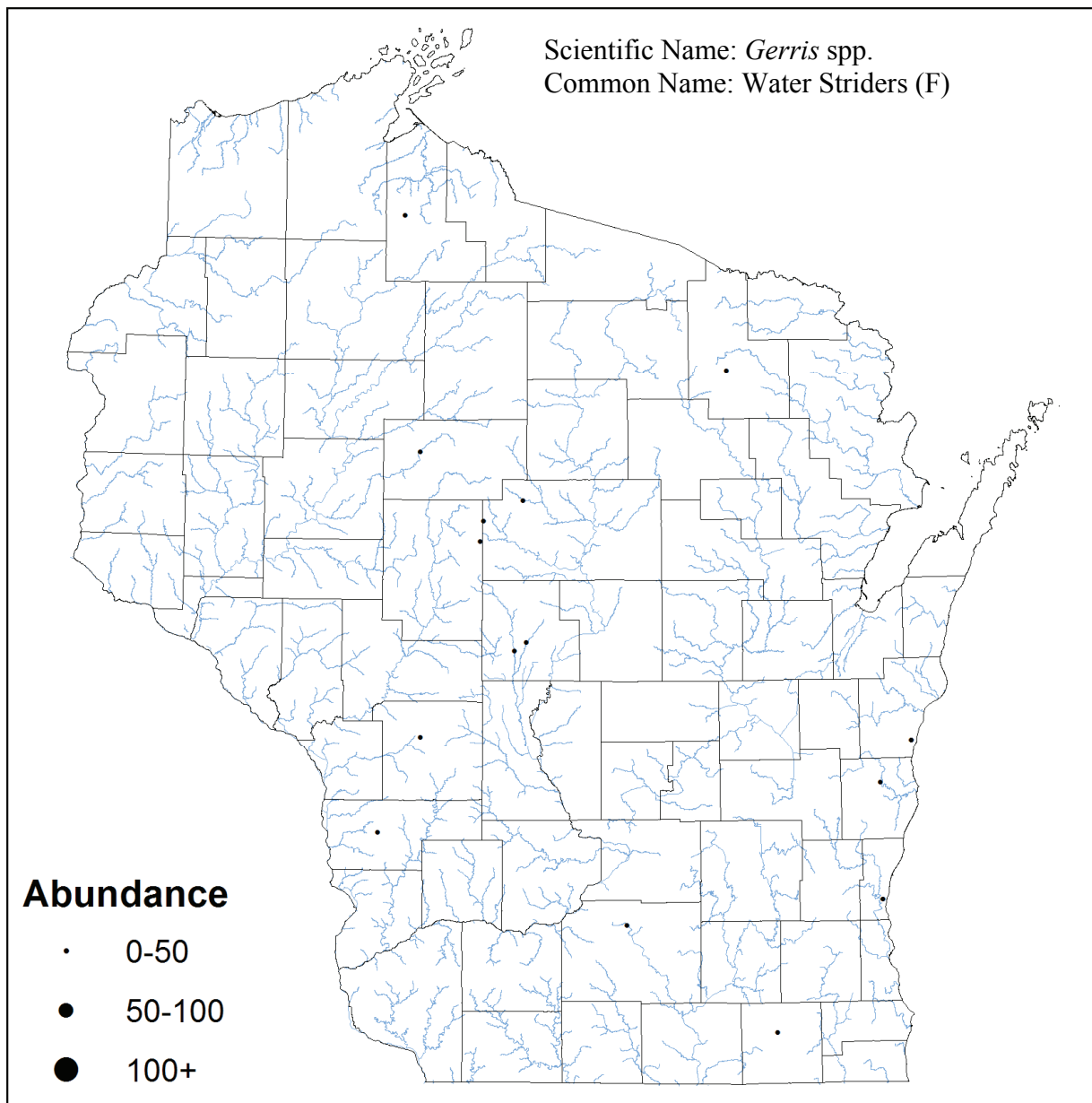
Scientific Name: *Aquarius remigis*  
 Common Name: Water Striders (F)

## Abundance

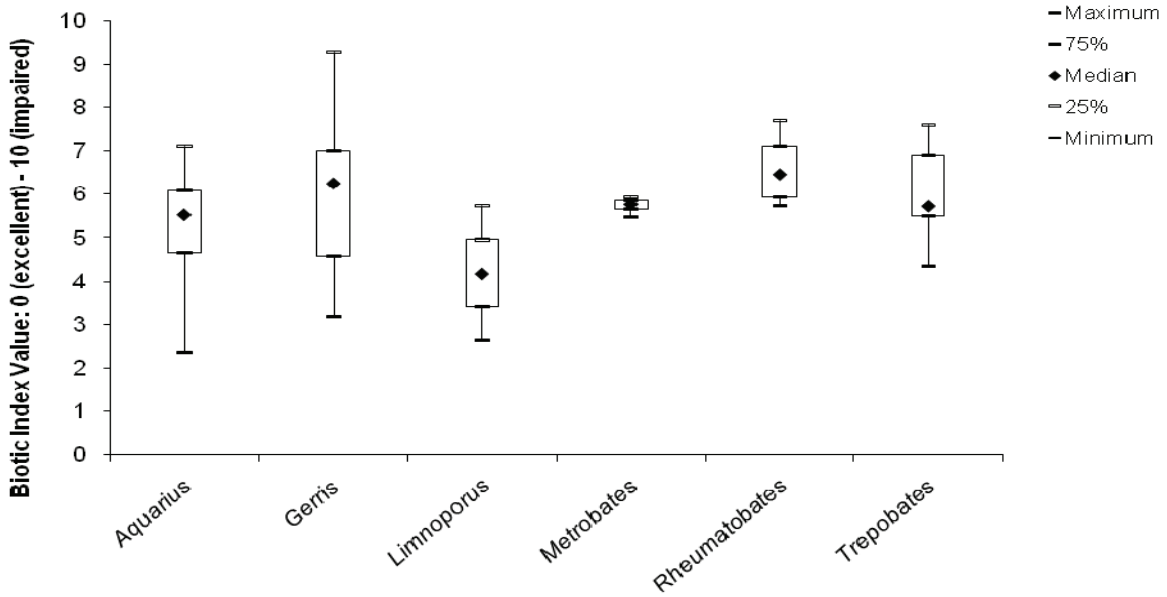
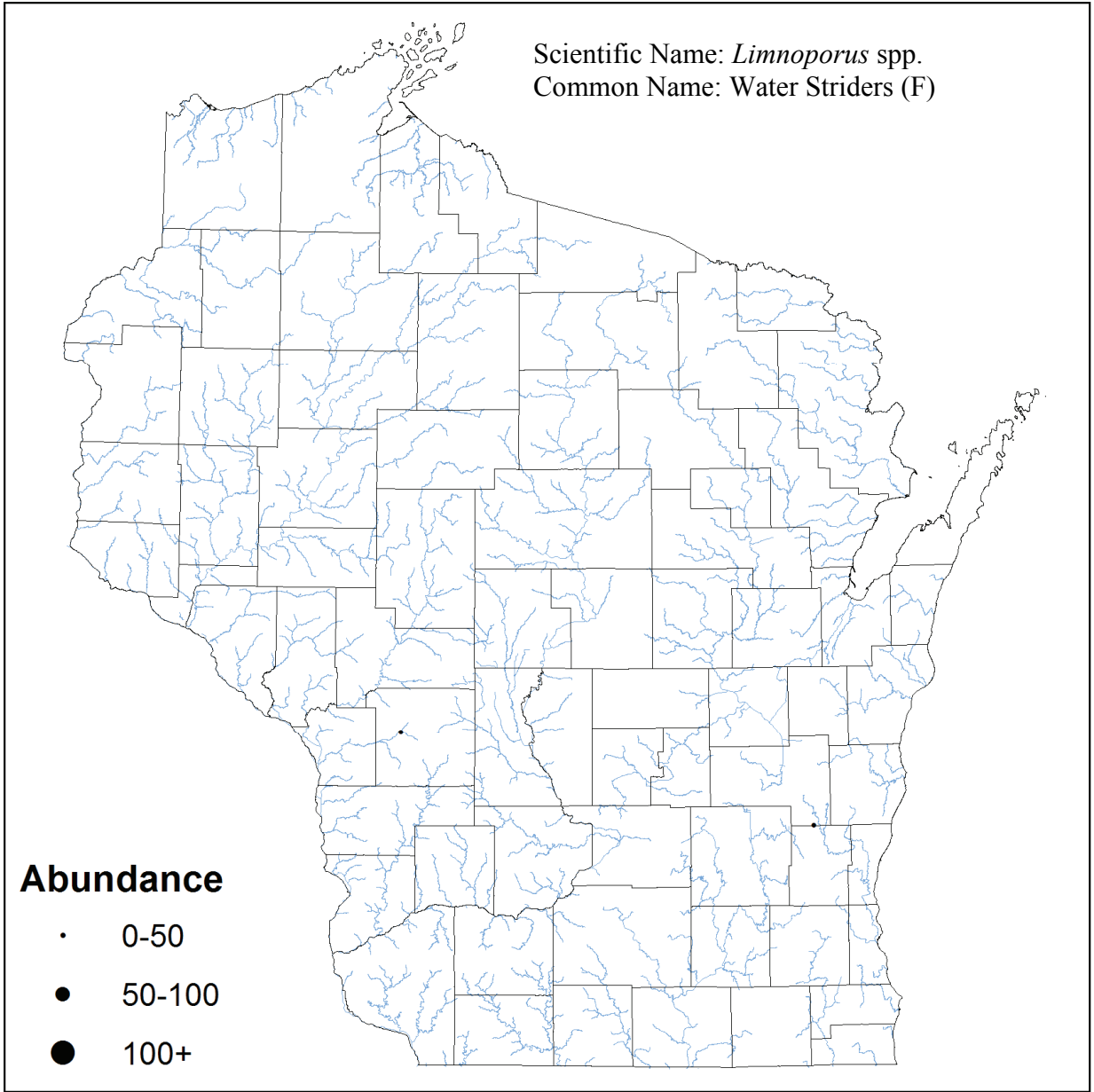
- 0-50
- 50-100
- 100+



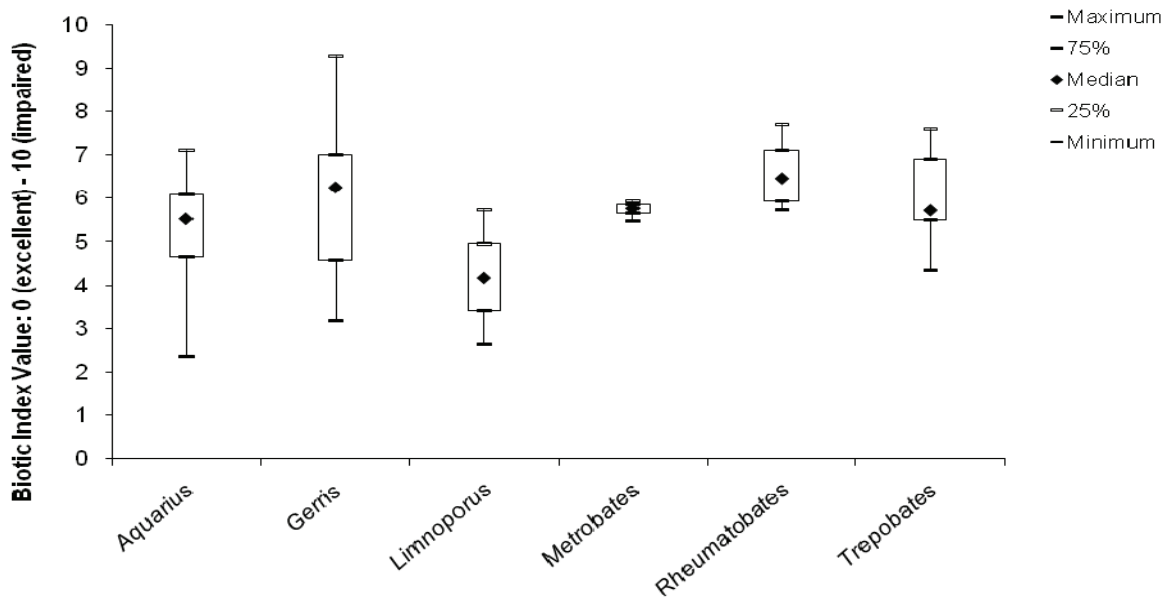
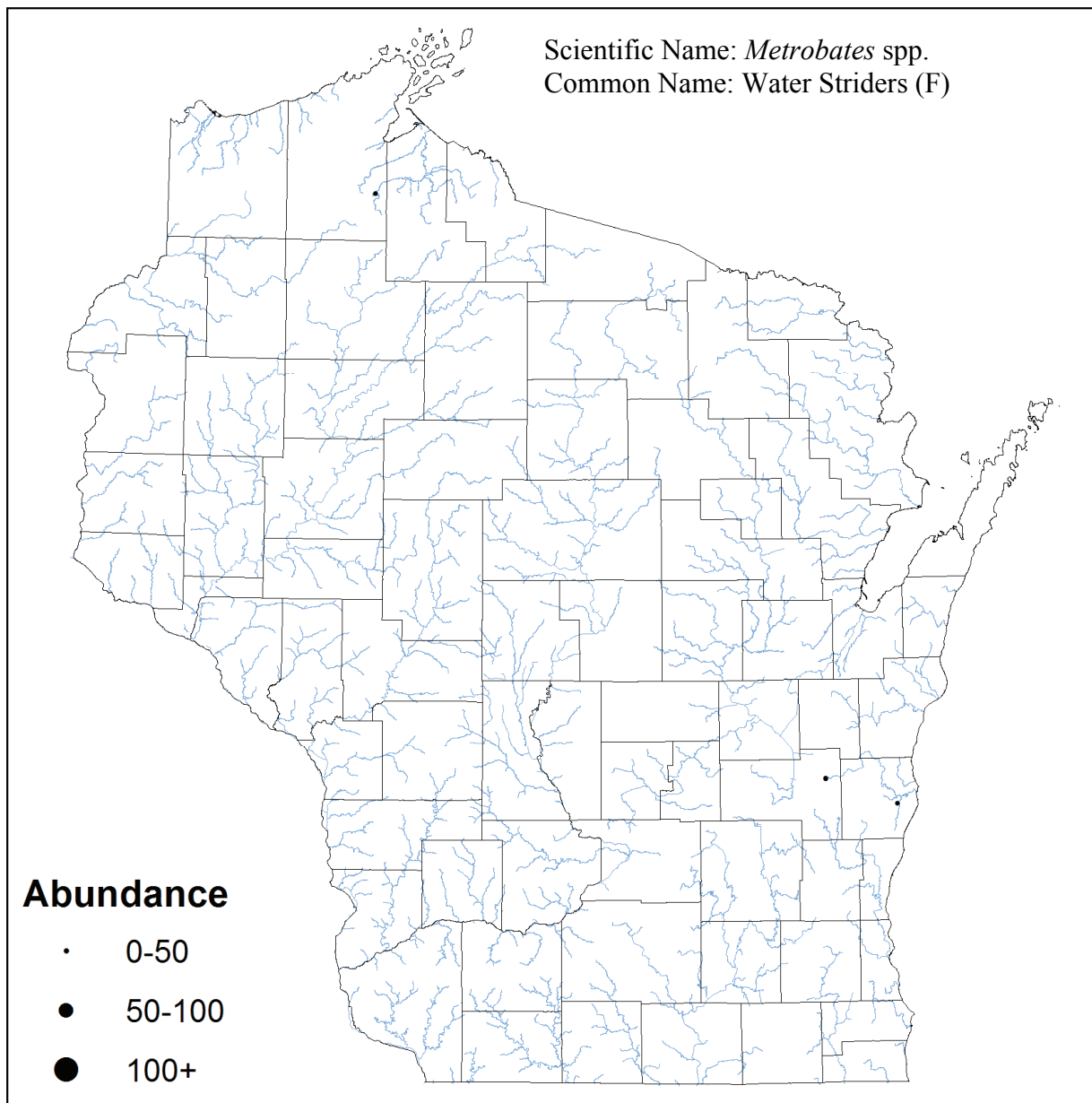
# Hemiptera Gerridae



# Hemiptera Gerridae



# Hemiptera Gerridae

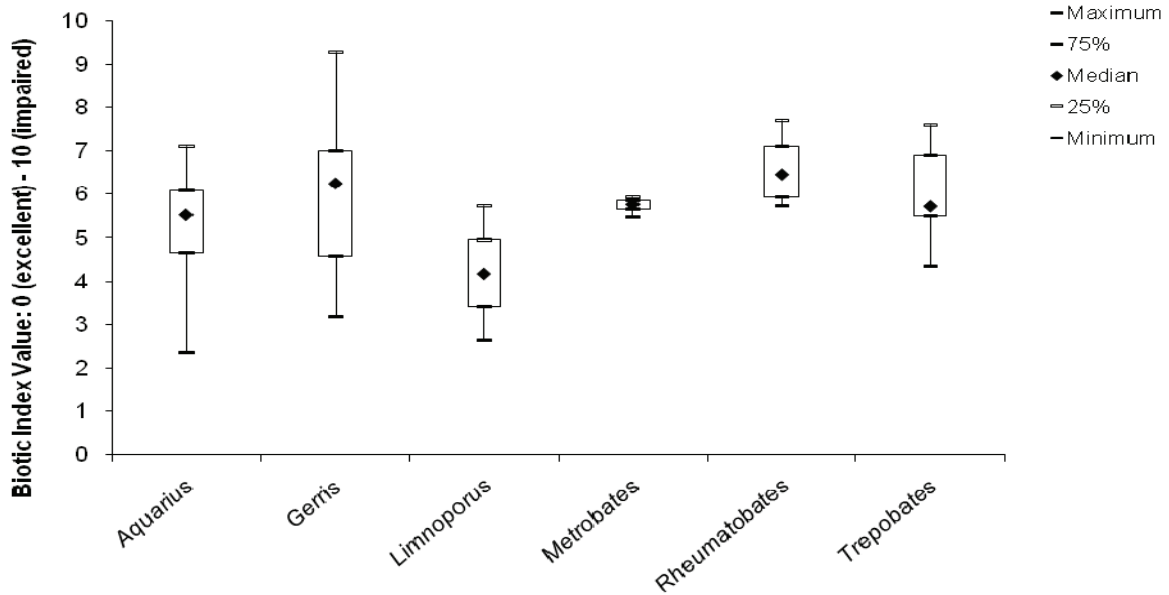
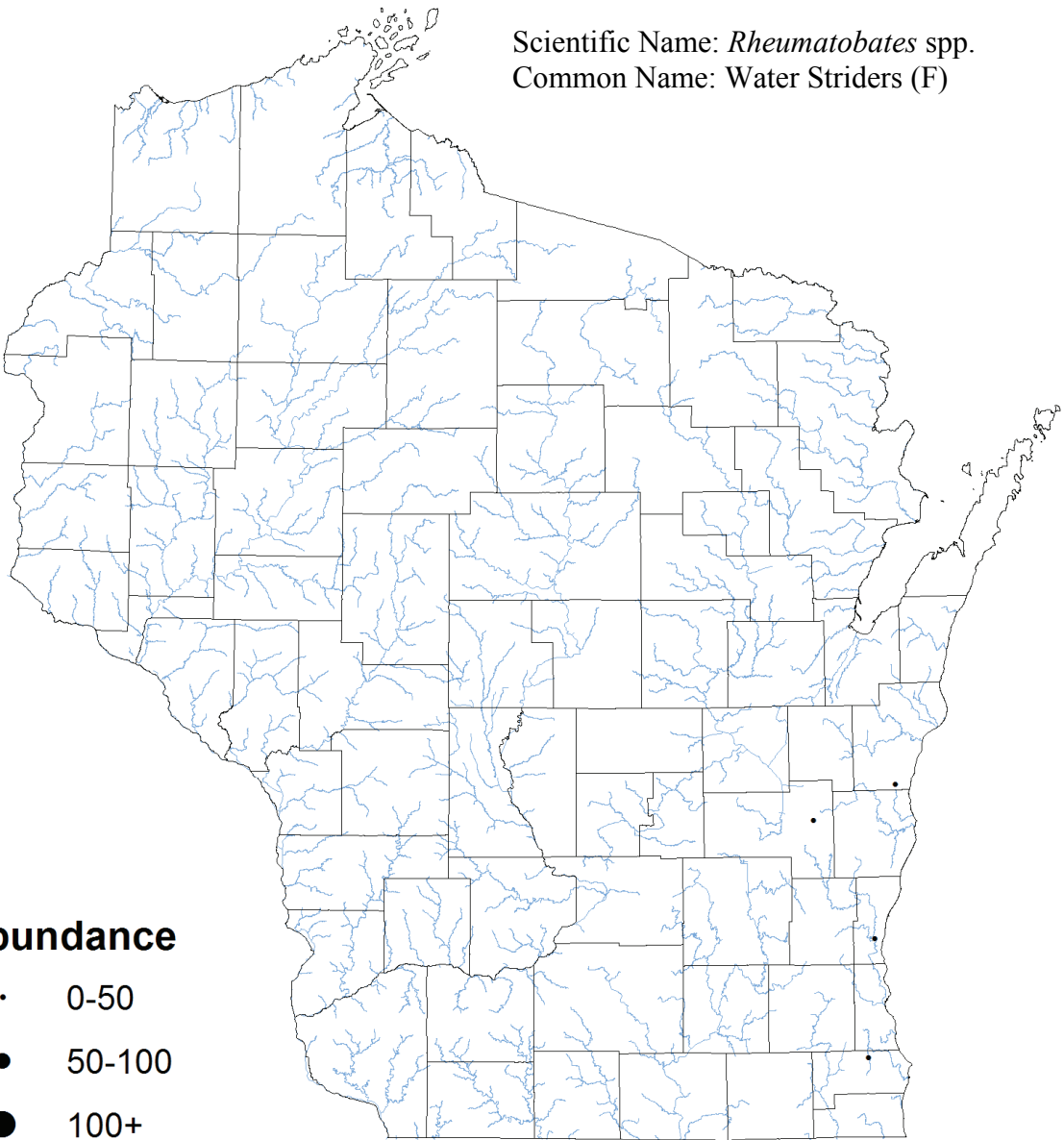


# Hemiptera Gerridae

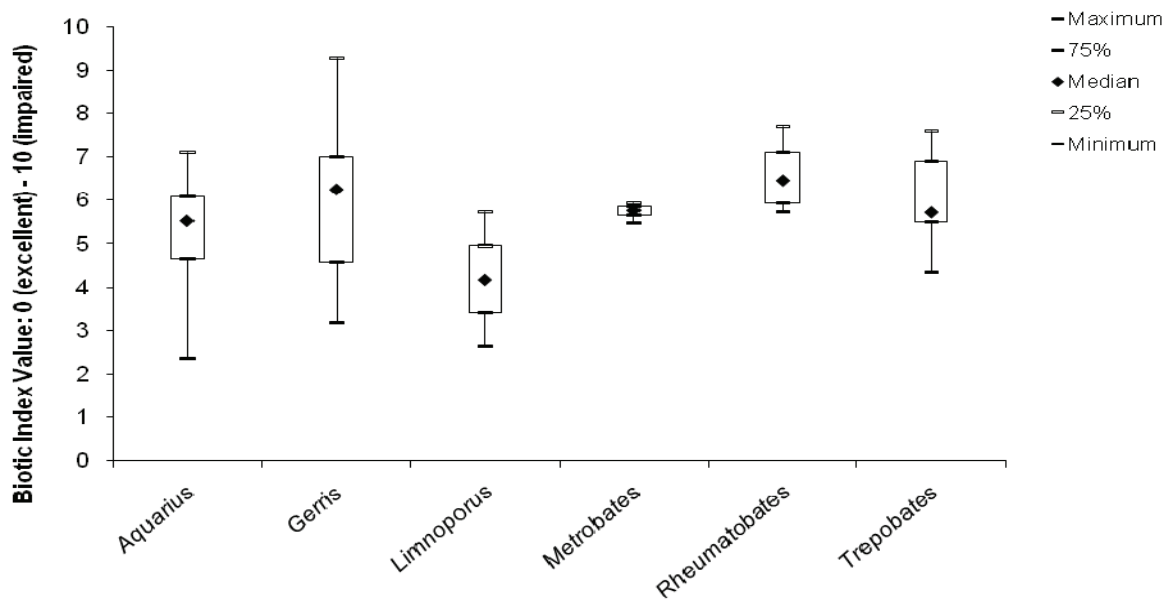
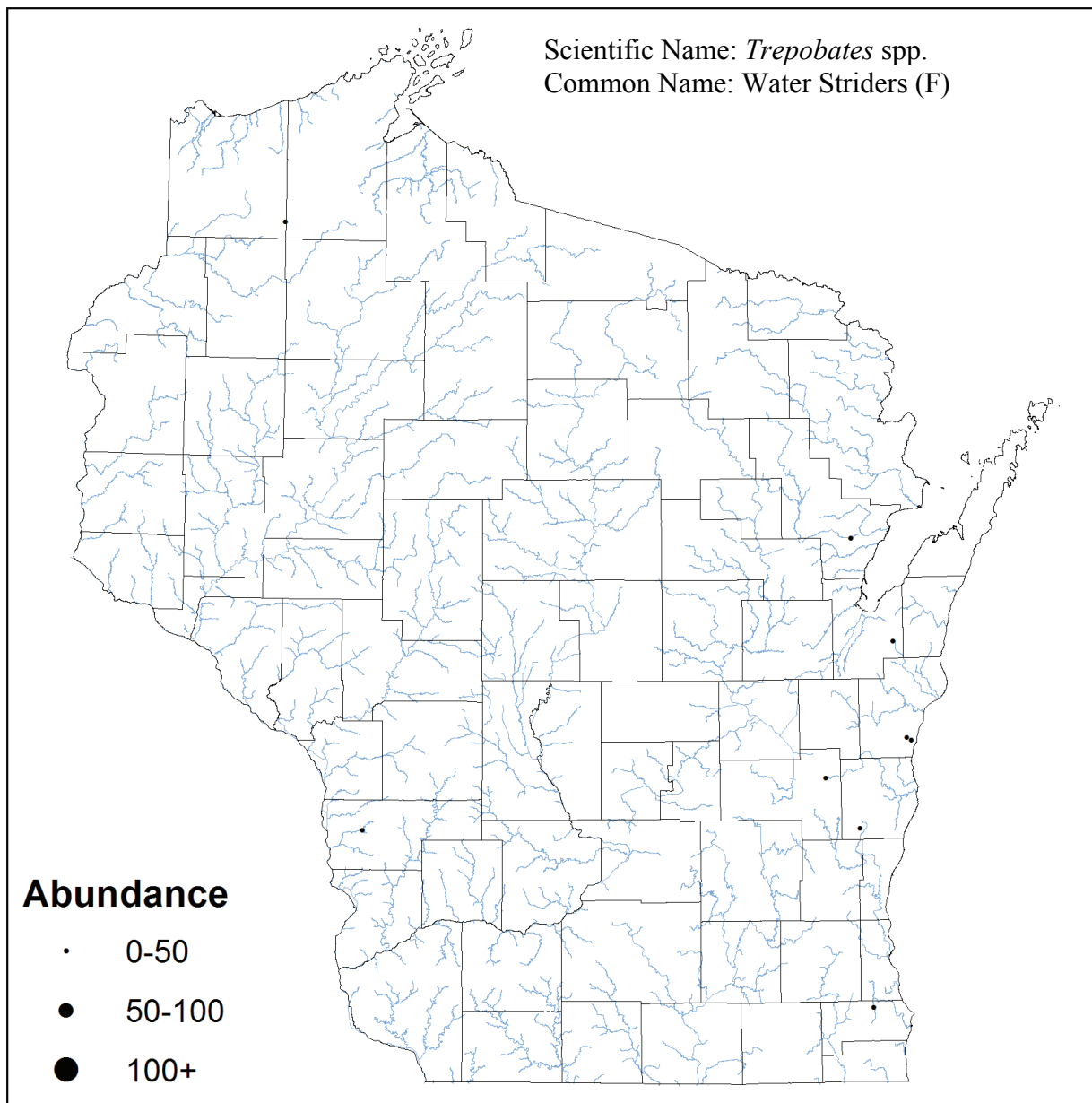
Scientific Name: *Rheumatobates* spp.  
 Common Name: Water Striders (F)

## Abundance

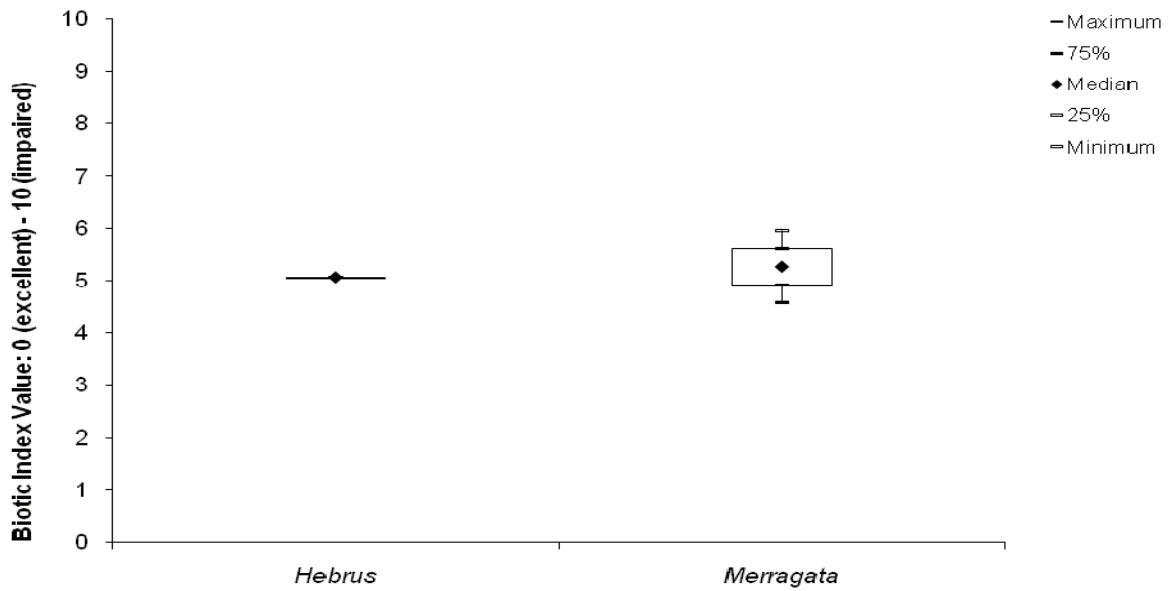
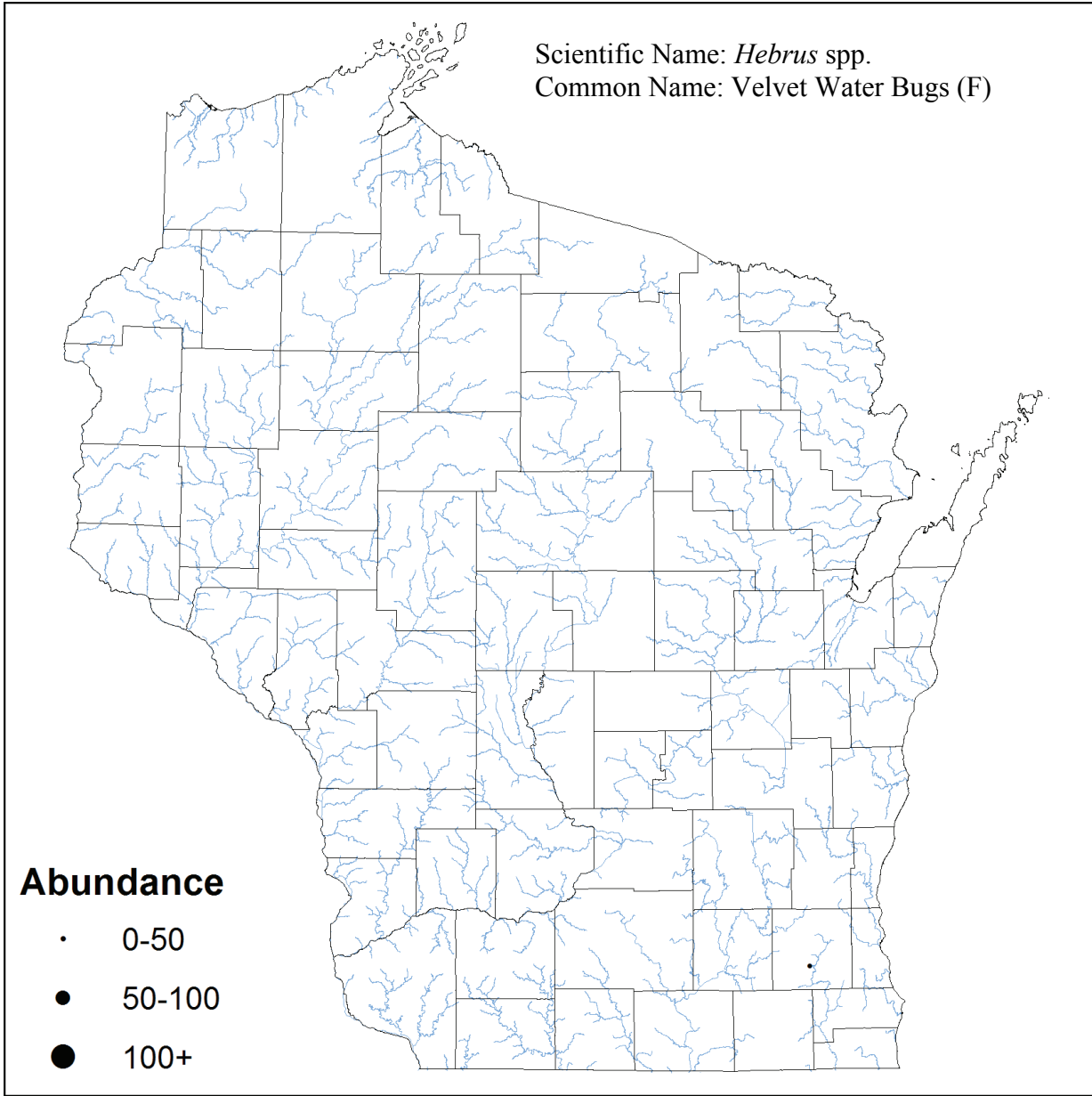
- 0-50
- 50-100
- 100+



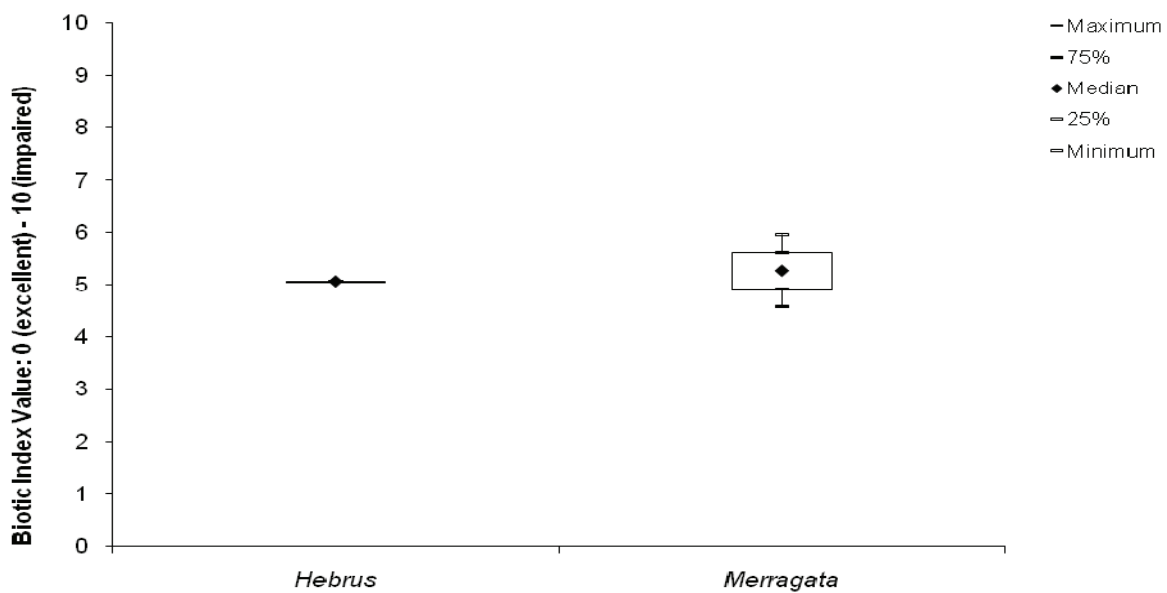
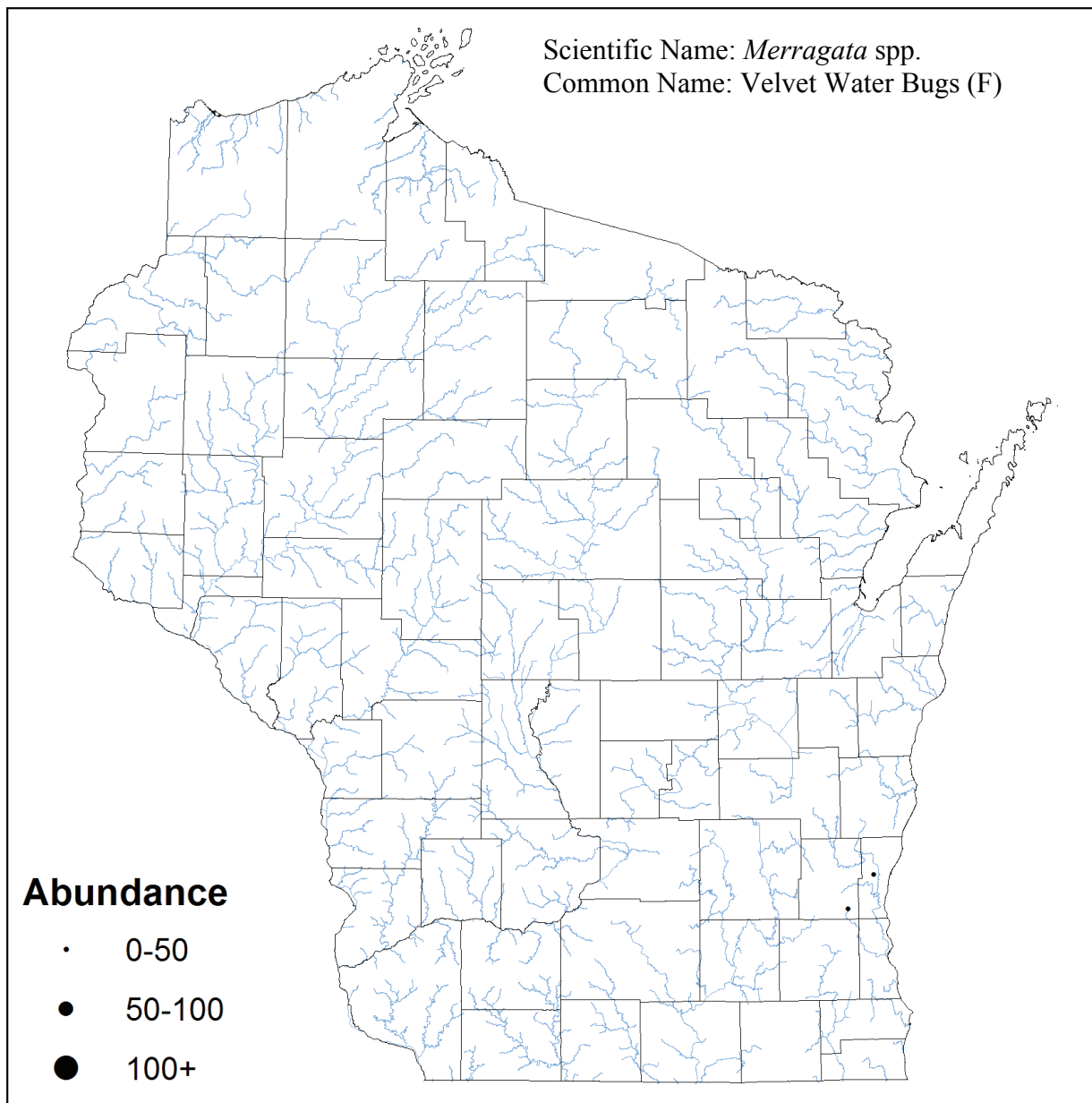
# Hemiptera Gerridae



# Hemiptera Hebridae





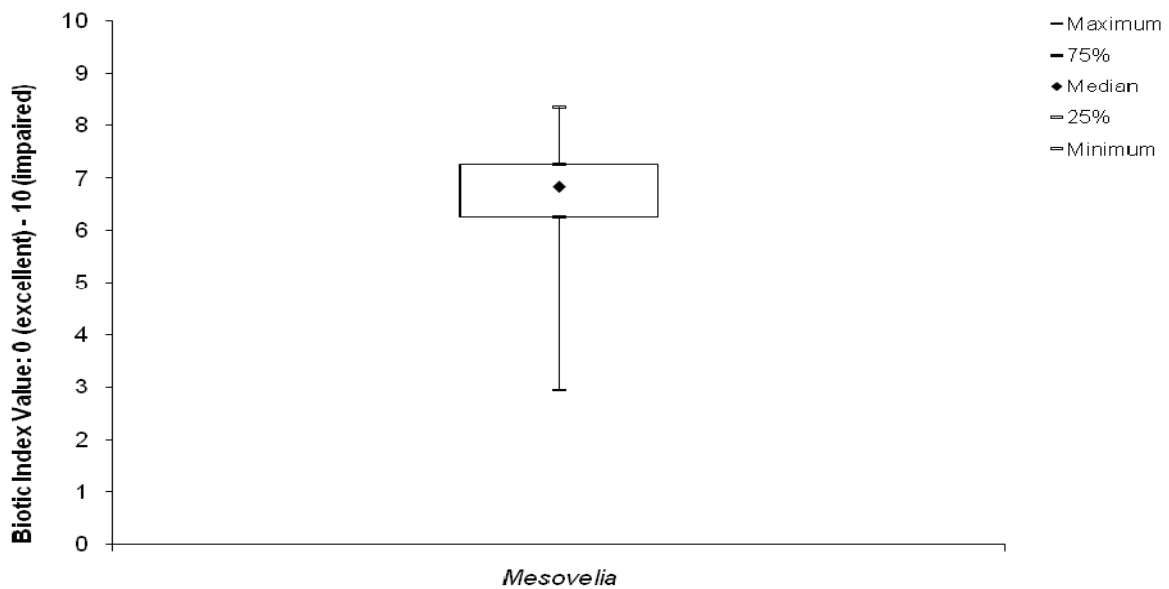
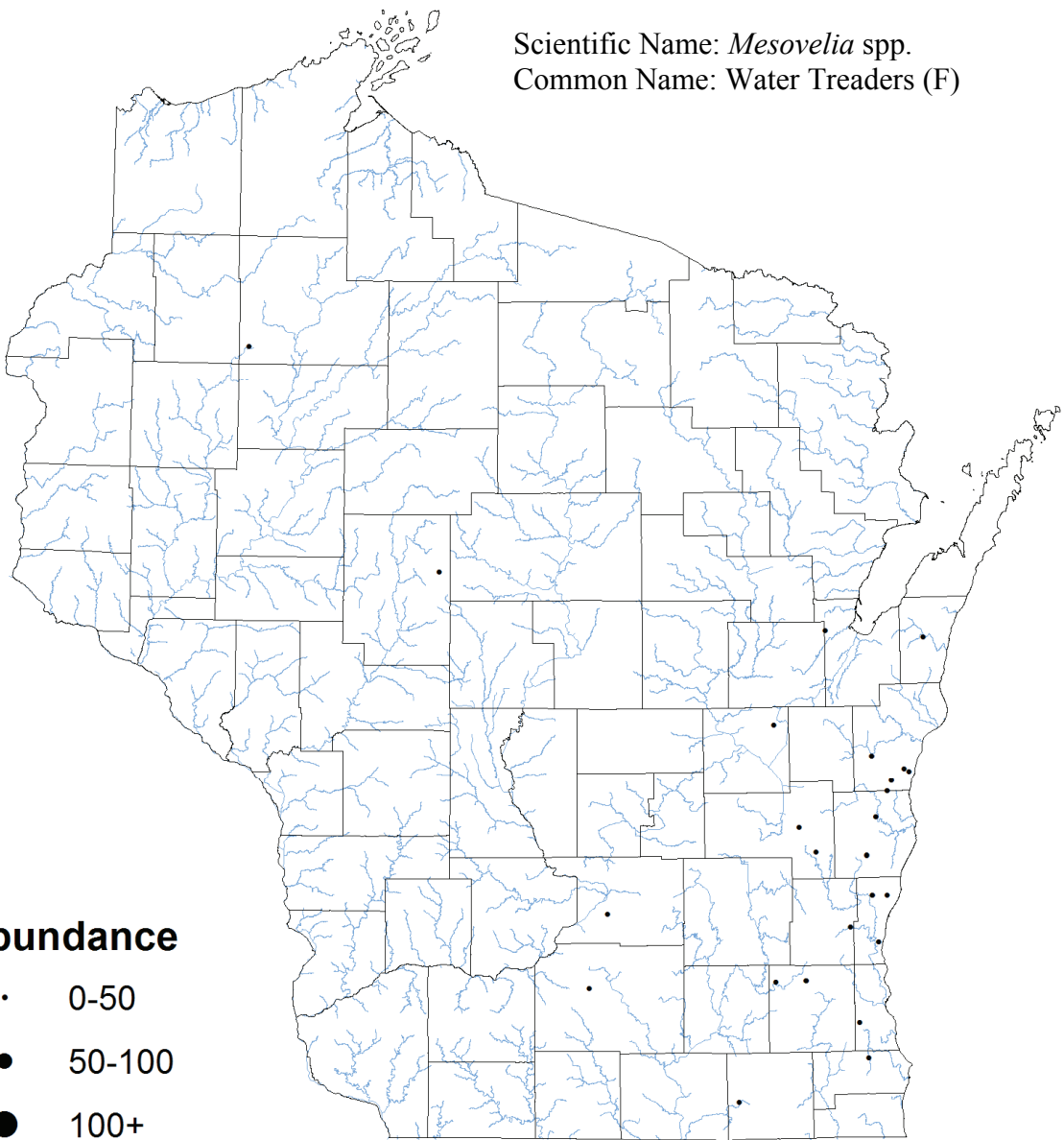


# Hemiptera Mesovelidae

Scientific Name: *Mesovelia* spp.  
Common Name: Water Treaders (F)

## Abundance

- 0-50
- 50-100
- 100+

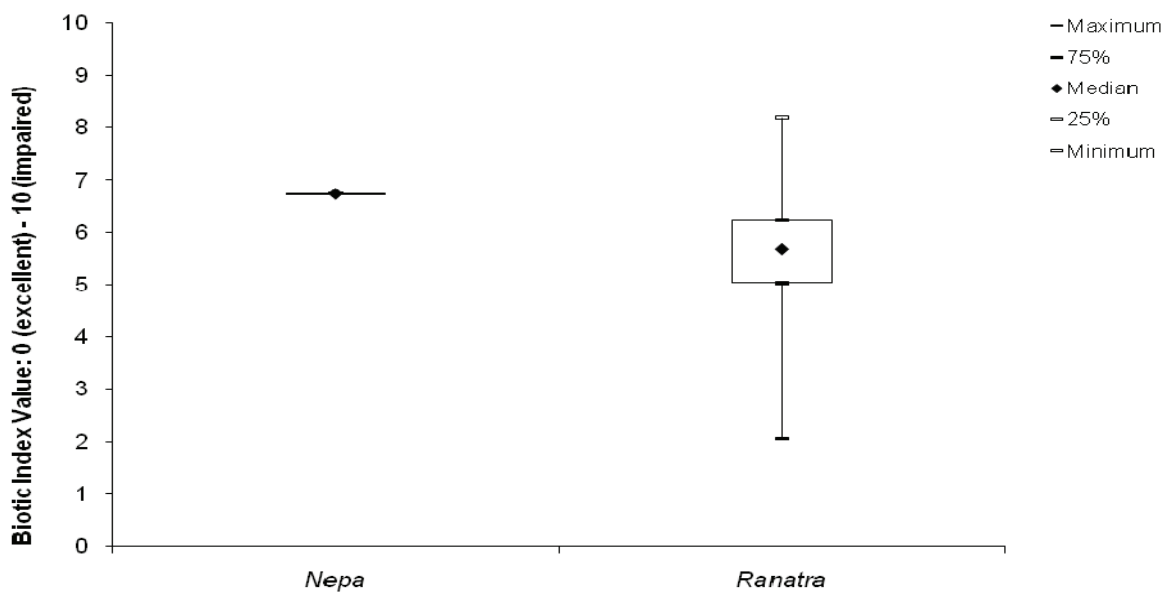
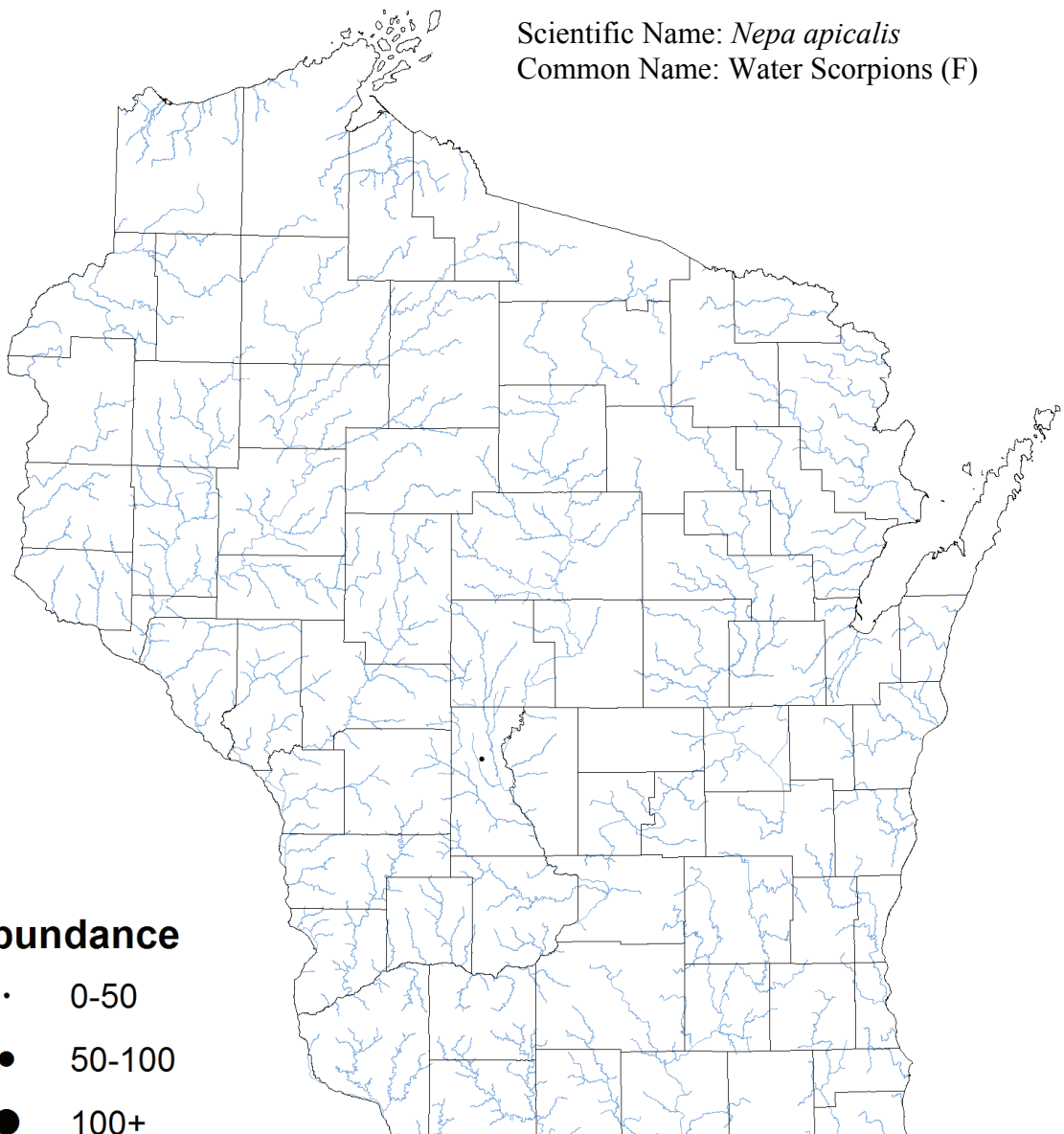


# Hemiptera Nepidae

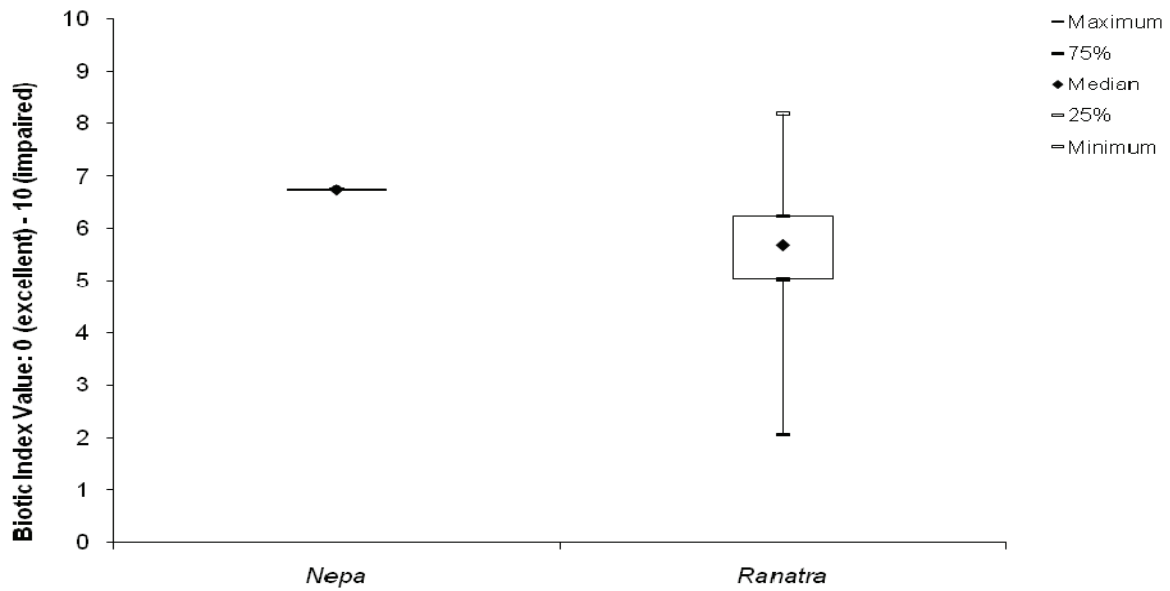
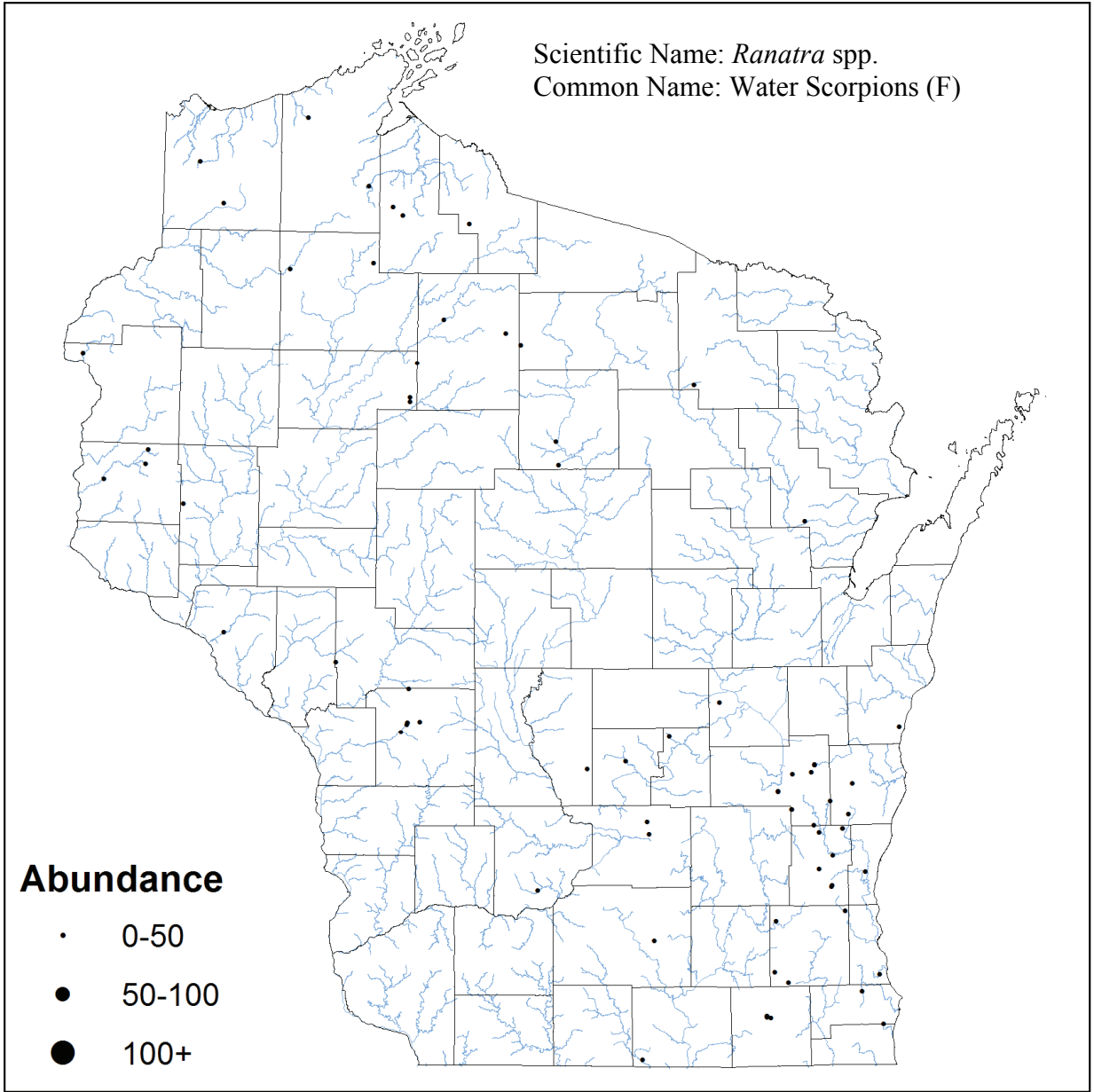
Scientific Name: *Nepa apicalis*  
Common Name: Water Scorpions (F)

## Abundance

- 0-50
- 50-100
- 100+



# Hemiptera Nepidae

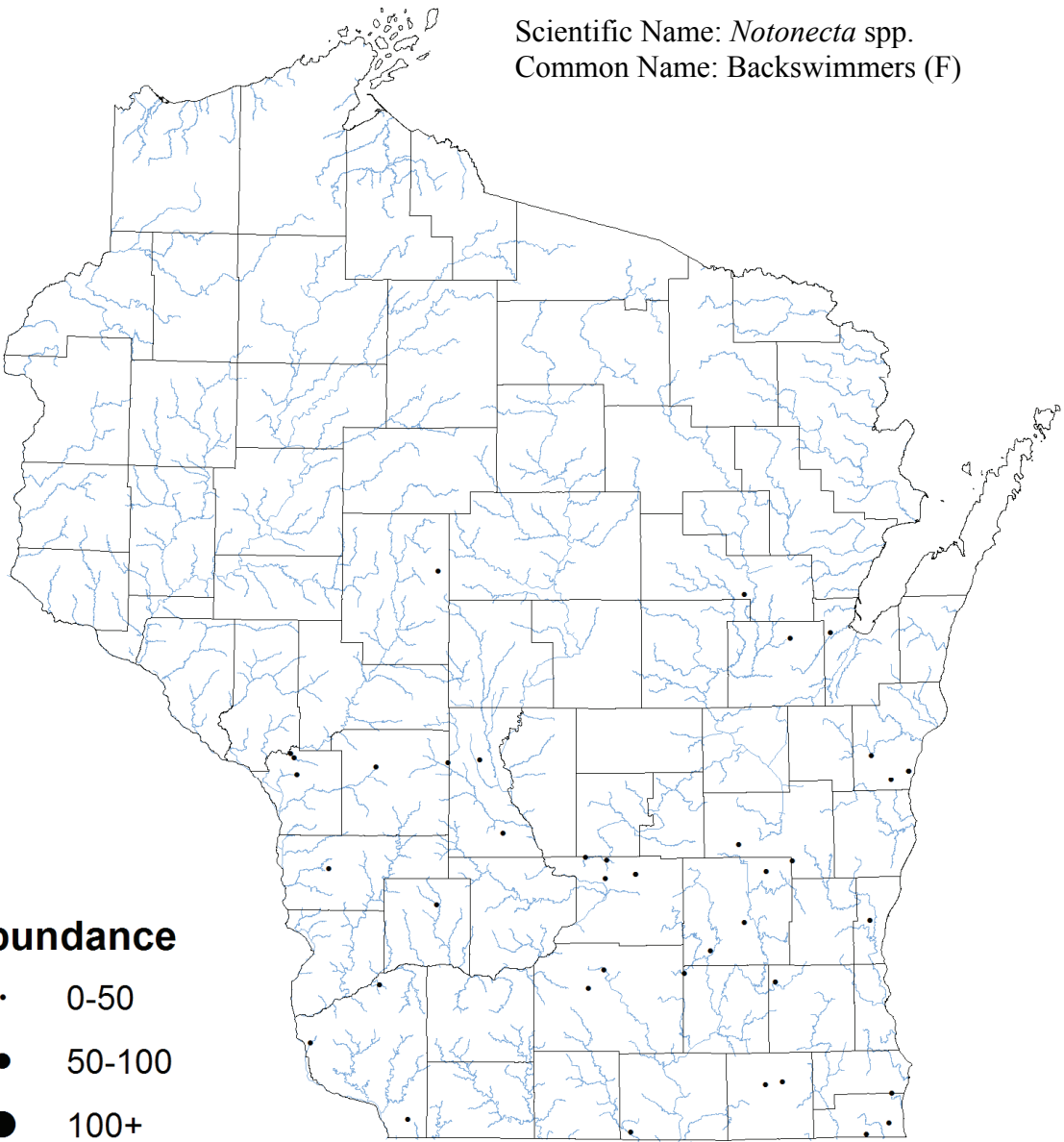


# Hemiptera Notonectidae

Scientific Name: *Notonecta* spp.  
Common Name: Backswimmers (F)

## Abundance

- 0-50
- 50-100
- 100+

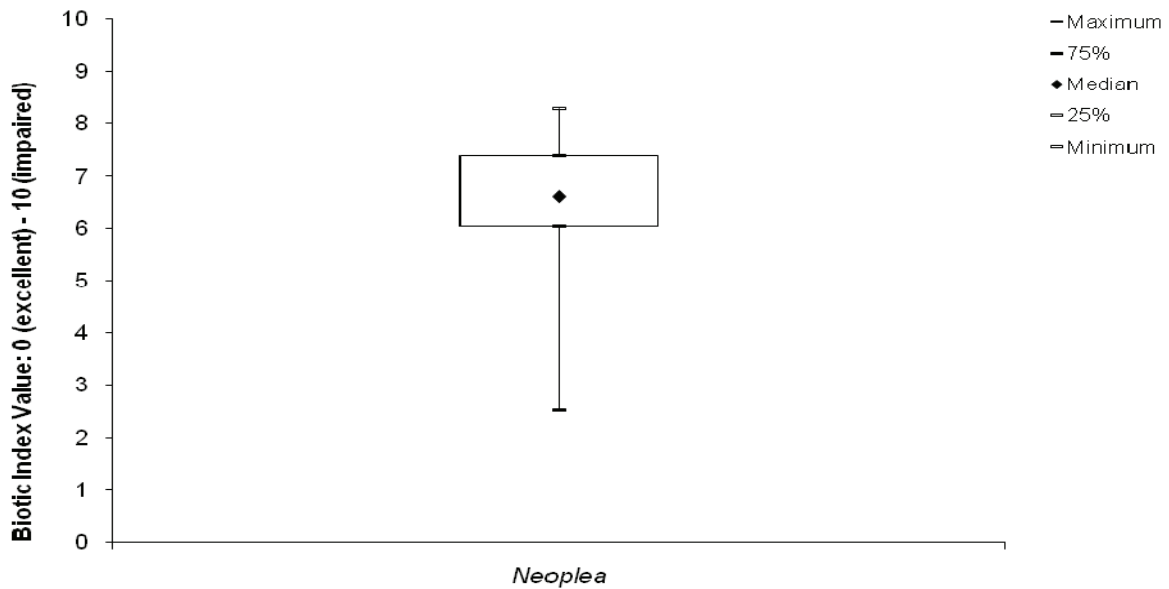
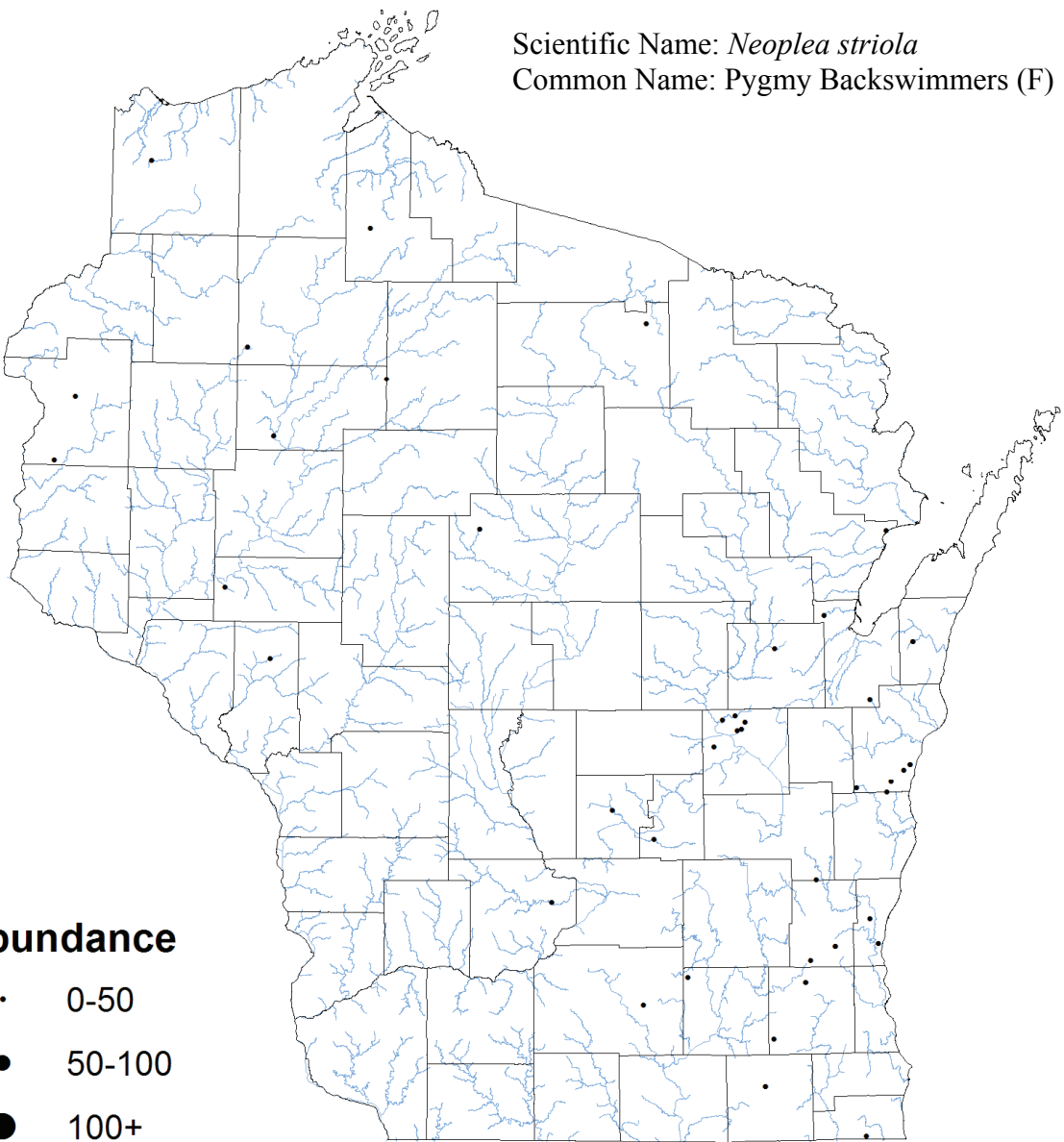


# Hemiptera Pleidae

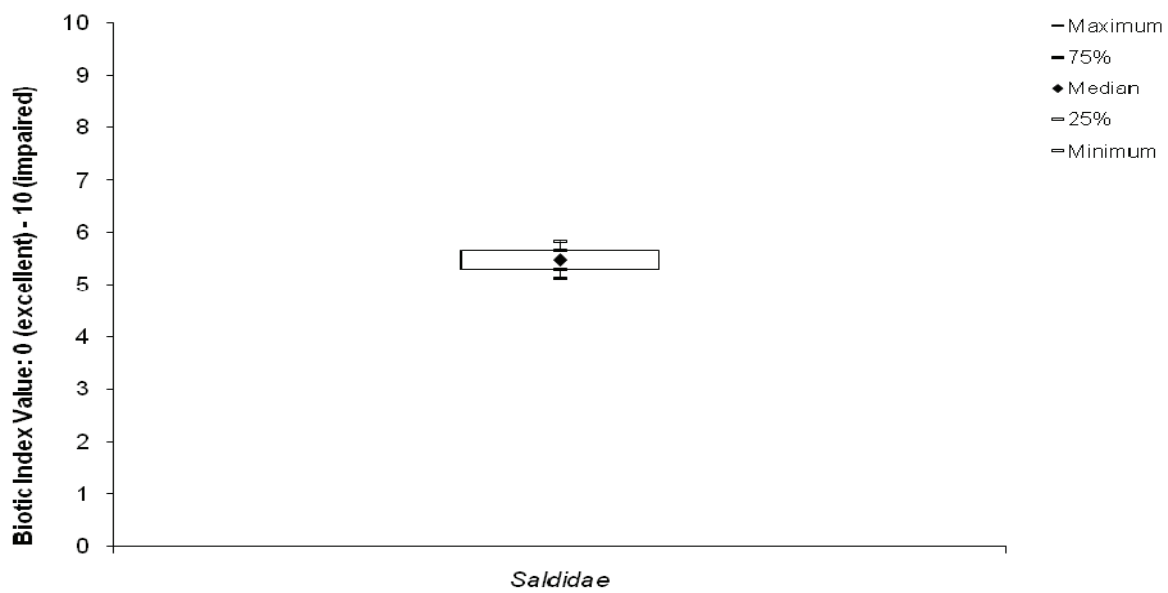
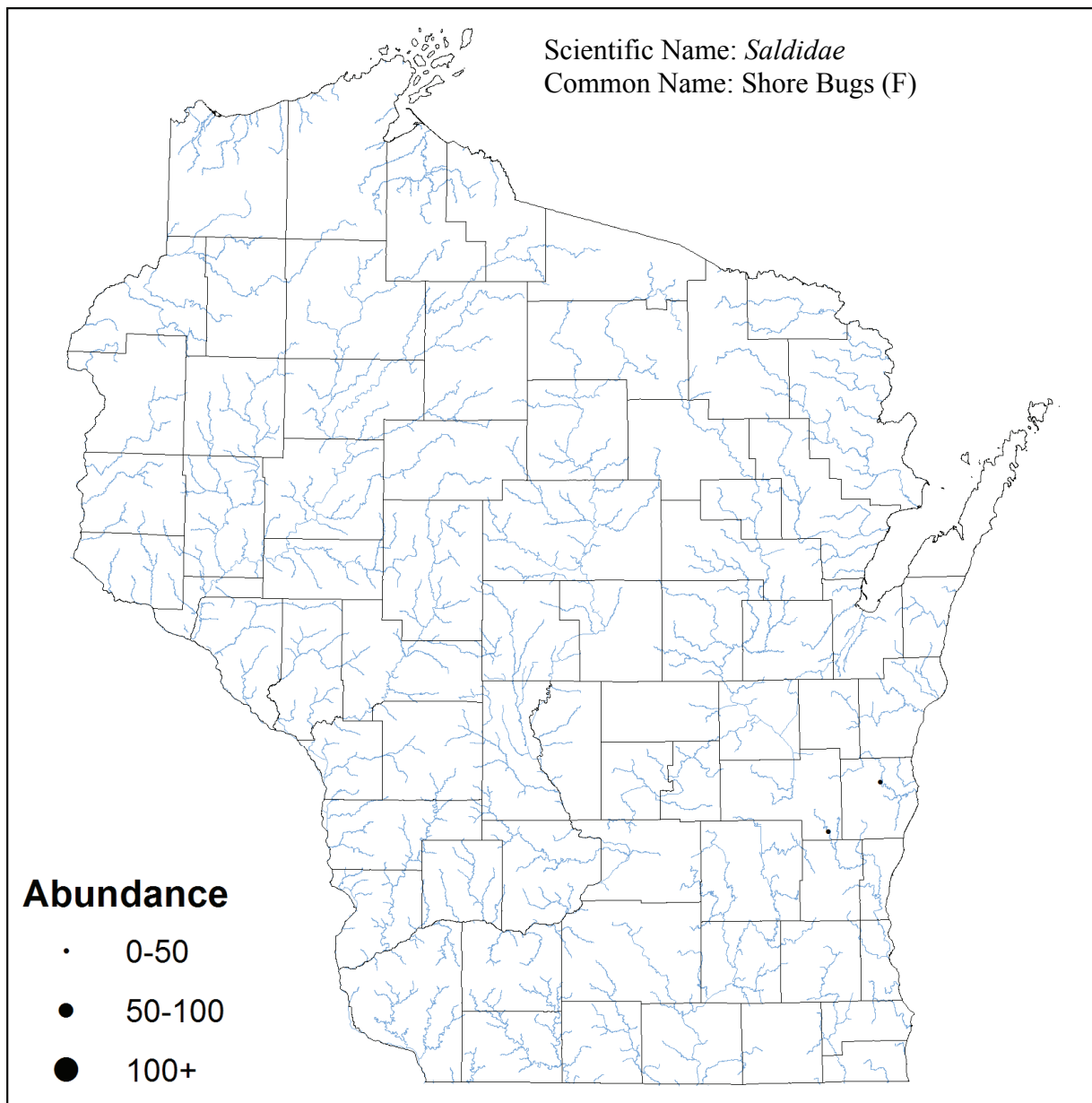
Scientific Name: *Neoplea striola*  
Common Name: Pygmy Backswimmers (F)

## Abundance

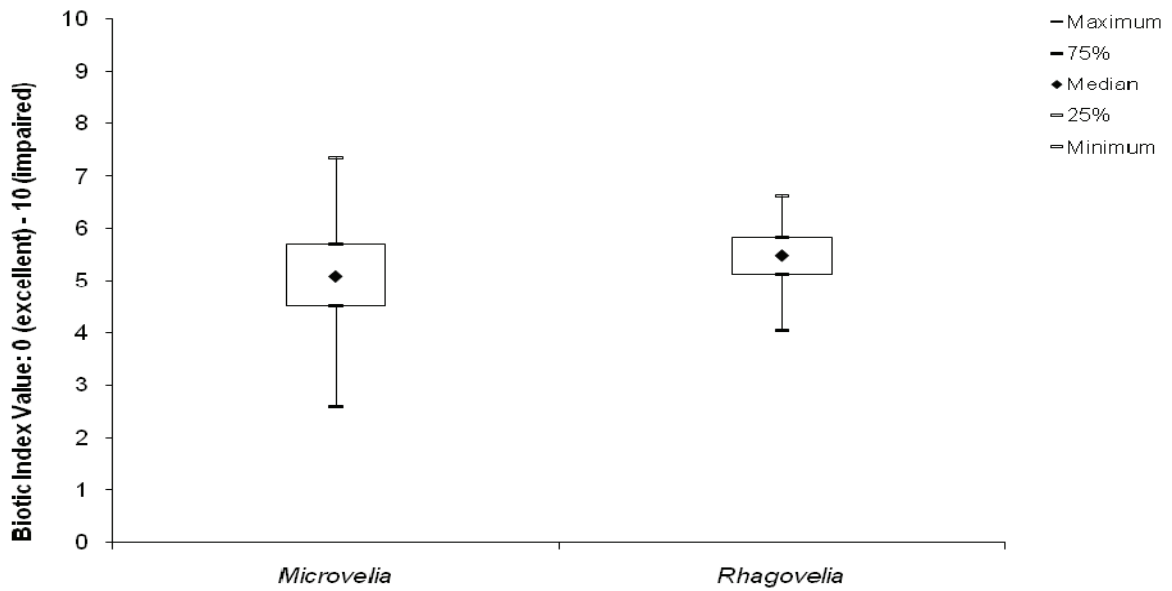
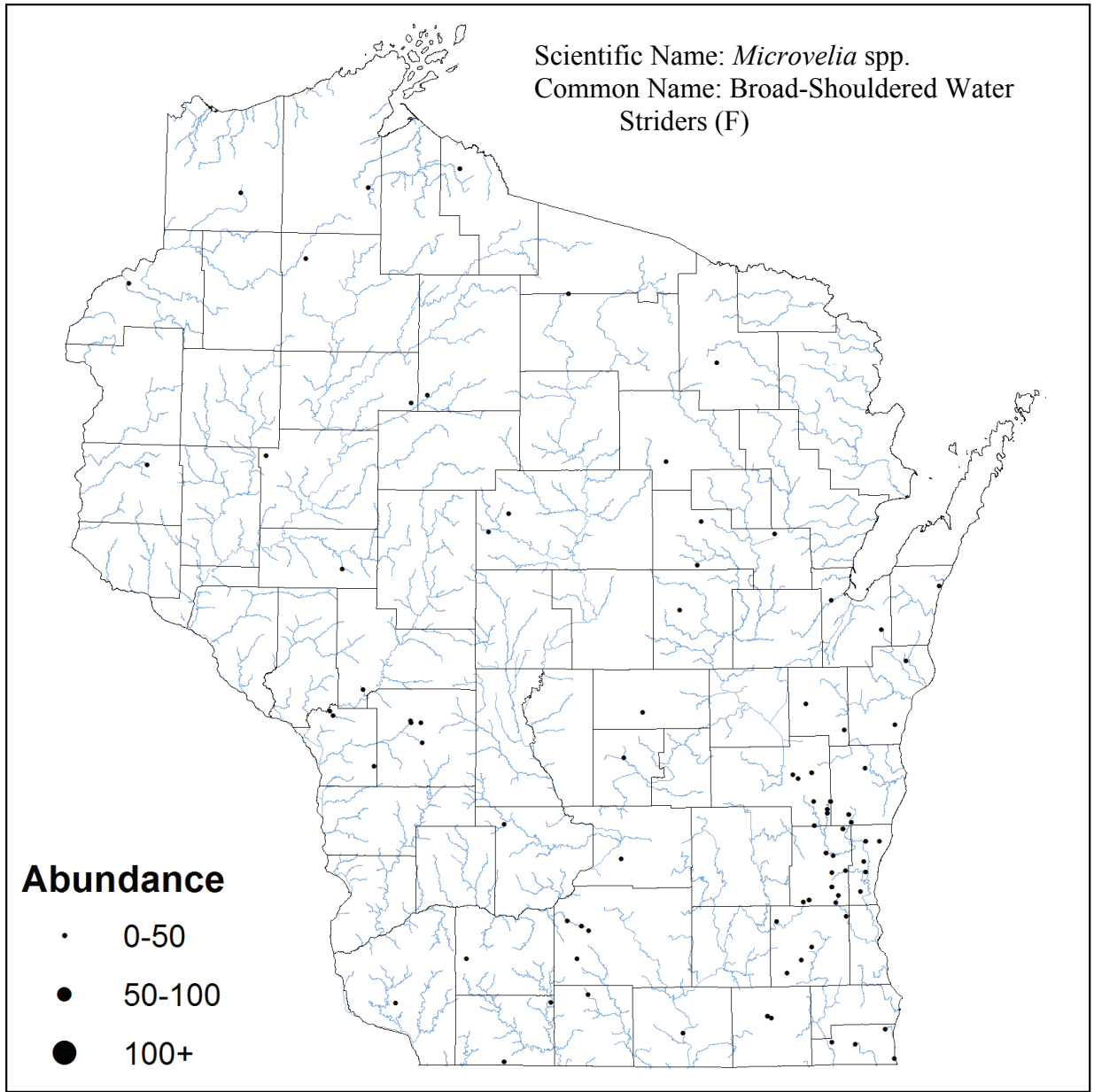
- 0-50
- 50-100
- 100+



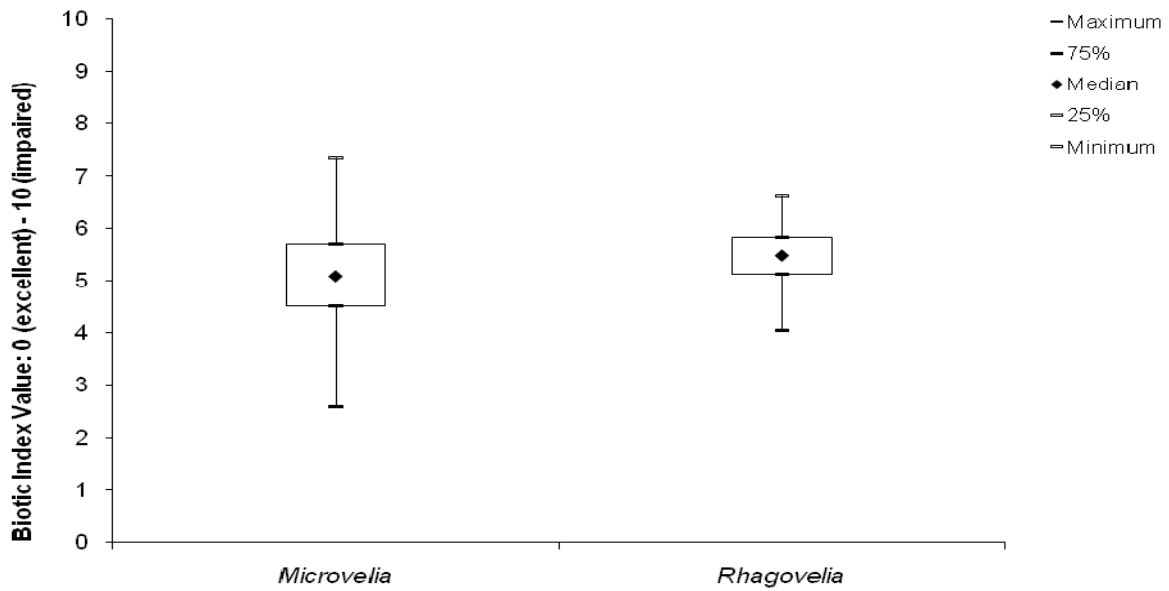
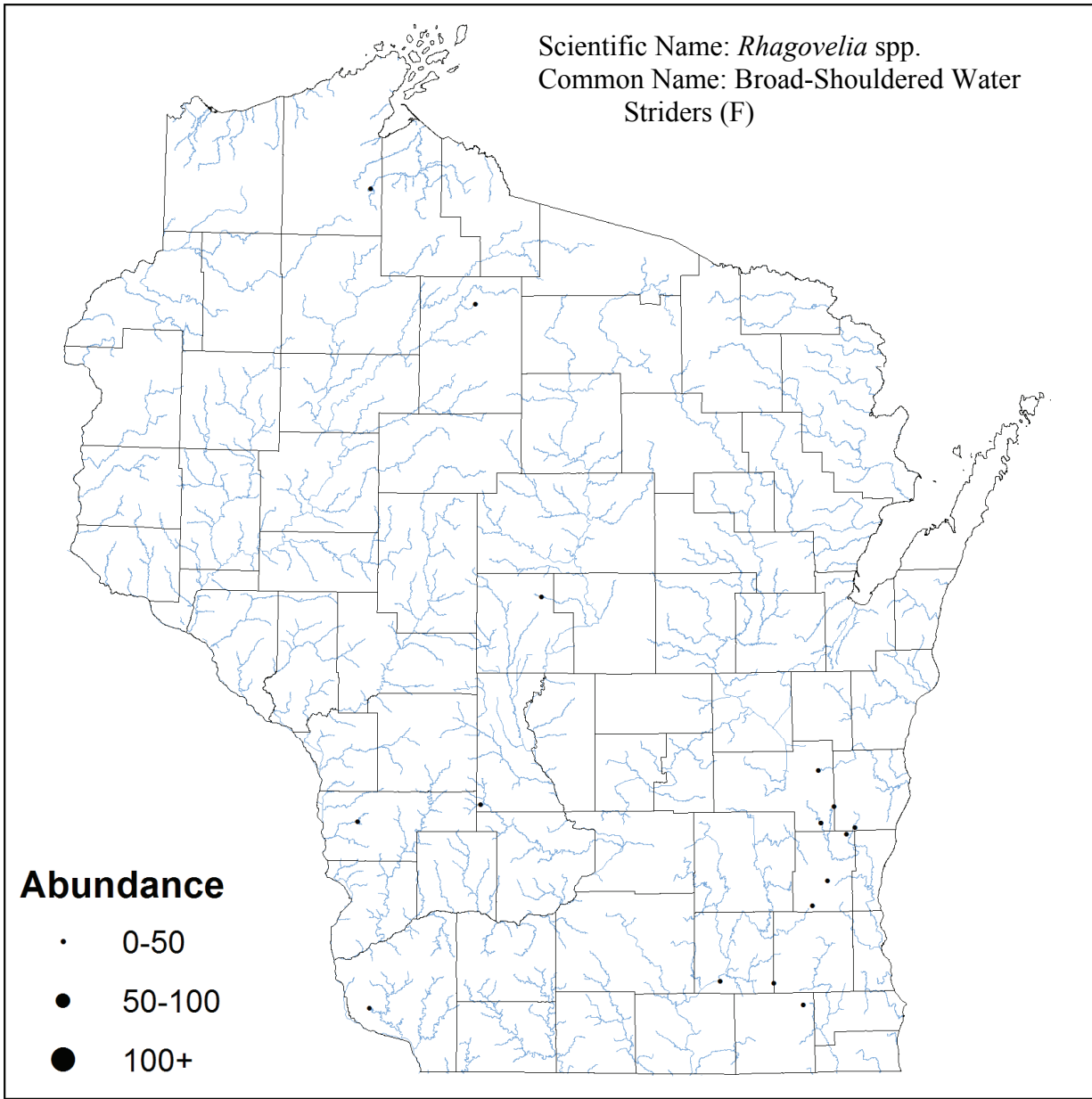
# Hemiptera Saldidae



# Hemiptera Velidae



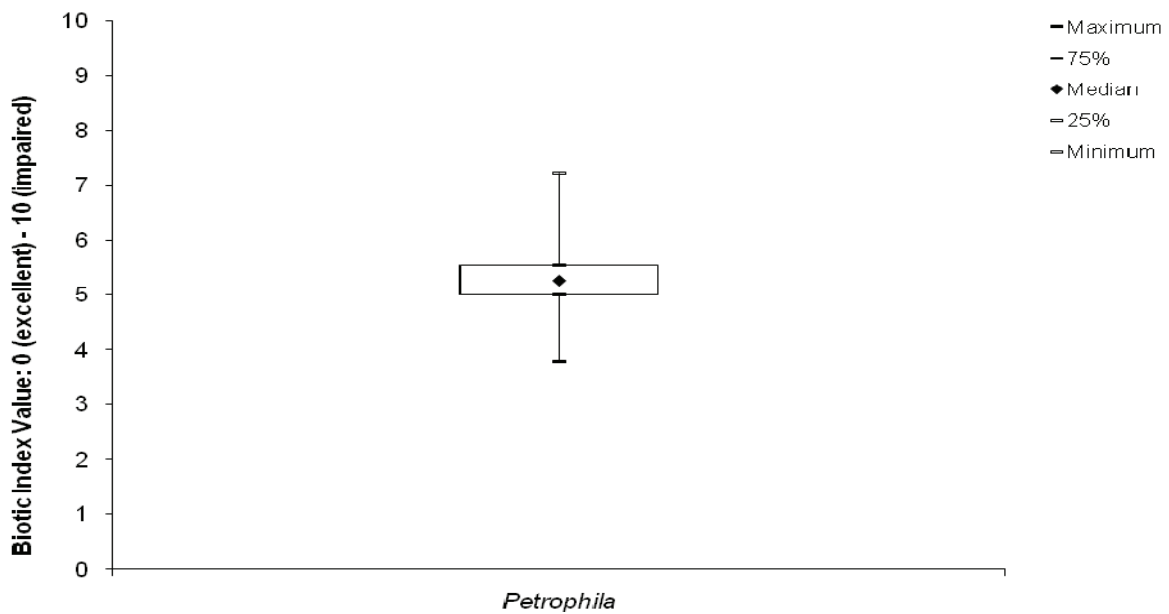
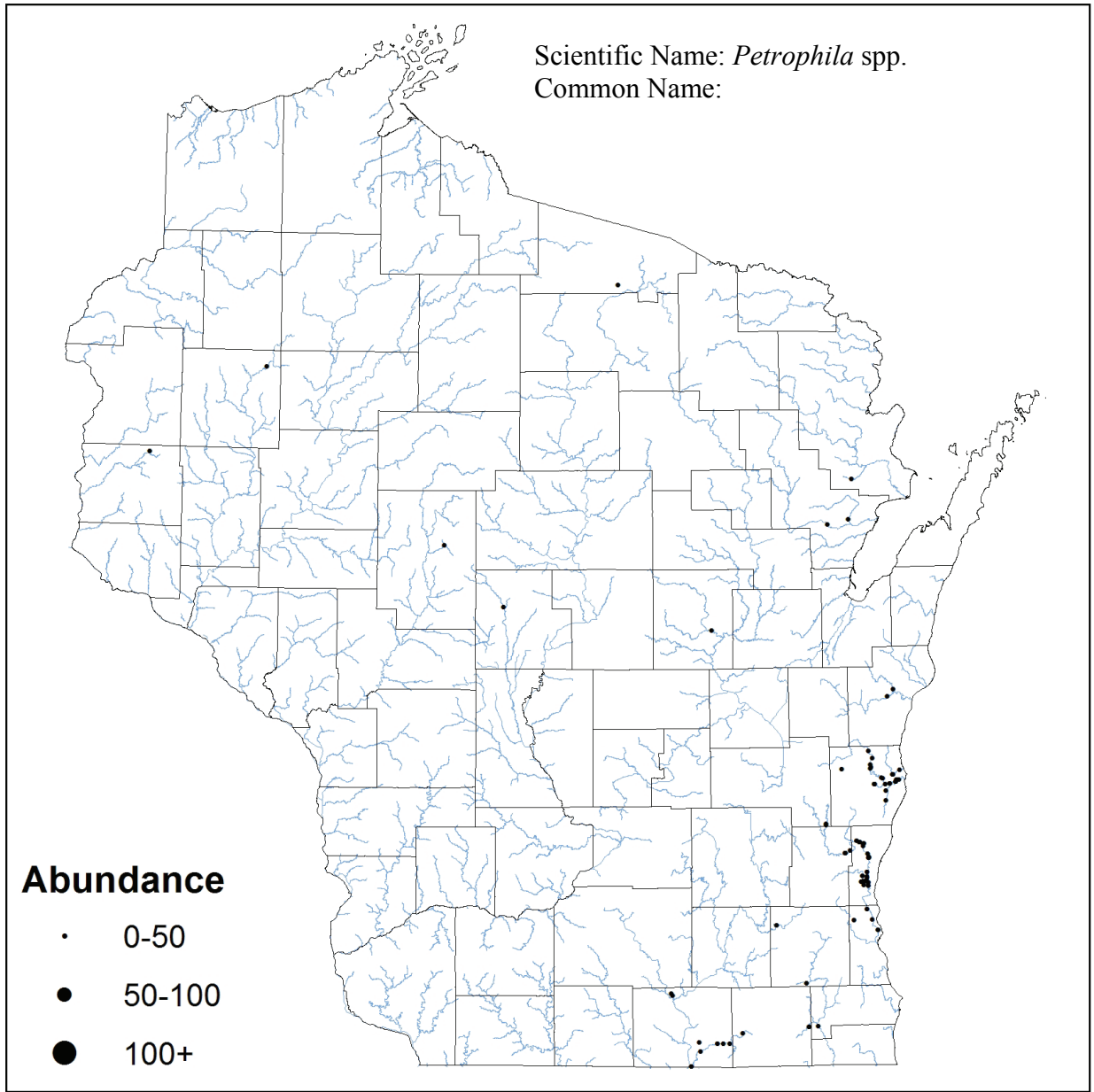






## Section IIX: Lepidoptera (Aquatic Catapillars)

# Lepidoptera Crambidae



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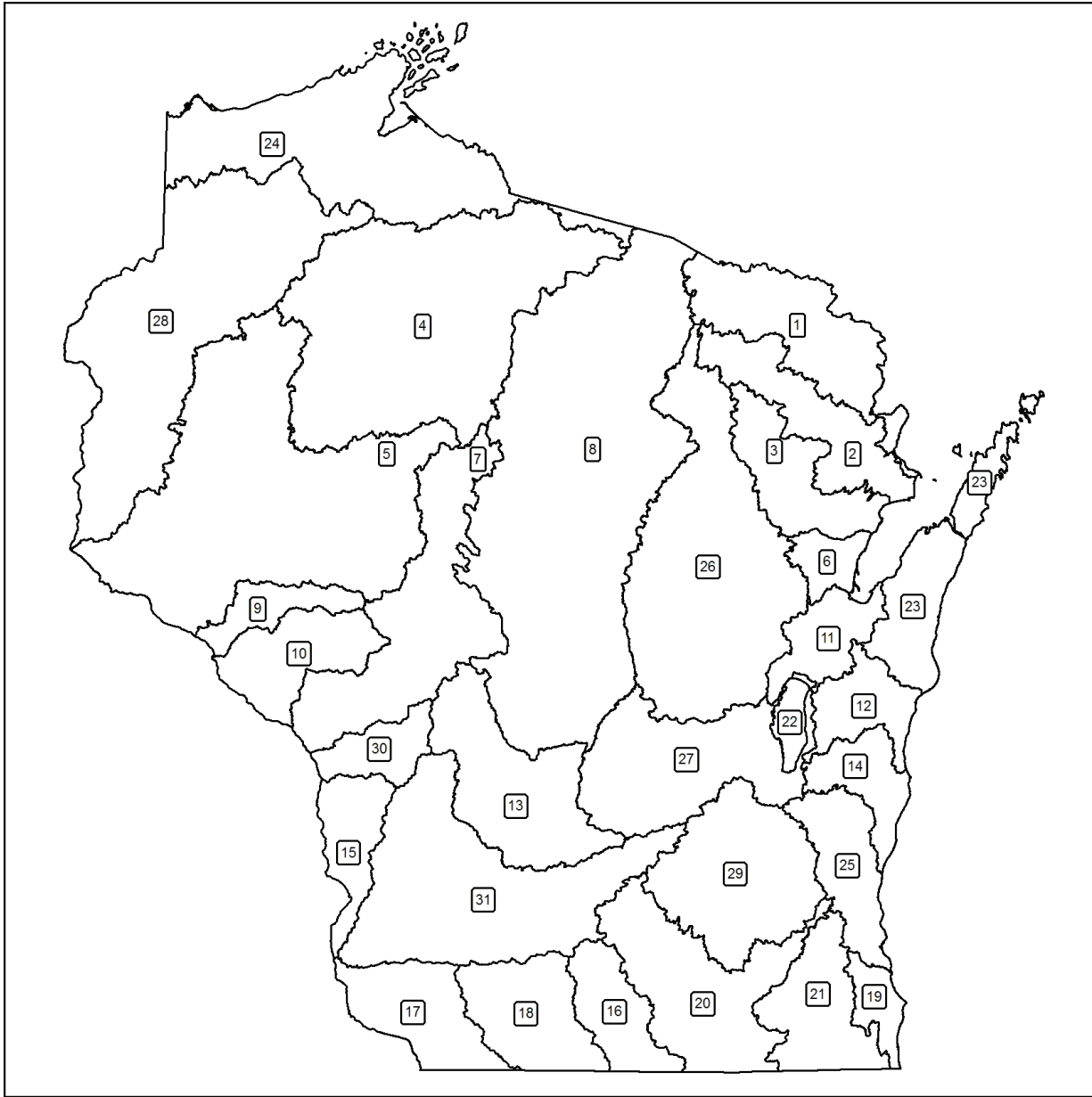
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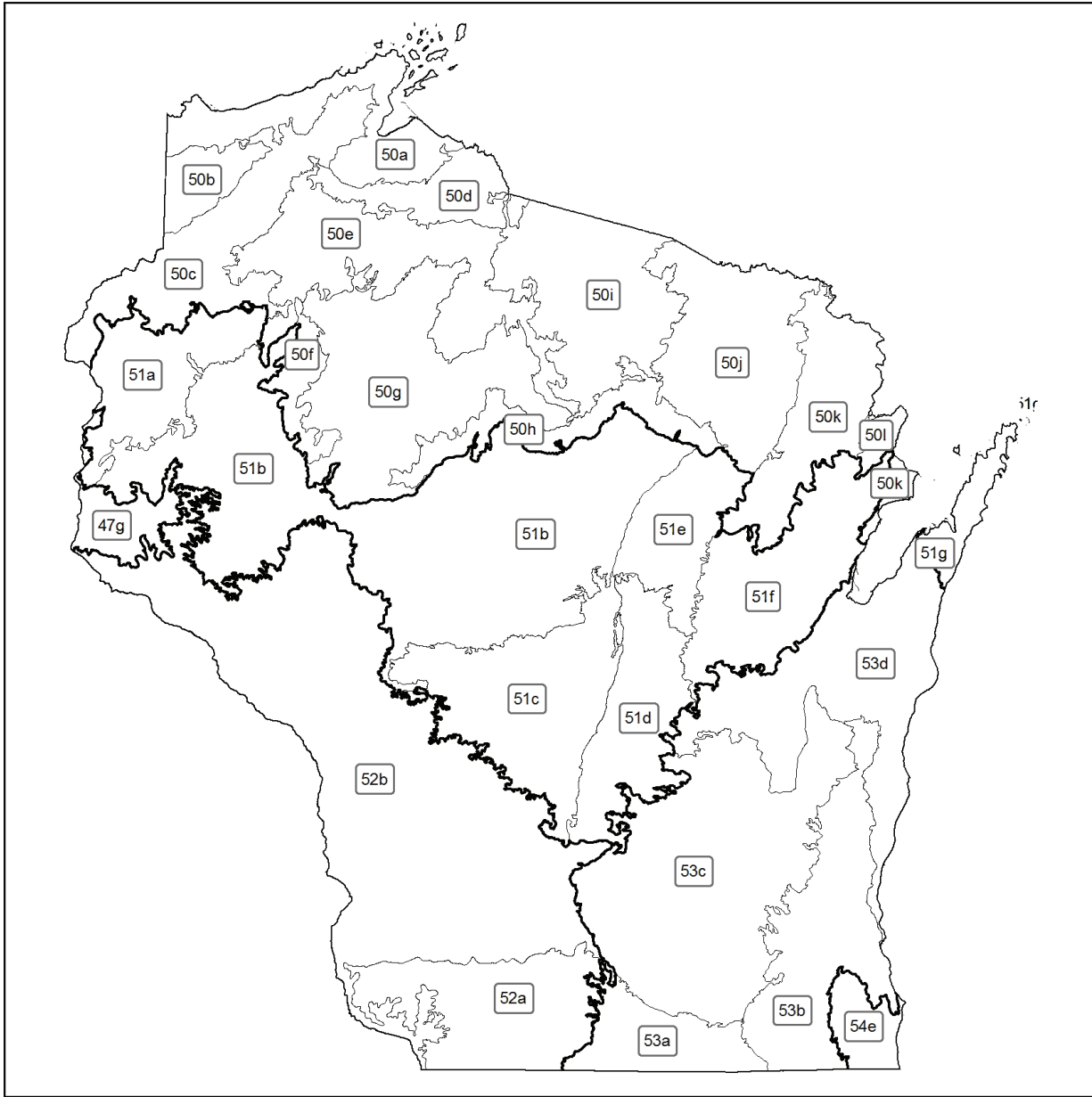


## Appendix A: Base Maps for Transparent Overlays



**Figure 3 - River Systems of Wisconsin (WDNR, 2007)**

- |    |                       |    |                 |
|----|-----------------------|----|-----------------|
| 1  | Pine                  | 17 | Grant - Platte  |
| 2  | Peshtigo              | 18 | Pecatonica      |
| 3  | Oconto                | 19 | Root - Pike     |
| 4  | Upper Chippewa        | 20 | Lower Rock      |
| 5  | Lower Chippewa        | 21 | Illinois Fox    |
| 6  | Suamico               | 22 | Lake Winnebago  |
| 7  | Black                 | 23 | Kewaunee        |
| 8  | Upper Wisconsin       | 24 | Lake Superior   |
| 9  | Buffalo               | 25 | Milwaukee       |
| 10 | Trempealeau           | 26 | Wolf            |
| 11 | Lower Fox             | 27 | Upper Fox       |
| 12 | Manitowoc             | 28 | St. Croix       |
| 13 | Baraboo - Wisconsin   | 29 | Upper Rock      |
| 14 | Sheboygan             | 30 | LaCrosse        |
| 15 | Bad Axe - Mississippi | 31 | Lower Wisconsin |
| 16 | Sugar                 |    |                 |



**Figure 4: Ecoregions of Wisconsin (Omernik, 1998)**

- |  |   |
|--|---|
| <p><b>47 Western Corn Belt Region</b><br/>           47g Prairie Pothole Region</p> <p><b>50 Northern Lakes and Forests</b><br/>           50a Lake Superior Clay Plain<br/>           50b Minnesota/Wisconsin Upland Till Plain<br/>           50c St. Croix Pine Barrens<br/>           50d Ontonagon Lobe Moraines and Gogebic Iron Range<br/>           50e Chequamegon Moraine and Outwash Plain<br/>           50f Blue Hills<br/>           50g Chippewa Lobe Rocky Ground Moraines<br/>           50h Perkinstown End Moraine<br/>           50i Northern Highlands Lakes Country<br/>           50j Brule and Paint River Drumlins<br/>           50k Wisconsin/Michigan Pine and Oak Barrens<br/>           50l Menominee Ground Moraine</p> | <p><b>51 North Central Hardwood Forests</b><br/>           51a St. Croix Stagnation Moraines<br/>           51b Central Wisconsin Undulating Till Plain<br/>           51c Glacial Lake Wisconsin Sand Plain<br/>           51d Central Sand Ridges<br/>           51e Upper Wolf River Stagnation Moraine<br/>           51f Green Bay Till and Lacustrine Plain<br/>           51g Door Peninsula</p> <p><b>52 Driftless Area</b><br/>           52a Savanna Section<br/>           52b Coulee Section</p> <p><b>53 Southeastern Wisconsin Till Plains</b><br/>           53a Rock River Drift Plain<br/>           53b Kettle Moraines<br/>           53c Southeastern Wisconsin Savannah and Till Plain<br/>           53d Lake Michigan Lacustrine Clay Plain</p> <p><b>54 Central Corn Belt Plains</b><br/>           54e Chippewa Prairie Region</p> |
|--|---|

