

A Checklist of the Aquatic Invertebrates of the Delaware River Basin, 1990-2000

By Michael D. Bilger, Karen Riva-Murray, and Gretchen L. Wall

Data Series 116

**U.S. Department of the Interior
U.S. Geological Survey**

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
Charles G. Groat, Director

U.S. Geological Survey, Reston, Virginia: 2005

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Suggested citation:

Bilger, M.D., Riva-Murray, Karen, and Wall, G.L., 2005, A checklist of the aquatic invertebrates of the Delaware River Basin, 1990-2000: U.S. Geological Survey Data Series 116, 29 p.

FOREWORD

The U.S. Geological Survey (USGS) is committed to providing the Nation with accurate and timely scientific information that helps enhance and protect the overall quality of life and that facilitates effective management of water, biological, energy, and mineral resources (<http://www.usgs.gov/>). Information on the quality of the Nation's water resources is critical to assuring the long-term availability of water that is safe for drinking and recreation and suitable for industry, irrigation, and habitat for fish and wildlife. Population growth and increasing demands for multiple water uses make water availability, now measured in terms of quantity *and* quality, even more essential to the long-term sustainability of our communities and ecosystems.

The USGS implemented the National Water-Quality Assessment (NAWQA) Program in 1991 to support national, regional, and local information needs and decisions related to water-quality management and policy (<http://water.usgs.gov/nawqa/>). Shaped by and coordinated with ongoing efforts of other Federal, State, and local agencies, the NAWQA Program is designed to answer: What is the condition of our Nation's streams and ground water? How are the conditions changing over time? How do natural features and human activities affect the quality of streams and ground water, and where are those effects most pronounced? By combining information on water chemistry, physical characteristics, stream habitat, and aquatic life, the NAWQA Program aims to provide science-based insights for current and emerging water issues and priorities.

From 1991-2001, the NAWQA Program completed interdisciplinary assessments in 51 of the Nation's major river basins and aquifer systems, referred to as Study Units (<http://water.usgs.gov/nawqa/studyu.html>). Baseline conditions were established for comparison to future assessments, and long-term monitoring was initiated in many of the basins. During the next decade, 42 of the 51 Study Units will be reassessed so that 10 years of comparable monitoring data will be available to determine trends at many of the Nation's streams and aquifers. The next 10 years of study also will fill in critical gaps in characterizing water-quality conditions, enhance understanding of factors that affect water quality, and establish links between *sources* of contaminants, the *transport* of those contaminants through the hydrologic system, and the potential *effects* of contaminants on humans and aquatic ecosystems.

The USGS aims to disseminate credible, timely, and relevant science information to inform practical and effective water-resource management and strategies that protect and restore water quality. We hope this NAWQA publication will provide you with insights and information to meet your needs, and will foster increased citizen awareness and involvement in the protection and restoration of our Nation's waters.

The USGS recognizes that a national assessment by a single program cannot address all water-resource issues of interest. External coordination at all levels is critical for a fully integrated understanding of watersheds and for cost-effective management, regulation, and conservation of our Nation's water resources. The NAWQA Program, therefore, depends on advice and information from other agencies—Federal, State, interstate, Tribal, and local—as well as nongovernmental organizations, industry, academia, and other stakeholder groups. Your assistance and suggestions are greatly appreciated.

Robert M. Hirsch
Associate Director for Water

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Conversion Factors and Datum

Multiply	By	To obtain
Area		
square kilometer (km ²)	0.3861	square mile (mi ²)

A Checklist of the Aquatic Invertebrates of the Delaware River Basin, 1990-2000

By Michael D. Bilger, Karen Riva-Murray, and Gretchen L. Wall

Abstract

This paper details a compilation of aquatic-invertebrate taxa collected at 1,080 sites as part of 13 surface-water-quality studies completed by selected Federal, state, and local environmental agencies during 1990-2000, within the 32,893-km² area of the Delaware River Basin. This checklist is intended to be a "working list" of aquatic invertebrates that can be applied successfully to the calculation and interpretation of various biological estimators to determine the status of water quality and can be used as a foundation to document the current state of biodiversity. It is not intended as a comprehensive historical inventory of the literature or of private and public holdings. A total of 11 phyla comprising 20 classes, 46 orders, 196 families, 685 genera, and 835 species were recorded.

Introduction

Since the acceptance of the Saprobien system of Kolkwitz and Marsson (1908; 1909), the work of pioneering benthic scientists such as H.B. Noel Hynes (1960; 1970), and later researchers like Plafkin and others (1989), it was recognized that benthic-invertebrate assemblages were measurable indicators of localized conditions because of their complex life cycles of a year or more, their mostly sedentary nature, and their ability to react in a predictable way to human influences on aquatic ecosystems. These earlier efforts to document water-quality effects dealt mostly with organic pollutants. As the science has progressed, benthic assessments have evolved into multi-disciplined approaches that remain faunistic but also include habitat and geomorphic analyses of lotic systems. Newer efforts are concerned with understanding the native fauna and managing waters for maximized biological quality, including taking corrective action when monitoring indicates trouble (Cairns and Pratt, 1993). Barbour and others (1999) contains both multi-metric and multivariate statistical methods for determining ecosystem effects on benthic-invertebrate communities. Accurate regional taxa lists and their accompanying pollution tolerance values are important to these assessments and interpretations and will gain increasing importance in the establishment of nar-

rative or numeric regulatory values for biologically based criteria (U.S. Environmental Protection Agency, 1994).

After the works of E.O. Wilson (1984; 1988; 2000), the subject of biodiversity has been identified to represent the basic fabric of life. Because biodiversity is in a rapidly diminishing phase, it is increasingly difficult to provide a full accountability of what sorts of organisms were present before human influences eliminated them. Even within the fauna of North America, it is estimated that less than 50 percent of the arthropod biodiversity has been described (Kosztarab and Schaefer, 1990; Rawlins and Bier, 1998). Taxonomic studies can record and describe new taxa, determine the phylogenetic relation and taxonomic status of various taxa, provide a sound classification, and produce taxonomic keys and other tools to aid in accurate identification (K.C. Kim, State College, Pa., unpubl. data, 2001). Lists of taxa within the Delaware River Basin, as presented in this paper, will aid in the baseline effort to explain the status of the aquatic-invertebrate biodiversity even at the inconsistent level of taxonomic identification and assessment.

Description of the Basin

The non-tidal Delaware River Basin encompasses more than 32,893 km² (fig. 1) and includes parts of the States of Pennsylvania, (16,744 km²), New Jersey (7,690 km²), New York (6,120 km²), and Delaware (2,507 km²) (Fischer, 2004). The headwaters of the Delaware River begin in the Catskill Mountains in the northern part of the basin. The river becomes tidally influenced in the area of Trenton, N.J., and is saline just south of Philadelphia, Pa. Two major tributaries of the Delaware River are the Lehigh (4,903 km²) and Schuylkill Rivers (3,520 km²). There are also a number of large reservoirs within the basin, including three operated by the City of New York for water supply and other uses.

The Delaware River Basin covers parts of eight ecoregions (Omernick, 1987; U.S. Environmental Protection Agency, 1999): the Northeastern Highlands, Northern Appalachian Plateau and Uplands, North Central Appalachians, Middle Atlantic Coastal Plain, Northern Piedmont, Southeastern Plains, Ridge and Valley, and Atlantic Coastal Pine Barrens. A wide range of

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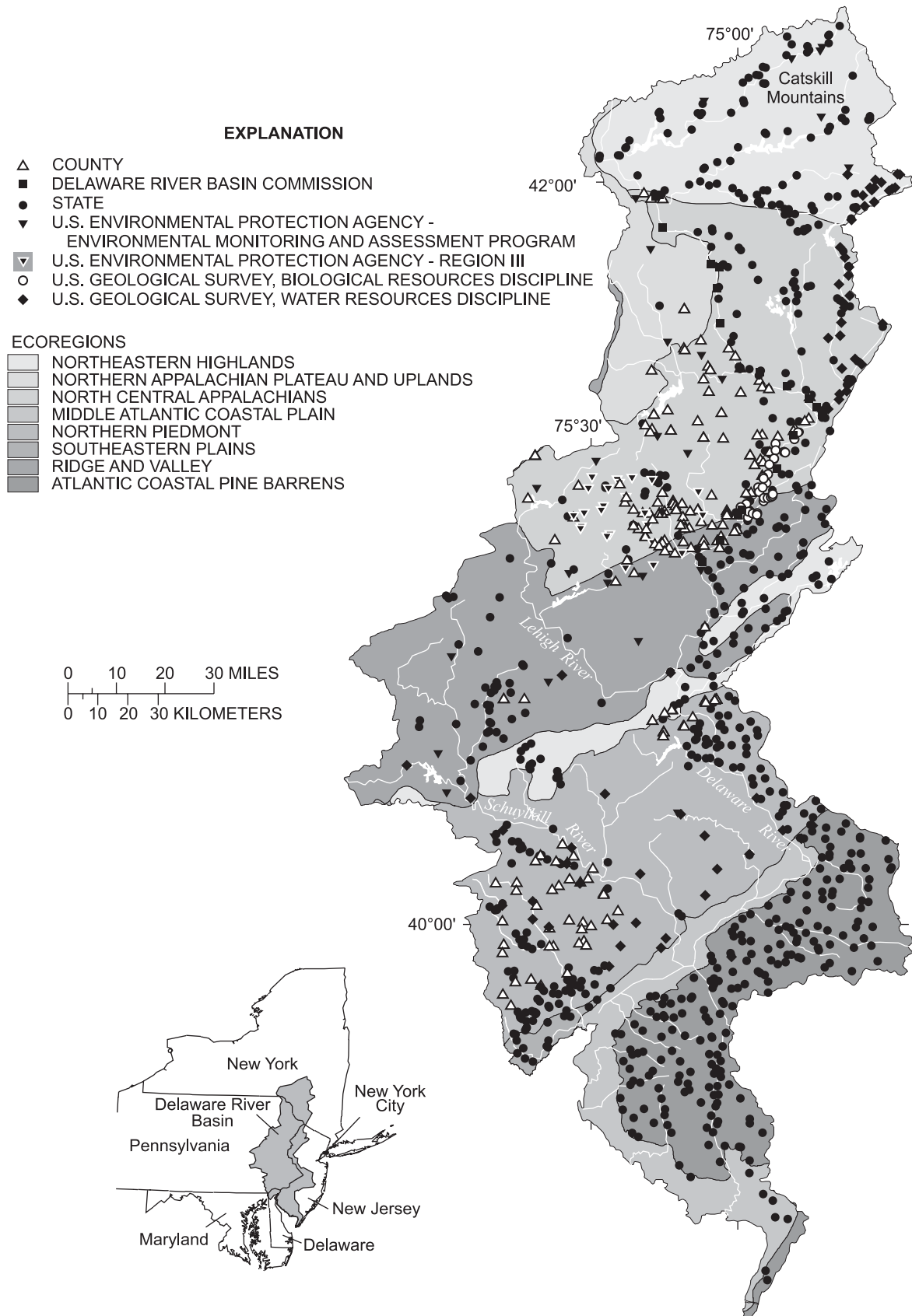


Figure 1. Ecoregions and locations and types of sampling sites within the Delaware River Basin.

topography describes the basin from nearly flat in the coastal area, to rolling hills and broad uplands, to ridges and valleys, to glaciated plateaus. Altitude varies from sea level in the south to more than 1,000 meters in the north. According to 1992 land-use data, about 60 percent of the basin is forested, 24 percent agricultural, 9 percent urban, and 7 percent surface-water bodies and other miscellaneous uses (Vogelmann and others, 1998). Most of the population and urban land use is along the Delaware Estuary. Although the population within the basin has not increased significantly over the past 20 years, there has been a pattern of intense “urban flight” from the larger cities, creating an expansive suburbia.

Methods

Data were collected and compiled from Federal, state, and local environmental agencies active within the boundaries of the Delaware River Basin as defined by the U.S. Geological Survey (table 1). These agencies were selected on the basis of their common biomonitoring approach to document conditions and changes in surface-water quality from lotic habitats by using benthic-invertebrate community measures over roughly the past decade. Field-collection techniques were not standardized; only those data resulting from laboratory identifications were included (field-identified results from the Pennsylvania Department of Environmental Protection Unassessed Waters Program were not used). Historical records from extensive literature reviews and the examination of public and private specimen holdings were considered beyond the scope of this paper, as were data from distributional surveys of particular macroinvertebrate groups. It is hoped that this checklist be expanded in scope as a future endeavor and combined with other existing taxa lists such as those for Trichoptera (Masteller and others, 2004; Masteller and Flint, 1992), Plecoptera (Masteller and others, 2004; J. Earle, Harrisburg, Pa., unpub. data, 2003), Ephemeroptera (G. Hoover, State College, Pa., unpub. data, 2003), Simuliidae (Adler and Kim, 1986; D. Rebuck, Harrisburg, Pa., unpub. data, 2003), freshwater mussels (Strayer and Jirka, 1997; Lellis, 2001), Culicidae (M. Hutchinson, Harrisburg, Pa., unpub. data, 2003), Tabanidae (F. Fees, State College, Pa., unpub. data, 2003), Odonata (Donnelly, 2004a, 2004b, 2004c; C. Schiffer, State College, Pa., unpub. data, 2003), Tipulidae (Young and Gelhaus, 2000), Amphipoda and Isopoda (D. Glazier, Huntingdon, Pa., unpub. data, 2003) and crayfish (T. Nuttall, Lock Haven, Pa., unpub. data, 2003).

The phylogenetic schemes employed in the checklist mostly followed those of Smith (2001) and Thorp and Covich (2001) for the non-insect arthropods and Merritt and Cummins (1996) for the insects. Some groups such as the annelids (Kathman and Brinkhurst, 1998; Wetzel, 2001), water mites (Smith, 2001; Smith and Cook, 1991), mayflies (McCafferty, 2000), stoneflies (Stewart and Stark, 2002), caddisflies (Wiggins, 1995), beetles (Epler, 1996) and midges (Epler, 1995, 2001; R. Bode, New York Department of Environmental Conserva-

tion, Albany, N.Y., written commun., 2001) required additional research to document the most current phylogeny. Although the senior author has extensively collected aquatic invertebrates within the Delaware River Basin, it was not possible to confirm all identifications of animals comprising the list. All taxa were reviewed for distributional accuracy (several taxa remain unresolved) and amended as necessary for synonymy and to correct “outdated taxonomy.” Any weaknesses within certain groups in the checklist likely resulted from the perceived difficulty in conducting identifications, especially for the oligochaetes, mollusks, chironomids, and several minor phyla.

Aquatic Invertebrates of the Delaware River Basin

The compilation of a Delaware River Basin aquatic-invertebrate checklist incorporating multiple agency data (three county, four state, and four Federal) at 1,080 sites presented a challenge. Although these agencies have biomonitoring as a common goal, there was much latitude in the sampling designs, methods and seasons of collection, sample-site density, and levels of taxonomic resolution. Because this is a “working list” of taxa, the authors decided not to include data collected outside the 13 studies; however, the works of active taxonomists are mentioned in the methods section and their works will aid greatly in the assemblage of a comprehensive list of Delaware River Basin aquatic invertebrates.

At the end of 2000, the checklist consisted of 11 phyla comprising 20 classes, 46 orders, 196 families, 685 genera, and 835 species (table 2). An examination of the checklist revealed a number of interesting points. The arthropods made up about 83 percent of the total genera listed, and 95 percent of those were insects. Thirty percent of the total genera were dipterans; 62 percent of those were chironomids, which themselves made up 18 percent of the total genera. The mayflies, stoneflies, and caddisflies, prominent animals in biomonitoring assessments, collectively made up 24 percent of the total genera listed. Twenty-eight genera were listed as collected in at least 10 of the 13 studies and 10 genera were collected in 12 studies—*Baetis*, *Isonychia*, *Stenonema*, *Sialis*, *Glossosoma*, *Polycentropus*, *Cheumatopsyche*, *Lepidostoma*, *Antocha*, and *Tipula*.

Assessments of the status of the Delaware River Basin invertebrate assemblage are difficult to interpret at this time. As the diversity is better defined and other basins like the Susquehanna River are documented for comparison, a more complete understanding of how large rivers function in their benthic ecology will evolve. For now, it is hoped this updated taxa checklist will provide a consistent basis for current and future regional synthesis or comparison of biomonitoring data.

Table 1. Agencies and programs from which benthic-invertebrate data were obtained for checklist of taxa in the Delaware River Basin.

[Number of sites sampled, and years during which sampling was conducted, pertain only to those data used in this report. DNREC, Delaware Department of Natural Resources and Environmental Control; STORET, U.S. Environmental Protection Agency Storage and Retrieval System; NJDEP, New Jersey Department of Environmental Protection; NYSDEC, New York State Department of Environmental Conservation; PaDEP, Pennsylvania Department of Environmental Protection; USGS, U.S. Geological Survey]

Agency and program(s)	Sites	Year(s)	Reference(s)	
			Data source	Other references
Chester County Water Resources Authority Stream Conditions of Chester County Program	39	1990-2000	Reif, 1999; 2000; written commun., 2001	—
Delaware Department of Natural Resources and Environmental Control Macroinvertebrate Survey	52	1993	John Maxted, DNREC, written commun., 1998	—
Delaware River Basin Commission Scenic Rivers Monitoring Program	19	1990-92	STORET	—
Monroe County Planning Commission Water Quality Studies	92	1990-2000	Monroe County Planning Commission, 1990-2000	—
New Jersey Department of Environmental Protection Ambient Biomonitoring Network	328	1990-2000	John Kurtz, NJDEP, written commun., 1995; 1996; 2001	Kennen, 1999; Kurtenbach, 1991; NJDEP, 1994a, 1994b, 1996, 1999a, 1999b
New York State Department of Environmental Conservation Rotating Intensive Basins Study Program	156	1993-2000	Margaret Novak, NYSDEC, written commun., 1998, 2001	Bode and others, 1993a, 1993b, 1995a, 1995b, 1995c, 2004; NYSDEC, 1996
Pennsylvania Department of Environmental Protection Surface Water Quality Monitoring Network	33	1991-96	Rodney Kime, PaDEP, written commun., 1998	Shertzer and Schreffler, 1996
Anti-Degradation Program	150	1990, 1992-97	Rodney Kime, PaDEP, written commun., 1998	—
Pike County Conservation District Surface Water Quality Monitoring Program	44	1991-2000	Pike County Conservation District, 1991-2000	—
U.S. Environmental Protection Agency Environmental Monitoring and Assessment Program Region 3	32 25	1993-96 1994-96	U.S. Environmental Protection Agency, 2000 Passmore and Green, 1997	Klemm and Lazorchak, 1994
U.S. Geological Survey, Biological Resources Discipline Hemlock/ Hardwood Study	28	1997	Snyder and others, 1999	—
U.S. Geological Survey, Water Resources Discipline National Water-Quality Assessment Program	35	1999-2000	unpublished data	Fischer, 2004
Neversink Watersheds Studies	21	1991-92, 1995-99	Barry Baldigo, USGS, written commun., 1999	Lawrence and others, 1994
Other New York District Studies	26	1997	Barry Baldigo, USGS, written commun., 1999	—

Acknowledgments

This checklist could not have been completed without the help of the biologists from the selected agencies, Robert W. Bode (colleague reviewer) and Margaret A. Novak and Larry E. Abele from the New York State Department of Environmental Conservation, Albany, N.Y.; Rodney Kime from the Pennsylvania Department of Environmental Protection, Harrisburg, Pa.; Robert M. Ross from the U.S. Geological Survey, Biological Resources Discipline, Wellsboro, Pa.; Andrew G. Reif from the U.S. Geological Survey, Water Resources Discipline, Malvern, Pa.; Barry P. Baldigo from the U.S. Geological Survey, Water Resources Discipline, Troy, N.Y.; Allison R. Brigham, U.S. Geological Survey, Denver, Colo.; Eric Bartolacci from the Monroe County Planning Commission, Stroudsburg, Pa.; Sally Jones and Hannelore Schanzenbacher from the Pike County Conservation District, Hawley, Pa.; John R. Maxted from the Auckland Regional Council, Auckland, New Zealand, formerly of the Delaware Department of Natural Resources and Environmental Control, Dover, Del.; Edward D. Santoro and

Robert L. Limbeck from the Delaware River Basin Commission, Trenton, N.J.; Richard Evans from the National Park Service, Milford, Pa.; Al Korndoerfer and John Kurtz from the New Jersey Department of Environmental Protection, Trenton, N.J.; Ellyn Del Corso Campbell currently with Gannett Fleming, Camp Hill, Pa.; and Jim Green (retired) and Margaret Passmore from the U.S. Environmental Protection Agency, Wheeling, W.Va.

The authors especially thank Jonathan G. Kennen from the U.S. Geological Survey, Water Resources Discipline, Trenton, N.J., who served as a colleague reviewer and technical and taxonomic expert; Robin A. Brightbill, U.S. Geological Survey, Water Resources Discipline, New Cumberland, Pa., for data analysis, organization, and guidance; J. Kent Crawford, U.S. Geological Survey, New Cumberland, Pa., for editorial review; and Jeffrey M. Fischer, U.S. Geological Survey, Water Resources Discipline, Trenton, N.J., who served as Project Chief of the Delaware River Basin NAWQA Project for his support.

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Table 2. Checklist of the aquatic invertebrates of the Delaware River Basin, 1990-2000.

[Agency codes: C1, Chester County Water Resources Authority; C2, Monroe County Planning Commission; C3, Pike County Conservation District; F1, U.S. Environmental Protection Agency (USEPA), EMAP program; F2, USEPA Region 3; F3, Delaware River Basin Commission; F4, U.S. Geological Survey (USGS) Biological Resources Discipline; F5, USGS Water Resources Discipline (WRD) National Water-Quality Assessment Program; F6, USGS WRD, New York District; S1, Delaware Department of Natural Resources and Environmental Control; S2, New Jersey Department of Environmental Protection; S3, New York State Department of Environmental Conservation; S4, Pennsylvania Department of Environmental Protection]

Taxonomic name	Agency code
PORIFERA	F5
DEMOSPONGIAE	
HAPLOSCLERIDA	
Spongillidae	
<i>Anheteromeyenia argyrosperma</i>	S2
<i>Ephydatia fluviatilis</i>	S2
<i>Eunapius fragilis</i>	S2
<i>Eunapius ingloviformis</i>	S2
<i>Heteromeyenia</i>	S2
<i>Heteromeyenia latitenta</i>	S2
<i>Heteromeyenia tubisperma</i>	S2
<i>Spongilla</i>	S2
<i>Spongilla lacustris</i>	S2
<i>Trochospongilla</i>	S2
CNIDARIA	F6
HYDROZOA	
HYDROIDA	
Clavidae	
<i>Cordylophora lacustris</i>	S2
Hydridae	
<i>Hydra</i>	C1,F5,S2
PLATYHELMINTHES	S2
TURBELLARIA	F1,F2,F5,F6,S2,S4
MACROSTOMIDA	
Macrostomidae	
<i>Macrostomum</i>	C3
PRORHYNCHIDA	
Prorhynchidae	
<i>Geocentrophora baltica</i>	S2
PROSERIATA	
Plagiostomidae	
<i>Hydrolimax</i>	S2
<i>Hydrolimax grisea</i>	S2
TRICLADIDA	S3
Dendrocoelidae	
<i>Procotyla</i>	S2

Taxonomic name	Agency code
<i>Procotyla fluviatilis</i>	S2
Dugesiidae	
<i>Cura</i>	S4
<i>Cura foremanii</i>	S1,S2
<i>Dugesia</i>	S2,S4
<i>Dugesia tigrina</i>	S2
Planariidae	C1,S4
<i>Hymenella retenuova</i>	S2
<i>Phagocata</i>	S2
<i>Phagocata gracilis</i>	S2
<i>Phagocata morgani morgani</i>	F1,S2
<i>Phagocata velata</i>	S2
<i>Phagocata woodworthi</i>	S2
<i>Planaria</i>	C2,S4
NEMERTEA	C1,S2,S4
ENOPLA	
HOPLONEMERTEA	
Tetrastemmatidae	
<i>Prostoma</i>	C1,F5,S2
<i>Prostoma graecense</i>	S2,S3
NEMATODA	C1,C2,F1,F5,F6,S2,S4
NEMATOMORPHA	C2,F3
GORDIOIDEA	
GORDIOIDA	
Gordiidae	
<i>Gordius</i>	S4
ECTOPROCTA	F5
GYMNOLAEMATA	
CTENOSTOMATA	
Paludicellidae	
<i>Paludicella</i>	S2
<i>Paludicella articulata</i>	S2
PHYLACTOLAEMATA	
PLUMATELLIDA	
Fredericellidae	
<i>Fredericella</i>	S2
<i>Fredericella sultana</i>	S2
Pectinatellidae	
<i>Pectinatella magnifica</i>	S2
Plumatellidae	
<i>Hyalinella punctata</i>	S2
<i>Plumatella casmiana</i>	S2
<i>Plumatella fruticosa</i>	S2
<i>Plumatella repens</i>	S2
ANNELIDA	C2,F3,S4
POLYCHAETA	C1
SABELLIDA	
Sabellidae	C1

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Manayunkia speciosa</i>	F5,S2,S3,S4	<i>Pristina leidy</i>	S2,S3
APHANONEURA		<i>Pristina osborni</i>	S2
AELOSOMATIDA		<i>Slavina</i>	S2
Aeolosomatidae	S1	<i>Slavina appendiculata</i>	S2,S3
<i>Aeolosoma</i>	F6,S2	<i>Specaria josinae</i>	F1,S2
BRANCHIOBDELLAE		<i>Stylaria</i>	C1,S2,S4
BRANCHIOBDELLIDA	F1,F6	<i>Stylaria lacustris</i>	S1,S2,S3
Branchiobdellidae	F1,S3	<i>Vejdovskyella comata</i>	S2
<i>Xironogiton</i>	S4	Tubificidae	C1,F1,F5,S1,S2,S4
OLIGOCHAETA	C1,C2,C3,F1,F2,F3,F6, S4	Undet. Tubificidae w/capilli- form setae	F1
LUMBRICULIDA	S4	Undet. Tubificidae w/o capilli- form setae	F1,S3
Lumbriculidae	C1,C2,C3,F1,F5,S1,S2, S3,S4	<i>Aulodrilus</i>	S1,S2
<i>Eclipdrilus</i>	F1,S2	<i>Aulodrilus limnobius</i>	F1
<i>Lumbriculus</i>	C1,C2,F1,S2	<i>Aulodrilus pigueti</i>	S2
<i>Lumbriculus variegatus</i>	F1,F4,S1,S2	<i>Aulodrilus pluriseta</i>	F1,S2
<i>Styldrilus heringianus</i>	C3,F1,S2,S3	<i>Bothrioneurum vej dovskyanum</i>	F1
HAPLOTAXIDA		<i>Branchiura sowerbyi</i>	S2
Haplotaxidae		<i>Limnodrilus</i>	F1,S2
<i>Haplotaxis</i>	S2	<i>Limnodrilus claparedianus</i>	F1,S2
<i>Haplotaxis gordioides</i>	S2	<i>Limnodrilus hoffmeisteri</i>	F1,S2,S3
TUBIFICIDA		<i>Limnodrilus udekemianus</i>	S2
Enchytraeidae	F1,F4,F5,S1,S2,S3	<i>Monopylephorus helobius</i>	S2
<i>Lumbricillus</i>	S2	<i>Quistradrilus multisetosus</i>	S2,S3
Naididae	C1,F5,S2,S4	<i>Rhyacodrilus</i>	S2
<i>Arcteonais</i>	S2	<i>Spirosperma</i>	F1,S1,S2
<i>Arcteonais lomondi</i>	S2	<i>Spirosperma beetoni</i>	S2
<i>Chaetogaster</i>	S2	<i>Spirosperma ferox</i>	F1,S2,S3
<i>Chaetogaster diaphanus</i>	F1,S2,S3	<i>Spirosperma nikolskyi</i>	F4,S2
<i>Chaetogaster diastrophus</i>	S2	<i>Telmatodrilus</i>	S2
<i>Chaetogaster limnaei</i>	S2	<i>Telmatodrilus vej dovskyi</i>	S2
<i>Dero</i>	S1,S2,S3	<i>Tubifex</i>	C2,S2
<i>Dero flabelliger</i>	S2	<i>Tubifex tubifex</i>	S2,S3
<i>Dero furcata</i>	S2	LUMBRICINA	C2,C3,F6,S2,S3
<i>Dero nivea</i>	S2	Lumbricidae	C2,F1,F4,S2,S4
<i>Dero obtusa</i>	S2	Megascolecidae	F4,S2
<i>Nais</i>	F1,S1,S2	HIRUDINEA	C2,C3,F5,S2,S3,S4
<i>Nais behmingi</i>	F1,S2,S3	RHYNCHOBDELLIDA	F3
<i>Nais bretscheri</i>	F1,S2,S3	Glossiphoniidae	F5
<i>Nais communis</i>	F1,S2,S3	<i>Actinobdella</i>	S2
<i>Nais elinguis</i>	S2	<i>Alboglossiphonia heteroclita</i>	S2
<i>Nais pardalis</i>	F1	<i>Desserobdella phalera</i>	S2
<i>Nais pseudobtusa</i>	F1,S2	<i>Desserobdella picta</i>	S2
<i>Nais simplex</i>	F1,S2,S3	<i>Gloiodbella elongata</i>	S2
<i>Nais variabilis</i>	F1,S2,S3	<i>Glossiphonia</i>	S4
<i>Ophidonais serpentina</i>	S2,S3	<i>Glossiphonia paludosa</i>	S2
<i>Pristina</i>	S2	<i>Helobdella</i>	C1,S2
<i>Pristina foreli</i>	S2	<i>Helobdella fusca</i>	S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Helobdella stagnalis</i>	F1,S2	<i>Valvata</i>	F6,S2,S4
<i>Helobdella triserialis</i>	S2	<i>Valvata bicarinata</i>	S2
<i>Oligobdella biannulata</i>	S2	<i>Valvata piscinalis</i>	F6
<i>Placobdella</i>	S2,S4	<i>Valvata tricarinata</i>	S2
<i>Placobdella hollensis</i>	S2	Viviparidae	C1
<i>Placobdella multilineata</i>	S2	<i>Campeloma</i>	C1,C2,S2,S4
<i>Placobdella ornata</i>	S2	<i>Campeloma decisum</i>	S2
<i>Placobdella papillifera</i>	S2	<i>Cipangopaludina chinensis mal-</i>	F5
<i>Placobdella parasitica</i>	S2	<i>leata</i>	
<i>Placobdella translucens</i>	S2	<i>Viviparus georgianus</i>	S2
Piscicolidae	F3	BASOMMATOPHORA	S1
<i>Myzobdella lugubris</i>	C3,S2	Ancylidae	C2,F2,F3,F5,S4
<i>Piscicola punctata</i>	S2	<i>Ferrissia</i>	C1,C2,C3,F1,F3,F5,S1, S2,S3,S4
ARHYNCHOBDELLIDA		<i>Ferrissia parallela</i>	S2
Erpobdellidae	C1,F5,F6,S2	<i>Ferrissia rivularis</i>	F1,F6,S2,S3
<i>Dina anoculata</i>	S2	<i>Laevapex</i>	F5,S4
<i>Erpobdella</i>	C1,S4	<i>Laevapex fuscus</i>	C3,S2
<i>Erpobdella punctata</i>	S1, S2	Lymnaeidae	C2,F5,S1,S2,S3,S4
<i>Mooreobdella</i>	S2	<i>Fossaria</i>	C2,F5,S2,S4
<i>Mooreobdella fervida</i>	S2	<i>Fossaria obrussa</i>	S2
<i>Mooreobdella melanostoma</i>	S2	<i>Lymnaea</i>	C1,C2
<i>Mooreobdella microstoma</i>	S2	<i>Pseudosuccinea</i>	S1
<i>Mooreobdella tetragon</i>	S2	<i>Pseudosuccinea columella</i>	S2
Haemopidae		<i>Stagnicola</i>	F5,S2,S4
<i>Haemopsis marmorata</i>	S2	<i>Stagnicola caperata</i>	S2
MOLLUSCA		<i>Stagnicola catascopium</i>	S2
GASTROPODA	C1,C2,F3,F5,S4	Physidae	C2,F5,F6,S4
MESOGASTROPODA		Physinae	C3
Bithyniidae		<i>Aplexa elongata</i>	S2
<i>Bithynia</i>	C2,F1	<i>Physa</i>	C1,C2,C3,F3,S2,S4
<i>Bithynia tentaculata</i>	S3	<i>Physella</i>	F4,F5,S1,S2,S3,S4
Hydrobiidae	C2,F3,F5,F6,S2,S4	<i>Physella ancillaria</i>	S3
<i>Amnicola</i>	C1,S2,S4	<i>Physella gyrina</i>	S2
<i>Amnicola grana</i>	S2	<i>Physella heterostropha</i>	S2
<i>Amnicola limosa</i>	S2,S3	<i>Physella integra</i>	S2
<i>Birgella</i>	S2	<i>Physella vinosa</i>	S2
<i>Fontigens</i>	S2	Planorbidae	C1,C2,F5,S2,S3,S4
<i>Gillia</i>	S2	<i>Gyraulus</i>	C1,C2,F5,F6,S2,S4
<i>Gillia altilis</i>	S2	<i>Gyraulus circumstriatus</i>	S2,S3
<i>Hydrobia</i>	S2	<i>Gyraulus deflectus</i>	S2
<i>Paludestrema bottimeri</i>	S2	<i>Gyraulus parvus</i>	C3,F4,S2
<i>Somatogyrus</i>	S2	<i>Helisoma</i>	C1,F5,S2
Pleuroceridae	S3,S4	<i>Helisoma anceps anceps</i>	S2
<i>Elimia</i>	C1,F5,S2,S4	<i>Menetus</i>	C1,F5,S1,S2,S4
<i>Elimia virginica</i>	S2	<i>Menetus dilatatus</i>	S2
<i>Pleurocera</i>	S4	<i>Planorbella</i>	C3,F5,S2,S4
<i>Pleurocera acuta</i>	S2	<i>Planorbella campanulata</i>	C3
Valvatidae	C2,F2	<i>Planorbella trivolvis</i>	S2

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Planorbula</i>	C1,S2,S4	ARACHNIDA	
<i>Promenetus</i>	S2	ACARI	F5,F6
<i>Promenetus exacuous</i>	S2	HYDRACHNIDIA	C1,F1,F6,S4
STYLOMMATOPHORA		TROMBIDIFORMES	
Discidae		Eylaoidea	
<i>Discus cronkhitei</i>	S2	Limnocharidae	
Helicodiscidae		<i>Limnochares</i>	F1
<i>Helicodiscus parallelus</i>	S2	Hydryphantoidea	
Zonitidae		Hydryphantidae	F4
<i>Zonitoides</i>	S2	Hydrodromidae	
<i>Zonitoides arboreus</i>	S2	<i>Hydrodroma despicens</i>	S2
BIVALVIA	F1,F3,F5,F6	Lebertioidea	
UNIONOIDA		Sperchonidae	
Unionidae	C2,F5,S2	<i>Sperchon</i>	S2,S4
<i>Alasmidonta undulata</i>	S2	<i>Sperchonopsis verrucosa</i>	S2
<i>Anodonta</i>	S2	Lebertiidae	
<i>Anodonta imbecillis</i>	F5	<i>Lebertia</i>	F1,S1,S2
<i>Anodonta implicata</i>	S2	Oxidae	
<i>Elliptio</i>	F5	<i>Oxus</i>	C3
<i>Elliptio complanata</i>	F3,S2	Torrenticolidae	
<i>Pyganodon cataracta</i>	S2	<i>Torrenticola</i>	F4
VENEROIDA		Hygrobatoidea	
Corbiculidae		Limnesiidae	
<i>Corbicula</i>	F5,S2,S4	<i>Limnesia</i>	S2
<i>Corbicula fluminea</i>	F3,S1,S2	Hygrobatidae	
Sphaeriidae	C1,C2,C3,F1,F2,F5,F6, S2,S3,S4	<i>Hygrobates</i>	S2
<i>Musculium</i>	C1,C2,C3,F1,F3,F5,S1, S2,S4	Unionicolidae	
<i>Musculium partumeium</i>	S2	<i>Neumania</i>	S2
<i>Musculium securis</i>	S2	<i>Unionicola</i>	S2
<i>Musculium transversum</i>	S2	Pionidae	
<i>Pisidium</i>	C1,C2,C3,F1,F3,F5,S1, S2,S4	<i>Piona</i>	S2
<i>Pisidium casertanum</i>	F4,S2	Aturidae	
<i>Pisidium compressum</i>	S2	<i>Brachypoda</i>	S2
<i>Pisidium dubium</i>	F1,S2	Arrenuroidea	
<i>Pisidium fallax</i>	S2	Krendowskiidae	
<i>Pisidium punctatum</i>	S2	<i>Geayia ovata</i>	S2
<i>Pisidium variabile</i>	S2	Arrenuridae	
<i>Pisidium walkeri</i>	S2	<i>Arrenurus</i>	S2
<i>Sphaerium</i>	C1,C2,C3,F3,F5,S2,S3, S4	ORIBATIDA	
<i>Sphaerium fabale</i>	S2	Hydrozetidae	
<i>Sphaerium occidentale</i>	S2	<i>Hydrozetes</i>	S1,S2
<i>Sphaerium rhomboideum</i>	S2	ARTHROPODA	
<i>Sphaerium simile</i>	S2	CRUSTACEA	C2,F6
<i>Sphaerium striatinum</i>	S2	BRANCHIOPODA	
CHELICERATA		CLADOCERA	C1
		Chydoridae	
		<i>Eurycercus lamellatus</i>	S2
		Daphnidae	

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Daphnia</i>	S2	<i>Porcellionides</i>	S2
<i>Simocephalus exspinosus</i>	S2	AMPHIPODA	C2,F3,F5,S4
<i>Simocephalus vetulus</i>	S2	Crangonyctidae	S4
Macrothricidae		<i>Crangonyx</i>	C1,C3,F1,F5,S1,S2,S4
<i>Acantholeberis curvirostris</i>	S2	<i>Crangonyx pseudogracilis</i>	S2
<i>Ilyocryptus acutifrons</i>	S2	<i>Crangonyx richmondensis</i>	S2
<i>Ilyocryptus sordidus</i>	S2	<i>Crangonyx serratus</i>	S2
Sididae		<i>Crangonyx shoemakeri</i>	S2
<i>Latona setifera</i>	S2	<i>Stygonectes</i>	C3,F1,F4,S1,S2,S4
<i>Sida</i>	S2	Gammaridae	C1,C2,F1
OSTRACODA		<i>Gammarus</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
PODOCOPA	C1	<i>Gammarus fasciatus</i>	S2
Candoniidae		<i>Gammarus lacustris</i>	C3
<i>Candona</i>	S2	<i>Synurella chamberlaini</i>	S2
Cyprididae	S2	Talitridae	C2,S4
<i>Cypricercus</i>	S2	<i>Hyaella</i>	C2,C3,S2,S4
<i>Eucypris virens</i>	S2	<i>Hyaella azteca</i>	C1,C3,F5,S2
COPEPODA		DECAPODA	F5,S4
CALANOIDA		Cambaridae	C1,C2,C3,F1,F2,F4,F5, F6,S2,S3,S4
Diaptomidae		<i>Cambarus</i>	C1,C2,F5,S1,S2,S4
<i>Diaptomus</i>	S2	<i>Cambarus bartonii bartonii</i>	C3,S2
HARPACTICOIDA		<i>Orconectes</i>	C1,C2,F5,S2,S4
Canthocamptidae		<i>Orconectes limosus</i>	S2
<i>Attheyella illinoisensis</i>	S2	<i>Orconectes rusticus</i>	F1
CYCLOPOIDA	C1	<i>Procambarus</i>	C1,C2
Cyclopidae	C1	<i>Procambarus acutus acutus</i>	S2
<i>Acanthocyclops vernalis</i>	S2	Palaemonidae	
<i>Cyclops</i>	C1,C2,S2	<i>Palaemonetes</i>	S2
<i>Eucyclops</i>	S2	<i>Palaemonetes paludosus</i>	S2
<i>Macrocyclops albidus</i>	S2	INSECTA	
<i>Megacyclops viridis</i>	S2	COLLEMBOLA	C2,C3,F5,S4
<i>Orthocyclops modestus</i>	S2	Entomobryidae	S2
MALACOSTRACA		<i>Cyphoderus</i>	S2
ISOPODA	C2,F1,S4	<i>Entomobrya</i>	S2
Asellidae	C1,C2,F2,F5	<i>Tomocerus</i>	S2
<i>Caecidotea</i>	C1,C2,C3,F1,F5,F6,S1, S2,S3,S4	Hypogastruridae	
<i>Caecidotea forbesi</i>	S2	<i>Anurida</i>	S2
<i>Caecidotea nodulus</i>	S2	<i>Neanura</i>	S2
<i>Caecidotea obtusus</i>	S2	<i>Tafallia</i>	S2
<i>Caecidotea racovitzai</i>	S2, S3	<i>Xynella</i>	F4,S2
<i>Conasellus communis</i>	S2	Isotomidae	S4
<i>Lirceus</i>	C1,C2,F1,F5,S2,S4	<i>Agrenia</i>	F3,F4
<i>Lirceus brachyurus</i>	S2	<i>Archisotoma</i>	S2
<i>Lirceus fontinalis</i>	S2	<i>Folsomia</i>	S2
<i>Lirceus lineatus</i>	S2	<i>Isotoma</i>	S1,S2
Cylisticidae	S2	<i>Isotomurus</i>	S2
<i>Cylisticus</i>	S2	<i>Isotomurus palustris</i>	S1,S2
Oniscidae			

Taxonomic name	Agency code	Taxonomic name	Agency code
Onychiuridae		Ephemerellidae	C2,C3,F1,F2,F3,F5,S1, S3,S4
<i>Onychiurus</i>	S2	<i>Attenella</i>	C3,F3,F6,S4
Poduridae		<i>Attenella attenuata</i>	C3,F5,F6,S2,S3
<i>Podura</i>	S4	<i>Attenella margarita</i>	F6
<i>Podura aquatica</i>	S2	<i>Dannella</i>	F1,F3,F6,S4
EPHEMEROPTERA	C2,F1,F3,F5,F6	<i>Dannella lita</i>	F1,S2
CARAPACEA		<i>Dannella simplex</i>	C3,F1,S2
Prosopistomatoidea		<i>Drunella</i>	C3,F1,F3,F6,S2,S4
Baetiscidae		<i>Drunella allegheniensis</i>	C3
<i>Baetisca</i>	C2,F3,F6,S2,S3	<i>Drunella cornuta</i>	F1,F6,S3
<i>Baetisca carolina</i>	S2	<i>Drunella cornuta/cornutella</i>	C3
<i>Baetisca obesa</i>	S2	<i>Drunella cornutella</i>	F1,F6,S2,S3
FURCATERGALIA		<i>Drunella lata</i>	C2,C3,F6,S2,S3
Leptophlebioidea		<i>Drunella tuberculata</i>	C3,F1,F5,F6,S3
Leptophlebiidae	C1,C2,F1,F2,F5,F6,S1, S2,S3,S4	<i>Drunella walkeri</i>	C3,S2,S3
<i>Choroterpes</i>	S2	<i>Ephemerella</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Habrophlebia</i>	C1,S4	<i>Ephemerella aurivillii</i>	S2
<i>Habrophlebia vibrans</i>	F1,S2	<i>Ephemerella dorothea</i>	C3,F1,F4,F6,S2,S3
<i>Habrophlebiodes</i>	C3,F1,S4	<i>Ephemerella excrucians</i>	C3
<i>Leptophlebia</i>	S1,S2,S4	<i>Ephemerella inconstans</i>	F1
<i>Paraleptophlebia</i>	C1,C2,C3,F1,F3,F4,F5, F6,S2,S3,S4	<i>Ephemerella invaria</i>	C3,F1,S2,S3
<i>Paraleptophlebia guttata</i>	F6,S3	<i>Ephemerella invaria/rotunda</i>	C3,F1
<i>Paraleptophlebia mollis</i>	C3,F6,S3	<i>Ephemerella needhami</i>	C3,S2
<i>Paraleptophlebia volitans</i>	F6,S3	<i>Ephemerella rotunda</i>	C3,F1,F4,F6,S2
Ephemeroidea		<i>Ephemerella septentrionalis</i>	C3,F1,S2
Potamanthidae		<i>Ephemerella subvaria</i>	C3,S2,S3
<i>Anthopotamus</i>	C1,F3,S2,S4	<i>Ephemerella/Serratella</i>	F6
<i>Anthopotamus myops</i>	S1	<i>Eurylophella</i>	C1,C3,F1,F5,F6,S1,S2, S3,S4
Polymitarcyidae		<i>Eurylophella bicolor</i>	C3,F1,S2
<i>Ephoron leukon</i>	F3,S2,S4	<i>Eurylophella doris</i>	C3
Ephemeridae	C2,F1,F2	<i>Eurylophella funeralis</i>	C3,F1,F4
<i>Ephemera</i>	C1,C3,F1,F3,S2,S3,S4	<i>Eurylophella poconoensis</i>	C3
<i>Ephemera guttulata</i>	C3	<i>Eurylophella temporalis</i>	C3,F1,S2
<i>Ephemera varia</i>	F1	<i>Eurylophella temporalis/doris</i>	C3
<i>Hexagenia</i>	C2,F3,S2,S4	<i>Eurylophella verisimilis</i>	C3,F1
<i>Litobrantha recurvata</i>	C3,F1	<i>Serratella</i>	C1,C3,F1,F3,F5,F6,S1, S2,S3,S4
<i>Pentagenia</i>	F3	<i>Serratella deficiens</i>	C3,F1,F5,F6,S2,S3
Caenoidea		<i>Serratella frisoni</i>	F5
Caenidae	C2,F1,F2	<i>Serratella serrata</i>	F1,F5,F6,S2,S3
<i>Brachycercus</i>	F1,F5,F6	<i>Serratella serratoides</i>	F6,S2,S3
<i>Caenis</i>	C1,C2,F1,F3,F5,F6,S1, S2,S3,S4	Leptohyphidae	C1,C2,F1,F2,F5
<i>Caenis anceps</i>	F5	<i>Tricorythodes</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Caenis cf. hilaris</i>	F5	PISCIFORMA	
<i>Caenis latipennis</i>	S3	Baetoidea	
<i>Caenis maccafferti</i>	S3		
Ephemerelloidea			

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Ameletidae		Heptageniidae	C2,F1,F2,F3,F5,F6,S1, S2,S3,S4
<i>Ameletus</i>	C1,C2,C3,F1,F4,F6,S2, S3,S4	<i>Cinygmula</i>	C3,F1,S2,S4
Baetidae	C2,F1,F2,F3,F5,S1,S3, S4	<i>Cinygmula subaequalis</i>	C3
<i>Acentrella</i>	C3,F1,F3,F5,F6,S2,S3, S4	<i>Epeorus</i>	C1,C2,C3,F1,F3,F5,F6, S2,S4
<i>Acentrella ampla</i>	C3,F1,F6,S1	<i>Epeorus (Iron)</i>	F4,S3
<i>Acentrella turbida</i>	C3,F5,F6,S2	<i>Epeorus pleuralis/punctatus</i>	C3
<i>Acerpenna</i>	C3,F5,S1,S4	<i>Epeorus vitreus</i>	C3
<i>Acerpenna macdunnoughi</i>	S3	<i>Heptagenia</i>	C1,C2,C3,F3,F5,F6,S2, S3,S4
<i>Acerpenna pygmaea</i>	C3,F4,S2,S3	<i>Heptagenia flavescens</i>	S3
<i>Baetis</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Heptagenia pulla</i>	S3
<i>Baetis brunneicolor</i>	C3,F6,S2,S3	<i>Leucrocuta</i>	C3,F1,F3,F5,F6,S2,S3, S4
<i>Baetis flavistriga</i>	C3,F1,F5,F6,S2,S3	<i>Leucrocuta hebe</i>	C3
<i>Baetis intercalaris</i>	C3,F1,F5,F6,S2,S3	<i>Macdunnoa</i>	C3
<i>Baetis pluto</i>	C3,S3	<i>Nixe</i>	C3,F1,F6,S4
<i>Baetis tricaudatus</i>	C3,F1,F4,F5,F6,S2,S3	<i>Nixe lucidipennis</i>	S2
<i>Callibaetis</i>	C2,F1,F3,F5,S2	<i>Rhithrogena</i>	C3,F4,F6,S4
<i>Centroptilum</i>	C1,C3,F1,F3,F5,S2,S4	<i>Stenacron</i>	C1,C3,F1,F3,F5,S1,S2, S4
<i>Cloeon</i>	C2,C3,F1,F3,S2	<i>Stenacron candidum</i>	S2
<i>Dipheter hageni</i>	C3,F6,S2	<i>Stenacron carolina</i>	C3
<i>Heterocloeon</i>	C3,F3,F5,F6,S2,S4	<i>Stenacron gildersleevi</i>	C3
<i>Heterocloeon curiosum</i>	F5	<i>Stenacron interpunctatum</i>	C3,F5,F6,S2,S3
<i>Paracloeodes</i>	S2	<i>Stenacron minnetonka</i>	C3,S2
<i>Plauditus</i>	F5,S2	<i>Stenacron pallidum</i>	C3,S2
<i>Plauditus cestus</i>	F6	<i>Stenonema</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Plauditus cingulatus</i>	C3,S2	<i>Stenonema femoratum</i>	S3
<i>Plauditus dubius</i>	S2	<i>Stenonema ithaca</i>	C3,F1,F5,F6,S2,S3
<i>Plauditus parvulus</i>	S2	<i>Stenonema luteum</i>	C3,S2
<i>Plauditus punctiventris</i>	C3,S2	<i>Stenonema mediopunctatum</i>	F5,S2
<i>Procloeon</i>	F5,F6,S2	<i>Stenonema mediopunctatum</i>	
<i>Pseudocloeon</i>	C1,C2,F3,F5,S2,S4	<i>Stenonema meririvulanum</i>	F4
<i>Pseudocloeon propinquum</i>	F5,S2,S3	<i>Stenonema mexicanum integrum</i>	S2,S3
Metretopodidae		<i>Stenonema modestum</i>	C3,F1,F5,F6,S2,S3
<i>Siphloplecton</i>	S2	<i>Stenonema pudicum</i>	C3,F1,F4,F6,S2
Siphonuridae	C2,F1,F2,S1	<i>Stenonema pulchellum</i>	F5
<i>Siphonisca</i>	S4	<i>Stenonema terminatum</i>	F1,F6,S2,S3
<i>Siphonurus</i>	C1,C3,F3,S2,S3,S4	<i>Stenonema vicarium</i>	F4,F5,S2,S3
SETISURA		ODONATA	C2
Heptagenioidea		ANISOPTERA	F1
Isonychiidae	C1,C2,F1,F2	Aeschnidae	C2,F1,F2,F5
<i>Isonychia</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Aeschna</i>	C1,C2,F5,S2
<i>Isonychia arida</i>	S2	<i>Aeschna interrupta</i>	S2
<i>Isonychia bicolor</i>	S2,S3	<i>Anax</i>	S2
<i>Isonychia sayi</i>	S2	<i>Basiaeschna</i>	S2

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Basiaeschna janata</i>	S2	<i>Erythemis simplicicollis</i>	S2
<i>Boyeria</i>	C1,C2,C3,F1,F5,F6,S2, S3,S4	<i>Erythrodiplax</i>	S2
<i>Boyeria vinosa</i>	F1,F4,F5,S1,S2	<i>Libellula</i>	C2,F5,S1,S2
<i>Gomphaeschna furcillata</i>	S2	<i>Libellula exusta</i>	S2
Cordulegastridae	C2,F2	<i>Libellula vibrans</i>	S2
<i>Cordulegaster</i>	C2,C3,F1,F4,S2,S3,S4	<i>Pachydiplax</i>	S2
<i>Cordulegaster diastatops</i>	S2	<i>Pachydiplax longipennis</i>	S2
<i>Cordulegaster maculata</i>	F1,S2	<i>Perithemis</i>	F5,S2
Corduliidae	F2	<i>Perithemis domitia</i>	S2
<i>Didymops transversa</i>	S2	<i>Plathemis</i>	S2
<i>Dorocordulia</i>	S2	<i>Plathemis lydia</i>	S2
<i>Epicordulia</i>	S2	<i>Sympetrum</i>	S2
<i>Epitheca</i>	F5	<i>Tramea carolina</i>	S2
<i>Helocordulia</i>	F1,S2	Macromiidae	C2,F5,S4
<i>Helocordulia uhleri</i>	S2	<i>Macromia</i>	C1,C3,F5,S2
<i>Neurocordulia</i>	C3,F5,S2	<i>Macromia illinoisensis</i>	F5,S2
<i>Neurocordulia obsoleta</i>	S2	ZYGOPTERA	
<i>Somatochlora</i>	S2	Calopterygidae	C2,F2,F5,S2
<i>Somatochlora forcipata</i>	S2	<i>Calopteryx</i>	C1,C2,C3,F1,F5,S1,S2, S3,S4
<i>Somatochlora provocans</i>	S2	<i>Hetaerina</i>	C1,C2,S2,S3,S4
<i>Somatochlora tenebrosa</i>	S2	<i>Hetaerina americana</i>	S2
<i>Tetragoneuria</i>	S2	Coenagrionidae	C1,C2,F2,F5,S1,S2,S4
Gomphidae	C1,C2,C3,F1,F2,F5,S1, S2,S3,S4	<i>Amphiagrion</i>	C1,S2
<i>Argomphus</i>	C3,F1,S2,S4	<i>Argia</i>	C1,C2,C3,F5,S1,S2,S4
<i>Dromogomphus</i>	C3,F1,F5,S2,S4	<i>Argia apicalis</i>	C3,S2
<i>Dromogomphus spinosus</i>	S2	<i>Argia bipunctulata</i>	S2
<i>Erpetogomphus</i>	F5,S4	<i>Argia fumipennis violacea</i>	C3,S2
<i>Gomphus</i>	C1,C2,C3,F1,F5,S1,S2, S4	<i>Argia moesta</i>	F5,S2
<i>Gomphus exilis</i>	S2	<i>Chromagrion</i>	S2,S4
<i>Gomphus spicatus</i>	S2	<i>Chromagrion conditum</i>	S2
<i>Hagenius</i>	C3	<i>Coenagrion</i>	S4
<i>Hagenius brevistylus</i>	C2,F5,S2	<i>Enallagma</i>	C1,F5,S2
<i>Lanthus</i>	C1,C2,C3,F1,F5,F6,S2, S3,S4	<i>Enallagma exsulans</i>	S2
<i>Lanthus parvulus</i>	F1,F4,F5,S2	<i>Ischnura</i>	C1,F4,S2
<i>Lanthus/Stylogomphus</i>	C2	<i>Ischnura posita</i>	S2
<i>Octogomphus specularis</i>	S2	<i>Ischnura verticalis</i>	S2
<i>Ophiogomphus</i>	C1,C2,C3,F5,F6,S2,S3, S4	<i>Nehalennia</i>	C1
<i>Progomphus</i>	S2	Lestidae	
<i>Progomphus obscurus</i>	S2	<i>Lestes</i>	S2
<i>Stylogomphus</i>	C1,C2,C3,S4	<i>Lestes vigilax</i>	S2
<i>Stylogomphus albistylus</i>	F1,F5,S1	HEMIPTERA	C2
<i>Stylurus</i>	C3	Belostomatidae	
Libellulidae	F1,F2,S2	<i>Belostoma</i>	F5,S2
<i>Erythemis</i>	F1,S2	<i>Lethocerus americanus</i>	S2
		Corixidae	C1,C2,F5,S2,S4
		<i>Callicorixa</i>	S2
		<i>Hesperocorixa</i>	F4,S2
		<i>Palmarcorixa</i>	C2,S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Ramphocorixa</i>	S2	Capniidae	C1,C2,F1,F2,F6,S3,S4
<i>Sigara</i>	C1,F5,S2	<i>Allocapnia</i>	C1,C2,F1,F4,S1,S2,S4
<i>Trichocorixa</i>	C1,F5,S2,S4	<i>Paracapnia</i>	C1,F4,S2,S4
<i>Trichocorixa verticalis</i>	S2	<i>Paracapnia angulata</i>	S2
Gerridae	C1,C2,F5,S2	<i>Paracapnia opis</i>	C3,S2
Gerrinae	F5	Leuctridae	C2,F1,F2,F3,F5,F6,S3,S4
<i>Aquarius</i>	S2	<i>Leuctra</i>	C1,C2,C3,F1,F3,F6,S2,S3,S4
<i>Aquarius remigis</i>	F5,S2	<i>Leuctra ferruginea</i>	C3,F6,S3
<i>Gerris</i>	C1,C2,S2	<i>Leuctra sibleyi</i>	F4
<i>Gerris marginatus</i>	S2	<i>Leuctra tenuis</i>	F6,S2
<i>Limnoporus</i>	F1	<i>Leuctra truncata</i>	S2
Trepobatinae	F5	<i>Paraleuctra</i>	C1,S2
<i>Metrobates</i>	C1,F5,S2,S4	<i>Paraleuctra sara</i>	S2
<i>Metrobates hesperius</i>	F5,S2	Nemouridae	C1,C2,F1,F2,S4
<i>Trepobates</i>	C1,F5,S2	<i>Amphinemura</i>	C2,C3,F1,F6,S2,S3,S4
<i>Trepobates inermis</i>	F5	<i>Amphinemura delosa</i>	C3,F4,S2
<i>Trepobates pictus</i>	S2	<i>Amphinemura wui</i>	F4
Rhagadotarsinae		<i>Nemoura</i>	C2,S2,S4
<i>Rheumatobates</i>	C1,S2	<i>Nemoura trispinosa</i>	S2
Hebridae		<i>Ostrocerca</i>	S4
<i>Hebrus</i>	S2	<i>Ostrocerca truncata</i>	S2
Hydrometridae		<i>Paranemoura</i>	C1,S4
<i>Hydrometra</i>	S2	<i>Paranemoura perfecta</i>	F4
Mesoveliidae		<i>Prostoia</i>	S4
<i>Mesovelgia</i>	C1,F5,S2	<i>Prostoia similis</i>	F4,S2
<i>Mesovelgia mulsanti</i>	S2	<i>Shipsa rotunda</i>	S2
Naucoridae		<i>Soyedina</i>	F1
<i>Pelocoris</i>	S2	Taeniopterygidae	C2,C3
Nepidae		<i>Bolotoperla rossi</i>	F4
<i>Nepa apiculata</i>	S2	<i>Oemopteryx contorta</i>	F4
<i>Ranatra</i>	S2	<i>Oemopteryx glacialis</i>	S2
<i>Ranatra fusca</i>	F5	<i>Strophopteryx</i>	C1,S4
<i>Ranatra protensa</i>	S2	<i>Strophopteryx fasciata</i>	S2
Notonectidae		<i>Taenionema</i>	S2,S4
<i>Notonecta</i>	F5,S2	<i>Taeniopteryx</i>	C1,F1,S1,S2,S4
<i>Notonecta insulata</i>	S2	<i>Taeniopteryx burksi</i>	S2
<i>Notonecta irrorata</i>	S2	<i>Taeniopteryx nivalis</i>	S2
<i>Notonecta uhleri</i>	S2	<i>Taeniopteryx parvula</i>	S2
Pleidae		SYSTELLOGNATHA	
<i>Neoplea striola</i>	S2	Chloroperlidae	C1,C2,C3,F1,F2,F5,F6,S4
Saldidae	F1	<i>Alloperla</i>	C3,F1,F6,S4
Veliidae	C2	<i>Haploperla</i>	C1,C2,F1,S4
<i>Microvelia</i>	C1,C3,F5,S1,S2,S4	<i>Haploperla brevis</i>	S2
<i>Microvelia borealis</i>	S2	<i>Rasvena</i>	C3
<i>Rhagovelia</i>	C1,C2,F1,F5,S1,S2,S4	<i>Suwallia</i>	C3,F1,S4
<i>Rhagovelia obesa</i>	F5,S2		
PLECOPTERA	F1,F3,F5,S1,S4		
EUHOLOGNATHA			

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Sweltsa</i>	C2,C3,F1,F4,F5,F6,S3, S4	<i>Remenus</i>	S4
Peltoperlidae	C2,C3,F1,F2,S4	<i>Remenus bilobatus</i>	C3
<i>Peltoperla</i>	C1,C2,F5,S2,S4	<i>Yugus</i>	S4
<i>Tallaperla</i>	C3,F1,F4,F5,F6,S1,S2, S3,S4	<i>Yugus bulbosus</i>	C2,C3,F1
Perlidae	C1,C2,C3,F1,F2,F3,F5, F6,S3,S4	Pteronarcyidae	C2,F2
<i>Acroneuria</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4	<i>Pteronarcys</i>	C2,C3,F1,F5,F6,S2,S4
<i>Acroneuria abnormis</i>	C2,C3,F1,F4,F6,S2,S3	<i>Pteronarcys biloba</i>	C3,F4,S3
<i>Acroneuria carolinensis</i>	C2,C3,F1,F4,F6,S2,S3	<i>Pteronarcys comstocki</i>	C3
<i>Acroneuria internata</i>	C2,C3	<i>Pteronarcys proteus</i>	C3,F4
<i>Acroneuria lycorias</i>	S2	COLEOPTERA	F3,S4
<i>Agnatina</i>	C1,C2,C3,F1,F3,F5,F6, S4	ADEPHAGA	
<i>Agnatina annulipes</i>	S3	Gyrinidae	C1,C2,F2
<i>Agnatina capitata</i>	C2,C3,F4,F5,F6,S2,S3	<i>Dineutus</i>	C1,C2,C3,F3,F5,F6,S2, S4
<i>Attaneuria</i>	S4	<i>Dineutus discolor</i>	F5
<i>Attaneuria ruralis</i>	C2	<i>Gyrinus</i>	C3,F1,F5,S2
<i>Eccopectura</i>	C3,F1,S4	Halipilidae	
<i>Eccopectura xanthenes</i>	C3,S2	<i>Haliplus</i>	C2,S2,S4
<i>Neoperla</i>	C1,C2,C3,F3,S4	<i>Peltodytes</i>	F1,F5,S2
<i>Neoperla clymene</i>	C3,S2	<i>Peltodytes lengi</i>	F4
<i>Paragnetina</i>	C1,C2,C3,F1,F3,F5,F6, S2,S3,S4	Dytiscidae	C1,C2,F1,F2,F6,S4
<i>Paragnetina immarginata</i>	C2,C3,F5,F6,S2,S3	<i>Acilius</i>	S2
<i>Paragnetina media</i>	C2,C3,F6,S2,S3	<i>Agabetes</i>	S2
<i>Perlesta</i>	C2,C3,F1,F3,F5,F6,S4	<i>Agabus</i>	C1,C2,F6,S2,S3
<i>Perlesta placida</i>	C3,S2	<i>Bidessus</i>	S2
<i>Perlinella</i>	F1,S2	<i>Copelatus</i>	S2
<i>Perlinella drymo</i>	S2	<i>Cybister</i>	S2
Perlodidae	C1,C2,C3,F1,F2,F6,S3, S4	<i>Deronectes</i>	S2
<i>Clioperla</i>	S4	<i>Derovatellus</i>	S2
<i>Cultus</i>	C3	<i>Dytiscus</i>	C3,S4
<i>Diploperla</i>	S4	<i>Eretes</i>	S2
<i>Helopicus</i>	S4	Hydroporini	F5
<i>Isogenoides</i>	C3,S4	<i>Hydroporus</i>	S1,S2
<i>Isoperla</i>	C1,C2,C3,F1,F6,S1,S2, S3,S4	<i>Hydroporus niger</i>	S2
<i>Isoperla bilineata</i>	C3,F1	<i>Hydrovatus</i>	S2
<i>Isoperla holochlora</i>	C3,S3	<i>Hygrotus</i>	C1
<i>Isoperla lata</i>	C3,F1	<i>Ilybius</i>	S2
<i>Isoperla marlynia</i>	C3,F4,S2	<i>Laccophilus</i>	C1,C3,F5,S2,S4
<i>Isoperla orata</i>	C3	<i>Oreodytes</i>	F5,F6
<i>Isoperla similis</i>	C3,F4,S2	<i>Thermonectus</i>	S2
<i>Isoperla transmarina</i>	C3,S2	<i>Uvarus</i>	S2
<i>Malirekus</i>	F6,S4	Noteridae	C2
<i>Malirekus iroquois</i>	F4	<i>Hydrocanthus</i>	C2,C3
		<i>Hydrocanthus iricolor</i>	S2
		POLYPHAGA	
		Helophoridae	
		<i>Helophorus</i>	C1,F1,S2
		Hydrochidae	
		<i>Hydrochus</i>	C3,F5,S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
Hydrophilidae	C1,C2,F2,S3,S4	<i>Gonielmis</i>	S4
<i>Anacaena</i>	S2	<i>Macronychus</i>	C1,C3,F3,S2,S4
<i>Berosus</i>	C1,C2,F5,S1,S2,S4	<i>Macronychus glabratus</i>	C1,F1,F4,F5,F6,S1,S2, S3
<i>Cercyon</i>	S2	<i>Microcylloepus</i>	C1,C3,F3,S4
<i>Chaetarthria</i>	S2	<i>Microcylloepus pusillus</i>	F5,S1,S2
<i>Crenitis</i>	F4	<i>Optioservus</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Derallus</i>	C3	<i>Optioservus fastiditus</i>	S3
<i>Enochrus</i>	F4,S2	<i>Optioservus immunis</i>	F1,S2,S3
<i>Helochaeres</i>	S1,S2	<i>Optioservus ovalis</i>	F1,F5,F6,S2,S3
<i>Helocombus</i>	S2	<i>Optioservus trivittatus</i>	F1,F5,F6,S2,S3
<i>Helocombus bifidus</i>	S2	<i>Oulimnius</i>	C1,C3,F1,F3,F6,S2,S3, S4
<i>Hydrobius</i>	C1,F1,S2,S3,S4	<i>Oulimnius latiusculus</i>	F1,F4,F5,F6,S1,S2
<i>Hydrochara</i>	C1	<i>Promoresia</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S4
<i>Laccobius</i>	F1,S2	<i>Promoresia elegans</i>	F5,F6,S2,S3
<i>Paracymus</i>	F5,S2	<i>Promoresia tardella</i>	F1,F4,F6,S2,S3
<i>Sperchopsis</i>	F1,S2	<i>Stenelmis</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Tropisternus</i>	C3,F5,S2	<i>Stenelmis bicarinata</i>	S3
Staphylinidae	S2	<i>Stenelmis cheryl</i>	S3
<i>Bledius</i>	S2	<i>Stenelmis concinna</i>	F1,F5,S2,S3
<i>Diglotta</i>	S2	<i>Stenelmis crenata</i>	F1,F5,S2,S3
<i>Stenus</i>	S2	<i>Stenelmis decorata</i>	S2
Salpingidae	S2	<i>Stenelmis humerosa</i>	S2
Hydraenidae	C2	<i>Stenelmis lateralis</i>	S2
<i>Limnebius</i>	C1	<i>Stenelmis markeli</i>	S2
Psephenidae	C2,F2	<i>Stenelmis mera</i>	F1,S2
<i>Ectopria</i>	C1,C2,C3,F1,F5,S2,S3, S4	<i>Stenelmis mirabilis</i>	S2
<i>Ectopria nervosa</i>	C1,F4,S1,S2,S3	<i>Stenelmis musgravei</i>	F5
<i>Psephenus</i>	C1,C2,C3,F1,F3,F6,S2, S3,S4	<i>Stenelmis sandersoni</i>	F5,S2
<i>Psephenus herricki</i>	C3,F1,F4,F5,S1,S2,S3	<i>Stenelmis vittipennis</i>	S2
Dryopidae	C1	Ptilodactylidae	C2
<i>Helichus</i>	C1,F4,S4	<i>Anchytarsus</i>	C2,C3,F1,S2,S4
<i>Helichus basalis</i>	F5,S2	<i>Anchytarsus bicolor</i>	C1,F5,S1,S2
<i>Helichus fastigiatus</i>	C1,F1,S2	Lutrochidae	
<i>Helichus lithophilus</i>	S2	<i>Lutrochus</i>	C3
Scirtidae	F5	Chrysomelidae	C1
<i>Cyphon</i>	S2	<i>Agasicles</i>	S1
<i>Elodes</i>	S2	<i>Donacia</i>	F1,S2
<i>Scirtes</i>	S2	<i>Galerucella</i>	S2
Elmidae	C2,F1,F2,F3,F5,F6,S1, S2,S4	Curculionidae	C1,C3,F4,F5,S2,S4
<i>Ancyronyx</i>	C1,C3,S2,S4	<i>Hyperodes</i>	S2
<i>Ancyronyx variegata</i>	C1,F5,S1,S2,S3	<i>Onychylis</i>	S2
<i>Dubiraphia</i>	C1,C3,F1,F5,F6,S1,S2, S3,S4	<i>Stenopelmus rufinasus</i>	S2
<i>Dubiraphia bivittata</i>	S2	Lampyridae	
<i>Dubiraphia quadrinotata</i>	S2	<i>Photurus</i>	S2
<i>Dubiraphia vittata</i>	S3		

Taxonomic name	Agency code	Taxonomic name	Agency code
MEGALOPTERA	C2,C3	Hydroptilinae	
Corydalidae	C2,F2	<i>Agraylea</i>	C1,S2,S3
<i>Chauliodes</i>	C1,C2,C3,F3,S2	<i>Alisotrichia</i>	S4
<i>Chauliodes pectinicornis</i>	S2	<i>Hydroptila</i>	C1,C2,F1,F3,F4,F5,F6, S1,S2,S3,S4
<i>Corydalus</i>	C1,C2,C3,F3,S2,S4	<i>Hydroptila</i> nr. <i>albicornis</i> sp. 1	S3
<i>Corydalus cornutus</i>	F5,F6,S1,S2,S3	<i>Hydroptila consimilis</i>	S3
<i>Nigronia</i>	C1,C2,C3,F1,F6,S1,S2, S4	<i>Hydroptila</i> nr. <i>hamata</i>	S2
<i>Nigronia fasciatus</i>	F4	<i>Hydroptila</i> nr. <i>hamata</i> sp. 1	S3
<i>Nigronia serricornis</i>	C3,F1,F4,F5,S2,S3	<i>Hydroptila</i> nr. <i>waubesiana</i>	S2
Sialidae	C2,F2	<i>Leucotrichia</i>	C1,C3,F5,F6,S2,S3,S4
<i>Sialis</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Leucotrichia pictipes</i>	F5,S1,S2
<i>Sialis hasta</i>	S2	<i>Neotrichia</i>	C2
<i>Sialis iola</i>	S2	<i>Ochrotrichia</i>	C1,S2,S4
<i>Sialis joppa</i>	S2	<i>Orthotrichia</i>	S2
<i>Sialis mohri</i>	S2	<i>Oxyethira</i>	F6,S2,S4
<i>Sialis velata</i>	S2	<i>Oxyethira pallida</i>	F5
NEUROPTERA		<i>Stactobiella</i>	C1
Sisyridae	C1,C2	Glossosomatidae	F1,F2,F3,F5,F6,S4
<i>Climacia</i>	C1	Glossosomatinae	
<i>Climacia areolaris</i>	C1,C3,S2	<i>Glossosoma</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4
<i>Sisyra</i>	F5	Agapetinae	
TRICHOPTERA	F1,F3,F5,F6,S4	<i>Agapetus</i>	C3,F1,F6,S2,S4
SPICIPALPIA		Protoptilinae	
Rhyacophilidae	C2,F2,F3	<i>Culoptila</i>	C1,F3,F5,F6
<i>Rhyacophila</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4	<i>Protoptila</i>	C1,F6,S2,S3,S4
<i>Rhyacophila acutiloba</i>	C3,F5	ANNULIPALPIA	
<i>Rhyacophila amicus</i>	S2	Philopotamoidea	
<i>Rhyacophila carolina</i>	C3,F6,S3	Philopotamidae	C1,C2,F1,F2,F3,S4
<i>Rhyacophila carpenteri</i>	F6,S3	Philopotaminae	
<i>Rhyacophila fenestra</i>	S2	<i>Dolophilodes</i>	C1,C2,C3,F1,F5,F6,S1, S2,S3,S4
<i>Rhyacophila formosa</i>	C3,F5	<i>Dolophilodes distinctus</i>	C3,F4,F5
<i>Rhyacophila fuscula</i>	C1,C2,C3,F1,F4,F5,F6, S2,S3	<i>Dolophilodes major</i>	C3
<i>Rhyacophila glaberrima</i>	C3,F4,S2	<i>Wormaldia</i>	C1,C2,C3,F1,S2,S3,S4
<i>Rhyacophila invaria</i>	S2	<i>Wormaldia moesta</i>	C3
<i>Rhyacophila manistee</i>	S2	<i>Wormaldia shawnee</i>	C3
<i>Rhyacophila melita</i>	C2,C3,F6,S2,S3	Chimarrinae	
<i>Rhyacophila minor</i>	F4	<i>Chimarra</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4
<i>Rhyacophila nigrita</i>	C3,F4,S2	<i>Chimarra aterrima</i>	C3,S2,S3
<i>Rhyacophila</i> sp. 4	S3	<i>Chimarra obscura</i>	C3,S2,S3
<i>Rhyacophila</i> sp. 5	S2	<i>Chimarra socia</i>	S2,S3
<i>Rhyacophila torva</i>	C3,F4,S3	Hydropsychoidea	
Hydroptilidae	C2,F2,F5,F6,S3,S4	Psychomyiidae	S2
Ptilocolepinae		Psychomyiinae	
<i>Palaeagapetus</i>	S4	<i>Lype</i>	C1,C3,S1,S2,S4
<i>Palaeagapetus celsus</i>	F1,F4	<i>Lype diversa</i>	F1,F4,S2,S3

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Psychomyia</i>	C1,F1,F5,S2,S4	<i>Hydropsyche scalaris</i>	F5,S2,S3
<i>Psychomyia flavida</i>	F5,F6,S3	<i>Hydropsyche valanis</i>	S2
<i>Psychomyia nomada</i>	F5,S2	<i>Hydropsyche venularis</i>	C3,F5,S2,S3
<i>Tinodes</i>	C2,S2	<i>Potamyia</i>	C1,F3
Dipseudopsidae		Macronematinae	
<i>Phylocentropus</i>	C1,F1,S1,S2	<i>Macrostemum</i>	C1,C2,C3,F3,F5,F6,S2, S3,S4
Polycentropodidae	C2,F1,F2,F5,S1,S3,S4	<i>Macrostemum carolina</i>	S2,S3
Polycentropodinae		<i>Macrostemum zebratum</i>	F5
<i>Cernotina</i>	F1,S4	INTEGRIPALPIA	
<i>Cymellus</i>	C1,S4	Phryganeioidea	
<i>Neureclipsis</i>	C1,C3,F3,F5,F6,S2,S3, S4	Phryganeidae	C2,F2
<i>Nyctiophylax</i>	C1,F1,F3,S2,S4	Phryganeinae	
<i>Nyctiophylax moestus</i>	S1	<i>Agrypnia</i>	S2
<i>Polycentropus</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Banksiola</i>	S2
Hydropsychidae	C2,C3,F1,F2,F3,F5,F6, S1,S3,S4	<i>Oligostomis</i>	F5,F6,S2,S3
Arctopsychinae		<i>Phryganea</i>	S2
<i>Arctopsyche</i>	F6	<i>Ptilostomis</i>	S2
<i>Parapsyche</i>	C1,C2,F1,F6,S4	Limnephiloidea	
<i>Parapsyche apicalis</i>	F4,F6	Brachycentridae	C2,F2,S2,S3
Diplectroninae		<i>Adicrophleps hitchcocki</i>	F4,F6,S4
<i>Diplectrona</i>	C1,C3,F1,F6,S2,S4	<i>Brachycentrus</i>	C1,C2,C3,F1,F3,F5,F6, S2,S4
<i>Diplectrona modesta</i>	C3,F1,F4,F5,S1,S2	<i>Brachycentrus americanus</i>	S2
Hydropsychinae		<i>Brachycentrus appalachia</i>	F5,F6,S3
<i>Ceratopsyche</i>	C1,C3,F1,F3,F5,S2,S4	<i>Brachycentrus lateralis</i>	C3,F5,S2,S3
<i>Ceratopsyche aenigma</i>	F5	<i>Brachycentrus nigrosoma</i>	F1
<i>Ceratopsyche alhedra</i>	F1,F5,S2	<i>Brachycentrus numerosus</i>	F5,F6,S2,S3
<i>Ceratopsyche bifida</i> gr.	C2,F1	<i>Brachycentrus solomoni</i>	F5,S3
<i>Ceratopsyche bronta</i>	C3,F1,F5,F6,S2,S3	<i>Micrasema</i>	C1,C2,C3,F1,F3,F5,F6, S2,S3,S4
<i>Ceratopsyche cheilonis</i>	F5	<i>Micrasema rusticum</i>	S2
<i>Ceratopsyche morosa</i>	C3,F1,F5,F6,S2,S3	<i>Micrasema sprulesi</i>	F4
<i>Ceratopsyche slossonae</i>	C3,F1,F5,S2,S3	<i>Micrasema wataga</i>	C3,F5,S2
<i>Ceratopsyche sparna</i>	C2,C3,F1,F4,F5,F6,S2, S3	<i>Micrasema</i> sp. 1	S3
<i>Ceratopsyche ventura</i>	C3,F1,F4	<i>Micrasema</i> sp. 2	S3
<i>Ceratopsyche vexe</i>	C3	Lepidostomatidae	C2,F2,S2
<i>Ceratopsyche walkeri</i>	C3,F1,F5	Lepidostomatinae	
<i>Cheumatopsyche</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Lepidostoma</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4
<i>Cheumatopsyche campyla</i>	S2	Theliopsychinae	
<i>Hydropsyche</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4	<i>Theliopsyche</i>	S2
<i>Hydropsyche betteni</i>	C2,C3,F1,F5,S2,S3	Limnephilidae	C1,C2,F1,F2,F6,S1,S2, S3,S4
<i>Hydropsyche decalda</i>	S2	Dicosmoecinae	
<i>Hydropsyche demora</i>	F5,S2	<i>Ironoquia</i>	F1,F4,S2
<i>Hydropsyche depravata</i> gr.	F5	<i>Onocosmoecus</i>	C2,F1,F6
<i>Hydropsyche leonardi</i>	F5,S2,S3	Pseudostenophylacinae	
		<i>Pseudostenophylax</i>	F1,F3,F6,S2,S4

Taxonomic name	Agency code	Taxonomic name	Agency code
Limnephilinae		<i>Anisocentropus pyraloides</i>	C1
<i>Frenesia</i>	F5,S2	<i>Heteroplectron</i>	S2
<i>Hesperophylax</i>	F1,F6,S2,S4	<i>Heteroplectron americanum</i>	S2
<i>Hesperophylax argus</i>	F1	Odontoceridae	C2,F2
<i>Hydatophylax</i>	C1,C2,C3,F6,S1,S4	Odontocerinae	
<i>Ironoquia</i>	C3	<i>Psilotreta</i>	C1,C2,C3,F1,F3,F5,F6, S2,S3,S4
<i>Lenarchus</i>	S2	<i>Psilotreta frontalis</i>	F4,S2
<i>Limnephilus</i>	C2,F6,S2,S4	<i>Psilotreta labida</i>	C3,F5
<i>Platycentropus</i>	C3,S2	Sericostomatoidea	
<i>Psychoglypha subborealis</i>	F5	Sericostomatidae	
<i>Pycnopsyche</i>	C2,C3,F1,F4,F5,F6,S2, S3,S4	<i>Agarodes</i>	S2,S4
<i>Pycnopsyche gentilis</i>	C3	Beraeidae	
Apataniidae	C1	<i>Beraea</i>	C2
<i>Apatania</i>	C1,C2,F1,F3,F5,F6,S2, S3,S4	Helicopsychidae	C2
Uenoidae	C2	<i>Helicopsyche</i>	C1,C3,F3,F6,S2,S4
Thremmatinae		<i>Helicopsyche borealis</i>	C3,F5,S2,S3
<i>Neophylax</i>	C1,C2,C3,F1,F3,F5,F6, S2,S3,S4	LEPIDOPTERA	C3,F4,S1,S3
<i>Neophylax concinnus</i>	F4	Nepticulidae	
<i>Neophylax consimilis</i>	F5,S1	<i>Nepticula</i>	S2
<i>Neophylax nacatus</i>	F4	Noctuidae	C1
Goeridae		<i>Archanara</i>	C1
Goerinae	F1	Pyralidae	C1,C2,C3,F1,F2,F6,S2
<i>Goera</i>	C1,F1,S2,S3,S4	<i>Acentria</i>	C2,S2
<i>Goerita</i>	S2	<i>Crambus</i>	F5
Leptoceroidea		<i>Elophila</i>	S2
Leptoceridae	C1,C2,F1,F2,F3,F5,F6, S2,S4	<i>Nymphula</i>	C1
Leptocerinae		<i>Nymphuliella</i>	S2
<i>Ceraclea</i>	C1,C2,F1,F3,F5,F6,S2, S4	<i>Parapoynx</i>	S2,S4
<i>Leptocerus</i>	S2	<i>Petrophila</i>	C1,F5,S1,S2,S3,S4
<i>Mystacides</i>	C1,C2,F1,F6,S2,S3,S4	<i>Synclita</i>	C1,S2
<i>Mystacides sepulchralis</i>	F5,S2	HYMENOPTERA	
<i>Nectopsyche</i>	C1,F1,S2	APOCRITA	
<i>Oecetis</i>	C1,C2,C3,F1,F5,F6,S2, S3,S4	Ichneumonoidea	
<i>Oecetis avara</i>	C3,F5,F6	Ichneumonidae	C1
<i>Oecetis cinerascens</i>	F5	DIPTERA	C2,C3,F1,F3,F6,S1
<i>Oecetis persimilis</i>	F5,F6	NEMATOCERA	
<i>Oecetis</i> sp. A	F5	Blephariceridae	C1,C2,S3
<i>Setodes</i>	S4	<i>Blepharicera</i>	C3,F1,F4,F5,F6,S2,S4
<i>Triaenodes</i>	C1,F1,S2,S4	Ceratopogonidae	C1,C3,F1,F2,F3,F5,F6, S2,S3,S4
Molannidae	C2	Dasyheleinae	F1
<i>Molanna</i>	C1,C2,F1,F3,S2,S4	<i>Dasyhelea</i>	F1,F5,S1,S4
<i>Molanna blenda</i>	F4	Forcipomyiinae	
Calamoceratidae		<i>Atrichopogon</i>	S1,S2
		Ceratopogoninae	F1,F6
		<i>Alluaudomyia</i>	S2
		<i>Alluaudomyia needhami</i>	S2
		<i>Bezzia</i>	C3,F1,F4,F5,S1,S2,S4

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Bezzia glabra</i>	S2	<i>Conchapelopia fasciata</i>	S2
<i>Bezzia opaca</i>	S2	<i>Conchapelopia flavifrons</i>	F1,S2
<i>Bezzia setulosa</i>	S2	<i>Conchapelopia pallens</i>	S2
<i>Bezzia varicolor</i>	S2	<i>Conchapelopia rurika</i>	S2
<i>Ceratopogon</i>	F1,F4	<i>Conchapelopia telema</i>	S2
<i>Culicoides</i>	S2,S4	<i>Hayesomyia</i>	F1
<i>Culicoides sanguisugus</i>	S2	<i>Hayesomyia senata</i>	S2
<i>Palpomyia</i>	F4,F5,S2	<i>Helopelopia</i>	F1
<i>Palpomyia lineata</i>	S2	<i>Helopelopia cornuticaudata</i>	S2
<i>Palpomyia tibialis</i>	S2	<i>Hudsonimyia karelena</i>	S3
<i>Probezzia</i>	C3,F1,F4,S1,S2,S4	<i>Labrundinia</i>	F5,S2,S4
<i>Stilobezzia</i>	S2	<i>Labrundinia pilosella</i>	S2
<i>Stilobezzia antennalis</i>	S2	<i>Larsia</i>	F1,F4
Chaoboridae		<i>Meropelopia</i>	F1,F4,S1
<i>Chaoborus</i>	C1,S2,S4	<i>Meropelopia americanus</i>	F1
<i>Chaoborus punctipennis</i>	S2	<i>Meropelopia flavifrons</i>	F1
Chironomidae	C1,C2,C3,F1,F2,F3,F5, F6,S1,S2,S4	<i>Nilotanypus</i>	C1,F1,F6,S4
Tanypodinae	C2,C3,F1,F5,F6,S2,S4	<i>Nilotanypus fimbriatus</i>	F1,S2
Coelotanypodini		<i>Paramerina</i>	F1,F5
<i>Clinotanypus</i>	F1,F5,S2	<i>Pentaneura</i>	F5,F6,S2,S3,S4
<i>Clinotanypus pinguis</i>	S2	<i>Pentaneura carnea</i>	S2
<i>Coelotanypus tricolor</i>	S2	<i>Pentaneura inconspicua</i>	S3
Macropelopiini		<i>Rheopelopia</i>	F1,F4,S1,S2
<i>Apsectrotanypus</i>	F1,S2	<i>Rheopelopia perda</i>	S2
<i>Apsectrotanypus trifascipennis</i>	S2	<i>Telopelopia</i>	F1
<i>Brundiniella</i>	F4	<i>Telopelopia okoboji</i>	F6,S2
<i>Brundiniella eumorpha</i>	F1	<i>Thienemannimyia</i>	F1,S1,S2,S4
<i>Macropelopia</i>	F1,F6,S2	<i>Thienemannimyia gr.</i>	F1,F5,F6,S2,S3
<i>Macropelopia decedens</i>	S2	<i>Thienemannimyia norena</i>	S2
<i>Psectrotanypus</i>	S2	<i>Trissopelopia</i>	F1,F5,F6,S2
<i>Psectrotanypus dyari</i>	S2	<i>Zavrelimyia</i>	F1,F4,F6,S1,S3
Natarsiini		Procladiiini	
<i>Natarsia</i>	F1,S1,S2	<i>Djalmabatista</i>	S2
<i>Natarsia baltimoreus</i>	F1,F4	<i>Procladius</i>	C1,F1,F5,F6,S2,S4
<i>Natarsia fastuosa</i>	S2	<i>Procladius (Psilotanypus) bellus</i>	F1,S2
Pentaneurini		<i>Procladius culiciformis</i>	S2
<i>Ablabesmyia</i>	C1,F1,F5,F6,S1,S2	<i>Procladius curtus</i>	S2
<i>Ablabesmyia annulata</i>	S2	<i>Procladius riparius</i>	S2
<i>Ablabesmyia aspera</i>	S2	Tanypodini	
<i>Ablabesmyia janta</i>	S2	<i>Tanypus</i>	F1,S2
<i>Ablabesmyia mallochii</i>	F1,S2	<i>Tanypus neopunctipennis</i>	S2
<i>Ablabesmyia monilis</i>	S2	<i>Tanypus punctipennis</i>	S2
<i>Ablabesmyia peleensis</i>	S2	<i>Tanypus stellatus</i>	S2
<i>Ablabesmyia simpsoni</i>	S2	Diamesinae	F5
<i>Cantopelopia aleta</i>	S2	Diamesini	
<i>Conchapelopia</i>	C1,F1,F4,F6,S1,S2	<i>Diamesa</i>	C1,F1,F4,F5,F6,S1,S2, S3,S4
<i>Conchapelopia americana</i>	F1,S2	<i>Diamesa nivoriunda</i>	S2
<i>Conchapelopia currani</i>	S2	<i>Pagastia</i>	F1,F5,F6

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Pagastia orthogonia</i>	S2	<i>Cricotopus fuscatus</i>	S2
<i>Pagastia</i> sp. A	S3	<i>Cricotopus fuscus</i>	S2
<i>Potthastia</i>	C1,F1,F5,F6	<i>Cricotopus infuscatus</i>	S2
<i>Potthastia gaedii</i>	F6,S1,S3	<i>Cricotopus intersectus</i>	S2,S3
<i>Potthastia gaedii</i> gr.	F1	<i>Cricotopus junus</i>	S2
<i>Potthastia longimana</i>	F6,S2,S3	<i>Cricotopus laetus</i>	S2
<i>Pseudodiamesa</i>	C1,F1	<i>Cricotopus laricomalis</i>	S2
<i>Pseudodiamesa pertinax</i>	S2	<i>Cricotopus nostocicola</i>	S3
<i>Sympotthastia</i>	F6,S2,S4	<i>Cricotopus pirifer</i>	S2
<i>Sympotthastia</i> sp. 2	S2	<i>Cricotopus reversus</i>	S2
Protanypini		<i>Cricotopus reversus</i> gr.	S2,S3
<i>Protanypus</i>	S2	<i>Cricotopus slossonae</i>	S2
Prodiamesinae		<i>Cricotopus sylvestris</i>	S2
<i>Monodiamesa bathyphila</i>	S2	<i>Cricotopus sylvestris</i> gr.	F1,S3
<i>Odontomesa</i>	F1,S2	<i>Cricotopus tibialis</i>	S2
<i>Prodiamesa</i>	S2	<i>Cricotopus tremulus</i>	S2
<i>Prodiamesa olivacea</i>	F1,S2	<i>Cricotopus tremulus</i> gr.	F1,S2,S3
Orthoclaadiinae	C2,C3,F1,F5,F6,S2,S4	<i>Cricotopus triannulatus</i>	S2
Corynoneurini		<i>Cricotopus tricinctus</i>	S2
<i>Corynoneura</i>	C1,F1,F4,F5,F6,S1,S2, S3,S4	<i>Cricotopus trifascia</i>	F1,S2
<i>Corynoneura taris</i>	S2	<i>Cricotopus trifascia</i> gr.	F1,F5,S3
Orthoclaadiini	F1	<i>Cricotopus trifasciatus</i>	S2
<i>Acamptocladus</i>	S2	<i>Cricotopus vierriensis</i>	S2,S3
<i>Acricotopus</i>	S2	<i>Cricotopus vierriensis</i> gr.	F1
<i>Brillia</i>	C1,F1,F5,F6,S1,S2,S3, S4	<i>Diplocladius</i>	C1,F1,F4,S2
<i>Brillia flavifrons</i>	F1,F4,S2	<i>Diplocladius cultriger</i>	S1,S2
<i>Brillia flavifrons</i> gr.	F1	<i>Doithrix</i>	F4,S2
<i>Brillia modesta</i>	S2	<i>Eukiefferiella</i>	C1,F1,F5,F6,S1,S2,S4
<i>Brillia parva</i>	F1,F4,S2,S3	<i>Eukiefferiella brehmi</i>	F4
<i>Brillia sera</i>	F4	<i>Eukiefferiella brehmi</i> gr.	F1,S3
<i>Bryophaenocladus</i>	S2	<i>Eukiefferiella brevicealcar</i>	F1,F4,S2
<i>Cardiocladius</i>	C1,F1,F5,F6,S2,S4	<i>Eukiefferiella brevicealcar</i> gr.	F1,S3
<i>Cardiocladius albiplumus</i>	F6,S2	<i>Eukiefferiella claripennis</i>	F1,F4,S2
<i>Cardiocladius obscurus</i>	S2,S3	<i>Eukiefferiella claripennis</i> gr.	F1,S3
<i>Chaetocladus</i>	C1,F1,F6,S1	<i>Eukiefferiella devonica</i>	F4,F6,S2
<i>Chaetocladus dentiforceps</i>	F4	<i>Eukiefferiella devonica</i> gr.	F1,S3
<i>Chaetocladus piger</i>	F4	<i>Eukiefferiella gracei</i>	F4,S2
<i>Cricotopus</i>	C1,F1,F5,F6,S1,S2,S4	<i>Eukiefferiella gracei</i> gr.	F1
<i>Cricotopus albiforceps</i>	F1,S2	<i>Eukiefferiella pseudomontana</i>	F4,F6,S2
<i>Cricotopus algarum</i>	S2	<i>Eukiefferiella pseudomontana</i> gr.	S3
<i>Cricotopus bicinctus</i>	F1,F4,F6,S2,S3	<i>Eukiefferiella rectangularis</i>	F4,S2
<i>Cricotopus bicinctus</i> gr.	F1,F5	<i>Eukiefferiella rectangularis</i> gr.	F1
<i>Cricotopus curtus</i>	S2	<i>Georthocladus</i>	F4
<i>Cricotopus cylindraceus</i>	S2	<i>Halocladus</i>	S2
<i>Cricotopus festivellus</i>	F1,S2	<i>Heleniella</i>	F4
<i>Cricotopus flavocinctus</i>	S2	<i>Heterotrissocladus</i>	C1,F1,F6,S2
<i>Cricotopus fugax</i>	S2	<i>Heterotrissocladus hirtapex</i>	F4
		<i>Heterotrissocladus marcidus</i>	S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Heterotrissocladius marcidus</i> gr.	F1,S3	<i>Parametricnemus lundbecki</i>	F1,S2,S3
<i>Hydrobaenus</i>	F4,S1,S2	<i>Parametricnemus stylatus</i>	S2
<i>Hydrobaenus johannseni</i>	S2	<i>Paraphaenocladius</i>	F1,F4,F6,S2
<i>Krenosmittia</i>	F6,S2	<i>Paraphaenocladius</i> sp. 1	S2
<i>Limnophyes</i>	F1,F4,F6,S3	<i>Paratrichocladius</i>	F1,F4,S1,S2
<i>Lopescladius</i>	F1,S2	<i>Psectrocladius</i>	C1,F1,F5,F6,S2,S3
<i>Metriocnemus</i>	C1,F6,S2	<i>Psectrocladius barbimanus</i>	S2
<i>Metriocnemus knabi</i>	S2	<i>Psectrocladius dilatatus</i> gr.	S3
<i>Nanocladius</i>	C1,F1,F4,F5,F6,S1,S2, S3	<i>Psectrocladius elatus</i>	S2
<i>Nanocladius (Plecopteracolu- luthus)</i>	C1,S3	<i>Psectrocladius flavus</i>	S2
<i>Nanocladius (Plecopteracolu- luthus) downesi</i>	S3	<i>Psectrocladius nigrus</i>	S2
<i>Nanocladius crassicornus</i>	F1,S2	<i>Psectrocladius octomaculatus</i>	S2
<i>Nanocladius distinctus</i>	S2	<i>Psectrocladius pilosus</i>	S2
<i>Nanocladius minimus</i>	S2	<i>Psectrocladius psilopterus</i>	S2
<i>Nanocladius parvulus</i>	F1	<i>Psectrocladius simulans</i>	S2
<i>Nanocladius parvulus</i> gr.	F1	<i>Psectrocladius sordidellus</i>	S2
<i>Nanocladius rectinervis</i>	F1,S2	<i>Psectrocladius vernalis</i>	S2
<i>Orthocladius</i>	C1,F1,F5,F6,S1,S2,S4	<i>Psectrocladius</i> sp. 1	S2
<i>Orthocladius (Eudactylocladius)</i>	F1	<i>Psectrocladius</i> sp. 4	S2
<i>Orthocladius (Euorthocladius)</i>	F1	<i>Pseudorthocladius</i>	F1,F4,S2
<i>Orthocladius (Euorthocladius)</i>	S2	<i>Pseudosmittia</i>	F4
<i> rivulorum</i>		<i>Psilometricnemus</i>	F4
<i>Orthocladius (Symposiocladius)</i>	F1,F6,S2,S3	<i>Rheocricotopus</i>	F1,F5,F6,S1,S2,S4
<i> lignicola</i>		<i>Rheocricotopus eminellobus</i>	F4
<i>Orthocladius annectens</i>	S2,S3	<i>Rheocricotopus pauciseta</i>	F1
<i>Orthocladius carlatus</i>	F1,S3	<i>Rheocricotopus robacki</i>	F1,S2,S3
<i>Orthocladius clarkei</i>	F4	<i>Rheocricotopus tuberculatus</i>	F4,S2
<i>Orthocladius curtiseta</i> gr.	F1	<i>Rheocricotopus</i> sp. 1	S2
<i>Orthocladius nr. dentifer</i>	S3	<i>Rheocricotopus</i> sp. 2	S2
<i>Orthocladius dorenus</i>	F1,F4,S2	<i>Rheosmittia</i>	F1,F4,S2
<i>Orthocladius lignicola</i>	S2	<i>Smittia</i>	C1,F1,F5,S1,S2
<i>Orthocladius mallochii</i>	F4	<i>Stilocladius</i>	F1,F4
<i>Orthocladius nigrinus</i> gr.	F1	<i>Stilocladius clinoptecten</i>	S1
<i>Orthocladius obumbratus</i>	F1,F4,S2,S3	<i>Symbiocladius</i>	S2
<i>Orthocladius thienemanni</i>	S2	<i>Synorthocladius</i>	C1,F1,F4,F6,S1,S4
<i>Parachaetocladius</i>	F1,F4,F6,S1,S2,S3,S4	<i>Synorthocladius semivirens</i>	F5,S2
<i>Parachaetocladius hudsoni</i>	S2,S3	<i>Synorthocladius nr. semivirens</i>	S3
<i>Paracladius</i>	F1	<i>Thienemannia</i>	S1
<i>Paracricotopus</i>	F1,S2	<i>Thienemanniella</i>	C1,F1,F4,F5,F6,S1,S2
<i>Parakiefferiella</i>	F1,S1,S2,S4	<i>Thienemanniella fusca</i>	S3
<i>Parakiefferiella coronata</i>	S2	<i>Thienemanniella xena</i>	S2,S3
<i>Parakiefferiella</i> sp. 1	S2	<i>Thienemanniella</i> sp. 2	S2
<i>Paralimnophyes</i>	S3	<i>Tvetenia</i>	F1,F5,F6,S1,S2
<i>Parametricnemus</i>	C1,F1,F4,F5,F6,S1,S2, S4	<i>Tvetenia bavarica</i>	F4,F6,S2
<i>Parametricnemus graminicola</i>	S2	<i>Tvetenia bavarica</i> gr.	F1,S3
		<i>Tvetenia discoloripes</i>	S2
		<i>Tvetenia discoloripes</i> gr.	F1
		<i>Tvetenia vitracies</i>	F6,S2,S3

Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Unniella</i>	S2,S3	<i>Microtendipes</i>	C1,F1,F5,F6,S2,S4
<i>Unniella multivirga</i>	S2	<i>Microtendipes caducus</i>	S2
<i>Xylotopus</i>	S2	<i>Microtendipes pedellus</i>	F4,F6,S1,S2
<i>Xylotopus par</i>	F1,S2	<i>Microtendipes pedellus</i> gr.	F1,S3
<i>Zalutschia</i>	S2	<i>Microtendipes rydalensis</i>	F6
<i>Zalutschia zalutschicola</i>	S2	<i>Microtendipes rydalensis</i> gr.	F1,S3
Chironominae	C2,C3,F1,F5,F6,S4	<i>Microtendipes tarsalis</i>	S2
Chironomini	C3,F1,F5,F6,S4	<i>Nilothauma</i>	C1,F1,F6,S3,S4
<i>Chironomus</i>	C1,F1,F5,F6,S2,S3,S4	<i>Nilothauma babilii</i>	S2
<i>Chironomus decorus</i>	S2	<i>Pagastiella</i>	F1,F6
<i>Chironomus riparius</i>	S2	<i>Pagastiella ostansa</i>	S2
<i>Chironomus tentans</i>	S2	<i>Parachironomus</i>	C1,F5,S2
<i>Cladopelma</i>	F5,F6,S2	<i>Parachironomus abortivus</i>	S2
<i>Cladopelma amachaerus</i>	S2	<i>Parachironomus frequens</i>	S2
<i>Cryptochironomus</i>	C1,F1,F5,F6,S1,S2,S4	<i>Paracladopelma</i>	C1,F1,F5,F6
<i>Cryptochironomus argus</i>	S2	<i>Paralauterborniella nigrohal-</i> <i>terale</i>	F1,F5,S2
<i>Cryptochironomus fulvus</i>	S2	<i>Paratendipes</i>	F1,F4,F5,F6,S1,S2,S4
<i>Cryptochironomus fulvus</i> gr.	S3	<i>Paratendipes albimanus</i>	S2
<i>Cryptochironomus</i> sp. 1	S2	<i>Phaenopsectra</i>	C1,F1,F5,F6,S1,S2
<i>Cryptochironomus</i> sp. 3	S2	<i>Phaenopsectra dyari</i>	F1,S3
<i>Cryptotendipes</i>	F1,F5,S2	<i>Phaenopsectra flavipes</i>	S2
<i>Cryptotendipes emorsus</i>	S2	<i>Phaenopsectra obediens</i>	S2
<i>Cryptotendipes pseudotener</i>	S2	<i>Phaenopsectra obediens</i> gr.	F1
<i>Demicryptochironomus</i>	C3,F1,F6	<i>Phaenopsectra punctipes</i> gr.	F1
<i>Demicryptochironomus vulnera-</i> <i>tus</i>	S2	<i>Phaenopsectra</i> sp. 1	S2
<i>Demicryptochironomus</i> sp. 3	S3	<i>Phaenopsectra</i> sp. 2	S2
<i>Dicrotendipes</i>	C1,F1,F5,F6,S1,S2,S4	<i>Polypedilum</i>	C1,F1,F5,F6,S1,S2,S4
<i>Dicrotendipes fumidus</i>	F1,S2	<i>Polypedilum angulum</i>	F1
<i>Dicrotendipes modestus</i>	S2	<i>Polypedilum aviceps</i>	F1,F4,S3
<i>Dicrotendipes neomodestus</i>	F1,S2,S3	<i>Polypedilum convictum</i> gr.	F1
<i>Dicrotendipes nervosus</i>	S2	<i>Polypedilum digitifer</i>	S3
<i>Einfeldia</i>	F1,S2	<i>Polypedilum fallax</i>	F1,S2
<i>Einfeldia natchitocheae</i>	S2	<i>Polypedilum flavum</i>	S2,S3
<i>Endochironomus</i>	C1,F5,S2	<i>Polypedilum halterale</i>	S2
<i>Endochironomus nigricans</i>	S2	<i>Polypedilum halterale</i> gr.	F1
<i>Endochironomus subtendens</i>	S2,S3	<i>Polypedilum illinoense</i>	F1,F4,S2,S3
<i>Glyptotendipes</i>	C1,F5,S1,S2,S4	<i>Polypedilum laetum</i>	F1,S3
<i>Glyptotendipes lobiferus</i>	S2,S3	<i>Polypedilum ontario</i>	S2
<i>Glyptotendipes senilis</i>	S2	<i>Polypedilum ophioides</i>	S2
<i>Goeldichironomus</i>	C1	<i>Polypedilum scalaenum</i>	S2
<i>Harnischia</i>	S2	<i>Polypedilum scalaenum</i> gr.	F1,S3
<i>Harnischia curtilamellata</i>	S2	<i>Polypedilum tritum</i>	F1,F4,S2
<i>Harnischia</i> sp. 2	S2	<i>Polypedilum</i> sp. C	F1
<i>Hyporhygma</i>	S2	<i>Robackia</i>	F1
<i>Kiefferulus</i>	C1,S2	<i>Robackia demejerei</i>	F6,S2
<i>Lauterborniella</i>	F1	<i>Robackia demejerei</i> gr.	F1
<i>Lauterborniella agrayloides</i>	F1,S2	<i>Saetheria</i>	F1,S2,S3,S4
<i>Lauterborniella varipennis</i>	S2	<i>Saetheria tylus</i>	S1,S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Sergentia</i>	S3	<i>Rheotanytarsus distinctissimus</i>	F1,F6,S2
<i>Stenochironomus</i>	F1,F4,F5,S1,S2,S3	<i>Rheotanytarsus distinctissimus</i>	S3
<i>Stictochironomus</i>	F1,F5,S2	gr.	
<i>Stictochironomus devinctus</i>	S2	<i>Rheotanytarsus exiguus</i>	F6,S2
<i>Stictochironomus flavicingula</i>	F1	<i>Rheotanytarsus exiguus</i> gr.	F1,S2,S3
<i>Stictochironomus marmoreus</i>	F1	<i>Rheotanytarsus pellucidus</i>	S2
<i>Stictochironomus</i> sp. 1	S2	<i>Stempellina</i>	C1,F1,F4,F5,F6,S2
<i>Stictochironomus</i> sp. 2	S2	<i>Stempellina bausei</i> gr.	F1
<i>Tribelos</i>	F1,F5,S2	<i>Stempellina</i> sp. 1	S3
<i>Tribelos jucundus</i>	F1,F4,F6,S2	<i>Stempellinella</i>	F1,F4,F5,S1,S3
<i>Xenochironomus</i>	F6,S2	<i>Sublettea</i>	F1,F6,S2
<i>Xenochironomus xenolabis</i>	F5,S2	<i>Sublettea coffmani</i>	F1,F5,S1,S2,S3
<i>Zavreliella marmorata</i>	S2	<i>Tanytarsus</i>	C1,F1,F4,F5,F6,S1,S2, S4
Pseudochironomini		<i>Tanytarsus confusus</i>	S2,S3
<i>Pseudochironomus</i>	F5,S1,S2,S3	<i>Tanytarsus curticornis</i> gr.	F1
<i>Pseudochironomus fulviventris</i>	S2	<i>Tanytarsus glabrescens</i>	F1,S2
<i>Pseudochironomus prasinatus</i>	S2	<i>Tanytarsus glabrescens</i> gr.	S2,S3
<i>Pseudochironomus richardsoni</i>	S2	<i>Tanytarsus guerlus</i>	S2
Tanytarsini	C3,F1,F5,S4	<i>Tanytarsus guerlus</i> gr.	S2,S3
<i>Cladotanytarsus</i>	F1,F5,F6,S1,S2,S3,S4	<i>Tanytarsus varelus</i>	S2
<i>Cladotanytarsus atridorsum</i>	S2	<i>Tanytarsus</i> sp. 1	F1
<i>Cladotanytarsus dispersopilosus</i>	S2	<i>Tanytarsus</i> sp. 2	F1
<i>Cladotanytarsus mancus</i>	S2	<i>Tanytarsus</i> sp. 4	F1,S2
<i>Cladotanytarsus nr. mancus</i>	S3	<i>Tanytarsus</i> sp. 5	F1,S2
<i>Cladotanytarsus mancus</i> gr.	F1	<i>Tanytarsus</i> sp. 6	F1
<i>Cladotanytarsus van der wulpi</i>	F1,S2	<i>Tanytarsus/Micropsectra</i>	F6
<i>Cladotanytarsus</i> sp. 2	S2	<i>Zavrelia</i>	F6,S2,S4
<i>Cladotanytarsus</i> sp. 3	S2	<i>Zavrelia pentatoma</i>	S2
<i>Cladotanytarsus</i> sp. 4	S3	Culicidae	F5,S2
<i>Constempellina</i>	F1,F4	<i>Aedes</i>	S2
<i>Constempellina brevicosta</i>	S2	<i>Aedes fitchii</i>	S2
<i>Micropsectra</i>	C1,F1,F4,F5,F6,S1,S2, S3,S4	<i>Anopheles</i>	F5,S2
<i>Micropsectra curvicornis</i>	S2	<i>Anopheles punctipennis</i>	S2
<i>Micropsectra nr. curvicornis</i>	S3	<i>Culex</i>	S2
<i>Micropsectra deflecta</i>	S2	Dixidae	C2
<i>Micropsectra nr. deflecta</i>	S3	<i>Dixa</i>	C1,C2,F1,F4,S2,S4
<i>Micropsectra dives</i>	S2,S3	Pachyneuridae	S1
<i>Micropsectra junci</i>	S2	Psychodidae	S2,S3
<i>Micropsectra nigripila</i>	S2	<i>Maruina</i>	S2
<i>Micropsectra polita</i>	S2,S3	<i>Pericoma</i>	S2,S4
<i>Micropsectra</i> sp. 7	S2	<i>Psychoda</i>	C2,F1,S1,S2
<i>Micropsectra</i> sp. E	S2	<i>Psychoda alternata</i>	S2
<i>Neozavrelia</i>	C1,F1	<i>Telmatoscopus</i>	C1,S2
<i>Paratanytarsus</i>	C1,F1,F5,S1,S2,S4	<i>Telmatoscopus albipunctatus</i>	S2
<i>Paratanytarsus dimorphis</i>	S3	Ptychopteridae	
<i>Paratanytarsus dissimilis</i>	S2	<i>Bittacomorpha</i>	S2
<i>Rheotanytarsus</i>	C1,C3,F1,F4,F5,F6,S1, S2,S4	<i>Bittacomorpha clavipes</i>	S2
		<i>Ptychoptera quadrifasciata</i>	S2

Taxonomic name	Agency code	Taxonomic name	Agency code
Simuliidae	C2,F1,F2,F3,F5,S1,S2, S4	<i>Gonomyia</i>	S2
<i>Cnephia</i>	S2	<i>Helius</i>	C1,S2
<i>Cnephia dacotensis</i>	C3,S2	<i>Hesperoconopa</i>	S2
<i>Greniera abdita</i>	S2	<i>Hexatoma</i>	C1,C2,C3,F1,F4,F5,F6, S1,S2,S3,S4
<i>Prosimulium</i>	C1,C3,F1,S1,S2,S4	<i>Hexatoma fultonensis</i>	S2
<i>Prosimulium arvum</i>	C3,F4	<i>Hexatoma megacera</i>	S2
<i>Prosimulium fontanum</i>	C3	<i>Hexatoma spinosa</i>	S2
<i>Prosimulium hirtipes</i>	S2	<i>Limnophila</i>	C3,F1,F6,S2,S4
<i>Prosimulium magnum</i>	C3,S2	<i>Limonia</i>	F1,F4,S1,S2,S4
<i>Prosimulium rhizophorum</i>	C3	<i>Limonia rostrata</i>	S2
<i>Simulium</i>	C1,C2,C3,F1,F3,F5,F6, S1,S2,S3,S4	<i>Lipsothrix</i>	C3,S4
<i>Simulium aureum</i>	S2,S3	<i>Molophilus</i>	F4,S2,S4
<i>Simulium decorum</i>	S2,S3	<i>Molophilus hirtapennis</i>	S1
<i>Simulium fibrinflatum</i>	F5,S3	<i>Ormosia</i>	S1,S2,S4
<i>Simulium gouldingi</i>	S2	<i>Pedicia</i>	C2,C3,F1,F4,S2,S3,S4
<i>Simulium impar</i>	C3	<i>Pilaria</i>	F1,F4,S2
<i>Simulium jenningsi</i>	S2,S3	<i>Pilaria tenuipes</i>	S2
<i>Simulium parnassum</i>	C3	<i>Pseudolimnophila</i>	C3,F1,F4,S1,S2,S4
<i>Simulium pictipes</i>	C3,S2,S3	<i>Rhabdomastix</i>	C3
<i>Simulium tuberosum</i>	C3,S2,S3	<i>Rhipidia</i>	S1
<i>Simulium venustum</i>	C3,S2,S3	BRACHYCERA-ORTHOR- RHAPHA	
<i>Simulium venustum/verecun- dum complex</i>	F1	Athericidae	C2,F2
<i>Simulium vittatum</i>	C3,F4,S2,S3	<i>Atherix</i>	C1,C2,C3,F1,F6,S2,S3, S4
<i>Stegopterna</i>	S4	<i>Atherix lantha</i>	F5
<i>Stegopterna mutata</i>	C3,F4, S2	<i>Atherix variegata</i>	S2
Tanyderidae		<i>Chrysopilus</i>	F4
<i>Protoplasa</i>	F6	Dolichopodidae	C3,S2,S3,S4
Thaumaleidae	F6	<i>Argyra</i>	S2
Tipulidae	C1,C2,F1,F2,F5,F6,S1, S4	<i>Dolichopus</i>	S2
Tipulinae		<i>Hydrophorus</i>	S2
<i>Holorusia</i>	S2	Empididae	C1,C2,C3,F1,F2,F5,F6, S1,S4
<i>Tipula</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Chelifera</i>	C1,F1,F4,F6,S2,S4
<i>Tipula abdominalis</i>	S2	<i>Clinocera</i>	C1,C3,F1,F4,F6,S2,S4
<i>Tipula ignobilis</i>	S2	<i>Clinocera stagnalis</i>	S2
Limoniinae	F1	Hemerodromiinae	F5
<i>Antocha</i>	C1,C2,C3,F1,F3,F4,F5, F6,S1,S2,S3,S4	<i>Hemerodromia</i>	C1,C2,C3,F1,F5,F6,S1, S2,S3,S4
<i>Cryptolabis</i>	C3	<i>Hemerodromia praecatoria</i>	S2
<i>Dactylolabis</i>	S2	<i>Hemerodromia rogatoris</i>	S2
<i>Dicranota</i>	C1,C2,C3,F1,F4,F6,S1, S2,S3,S4	<i>Oreogeton</i>	F1,F4,F6
<i>Elliptera</i>	S2	<i>Rhamphomyia</i>	C2
<i>Erioptera</i>	F4	<i>Wiedemannia</i>	F1,F6,S4
<i>Erioptera chlorophylla</i>	S2	Stratiomyidae	C1,C3,F4,S1
		<i>Nemotelus</i>	S2
		<i>Odontomyia</i>	S2

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Taxonomic name	Agency code	Taxonomic name	Agency code
<i>Stratiomys</i>	C1,S2	Hydrelliinae	
<i>Stratiomys discalis</i>	S2	<i>Hydrellia</i>	S2
Tabanidae	C2,F1,F2,S2,S4	Muscidae	C1,C2,F1
<i>Chrysops</i>	C2,C3,F1,F4,F5,S2,S3, S4	<i>Limnophora</i>	C1,S2
<i>Tabanus</i>	C1,C2,F4,F5,S2	<i>Lispe</i>	S2
BRACHYCERA-CYCLOR-		<i>Lispoides aequifrons</i>	S2
RHAPHA		Phoridae	
Ephydriidae	C1,C2,F6,S2	<i>Diplonevra</i>	S2
<i>Ephydra</i>	S2	Sciomyzidae	
Discomyzinae		<i>Dictya</i>	S2
<i>Psilopa</i>	S2	<i>Tetanocera</i>	S4
Ephydrinae		Syrphidae	C1,F4
<i>Brachydeutera</i>	S2		
<i>Brachydeutera argentata</i>	S2		
<i>Dimecoenia spinosa</i>	S2		
<i>Ephydra</i>	C2,S2		
<i>Scatella</i>	S2		

References Cited

- Adler, P., and Kim, K.C., 1986, The black flies of Pennsylvania (Simuliidae, Diptera) bionomics, taxonomy, and distribution: The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, University Park, Pa., Bull. 856, 88 p.
- Barbour, M.T., Gerritsen, Jeroen, Snyder, B.D., and Stribling, J.B., 1999, Rapid bioassessment protocols for use in streams and wadeable rivers—Periphyton, benthic macroinvertebrates and fish (2nd ed.): Washington, D.C., U.S. Environmental Protection Agency, Office of Water, EPA 841-B-99-002, variously paged.
- Bode, R.W., Novak, M.A., and Abele, L.E., 1993a, Biological stream assessment, Willowemoc Creek, 1993 survey: New York State Department of Environmental Conservation Technical Report, 40 p.
- Bode, R.W., Novak, M.A., and Abele, L.E., 1993b, Biological stream assessment, Beaver Kill, 1993 survey: New York State Department of Environmental Conservation Technical Report, 34 p.
- Bode, R.W., Novak, M.A., and Abele, L.E., 1995a, Biological stream assessment, Willowemoc Creek, 1994 survey: New York State Department of Environmental Conservation Technical Report, 34 p.
- Bode, R.W., Novak, M.A., and Abele, L.E., 1995b, Biological stream assessment, Little Beaver Kill, 1994 survey: New York State Department of Environmental Conservation Technical Report, 35 p.
- Bode, R.W., Novak, M.A., and Abele, L.E., 1995c, Biological stream assessment, Vly Creek, 1995 survey: New York State Department of Environmental Conservation Technical Report, 25 p.
- Bode, R.W., Novak, M.A., Abele, L.E., Heitzman, D.L., and Smith, A.J., 2004, Thirty-year trends in water quality of rivers and streams in New York state based on macroinvertebrate data 1972-2002: New York State Department of Environmental Conservation Report, 384 p.
- Cairns, J., Jr., and Pratt, J.R., 1993, A history of biological monitoring using benthic macroinvertebrates *in* Rosenberg, D.M., and Resh, V.H., (eds.), *Freshwater biomonitoring and benthic macroinvertebrates*: New York, N.Y., Chapman and Hall, p. 10-27.
- Donnelly, Thomas, 2004a, Distribution of North American Odonata, Part I—Aeshnidae, Petaluridae, Gomphidae, Cordulegastridae: *Bulletin of American Odonatology*, v. 7, no. 4, p. 61-90.
- Donnelly, Thomas, 2004b, Distribution of North American Odonata, Part II—Macromiidae, Corduliidae, and Libellulidae: *Bulletin of American Odonatology*, v. 8, no. 1, p. 1-32.
- Donnelly, Thomas, 2004c, Distribution of North American Odonata, Part III—Calopterygidae, Lestidae, Coenagrionidae, Protoneuridae, Platystictidae, with data sources and bibliography, Parts I–III: *Bulletin of American Odonatology*, v. 8, no. 2-3, p. 33-99.
- Epler, J.H., 1995, Identification manual for the larval Chironomidae (Diptera) of Florida: Orlando, Fla., Florida Department of Environmental Regulation, 302 p.
- Epler, J.H., 1996, Identification manual for the water beetles of Florida (Coleoptera: Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Hydraenidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae, Scirtidae): Tallahassee, Fla., Florida Department of Environmental Protection.
- Epler, J.H., 2001, Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. jhepler@concentric.net
- Fischer, J.M., Riva-Murray, Karen, Hickman, R.E., Chichester, D.C., Brightbill, R.A., Romanok, K.M., and Bilger, M.D., 2004, Water quality in the Delaware River Basin, Pennsylvania, New Jersey, New York, and Delaware, 1998-2001: U.S. Geological Survey Circular 1227, 38 p.
- Hynes, H.B.N., 1960, *The biology of polluted waters*: Liverpool, England, Liverpool University Press, 199 p.
- Hynes, H.B.N., 1970, *The biology of running waters*: Toronto, Canada, University of Toronto Press, 555 p.
- Kathman, R.D., and Brinkhurst, R.O., 1998, *Guide to the freshwater oligochaetes of North America*: College Grove, Tenn., Aquatic Resources Center, 264 p.
- Kennen, J.G., 1999, Relation of macroinvertebrate community impairment to catchment characteristics in New Jersey streams: *Journal of the American Water Resources Association*, v. 35, no. 4, p. 939-955.
- Klemm, D.J., and Lazorchak, J.M., eds., 1994, *Environmental and assessment program—Surface water and Region 3 regional environmental monitoring and assessment program 1994—Pilot field operation and methods manual for streams*: Cincinnati, Ohio, U.S. Environmental Protection Agency, Environmental Monitoring Systems Lab, Office of Research and Development, EPA/620/R-94/004.
- Kolkwitz, R., and Marsson, M., 1908, *Okologie der pflanzlichen Saprobien*. *Berichte der Deutschen Botanischen Gesellschaft* 26A: p. 505-519.
- Kolkwitz, R., and Marsson, M., 1909, *Okologie der tierischen Saprobien*. *Beitrage zur Lehre von des bioloischen Gewasserbeurteilung*. *Internationale Revue der Gesamten Hydrobiologie und Hydrographie* 2, p. 126-152.
- Kosztarab, M., and Schaefer, C.W., eds., 1990, *Systematics of North American insects and arachnids—Status and needs*: Blacksburg, Va., Information Series 90-1, VA Agric. Exp. Sta., VA Polytechnic Institute and State University.
- Kurtenbach, J., 1991, A method for rapid bioassessment of streams in New Jersey using benthic macroinvertebrates: *Bulletin of the North American Benthological Society*, v. 8, no. 1, p. 129.
- Lawrence, G.B., Burns, D.A., Murdoch, P.S., Baldigo, B., and Baevsky, Y.H., 1994, *Workplan of the Neversink watershed study in the Catskill Mountains of southeastern New York*: U.S. Geological Survey Open-File Report 94-368, 42 p.

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- Lellis, W.A., 2001, Freshwater mussel survey of the Upper Delaware Scenic Recreational River—Qualitative survey 2000, Report to the National Park Service, February 20, 2001: Wellsboro, Pa., U.S. Geological Survey, 57 p.
- Masteller, E.C., Lee, S., Simons, J., and Magee, D., 2004, Searchable database of the caddisflies and stoneflies of Pennsylvania: Pennsylvania Sea Grant, accessed Jan. 31, 2004, at <http://www.pserie.psu.edu/seagrant/extension/other/database.html>
- Masteller, E.C., and Flint, O.S., Jr., 1992, The Trichoptera (caddisflies) of Pennsylvania—An annotated checklist: *Journal of Pennsylvania Academy of Science* 66(2): 68-78.
- McCafferty, W.P., 2000, Higher classification of the Ephemeroptera: Mayfly Central, Purdue University, Department of Entomology, accessed Jan. 31, 2004, at <http://www.entm.purdue.edu/entomology/mayfly/>.
- Merritt, R.W., and Cummins, K.W., 1996, An introduction to the aquatic insects of North America (3d ed.): Dubuque, Iowa, Kendall/Hunt Publishing Company, 862 p.
- Monroe County Planning Commission, 1990, Water quality study, 1990: Stroudsburg, Pa., Monroe County Planning Commission Report, 50 p.
- Monroe County Planning Commission, 1991, Water quality study, 1991: Stroudsburg, Pa., Monroe County Planning Commission Report, 47 p.
- Monroe County Planning Commission. 1992. Water Quality Study, 1992: Stroudsburg, Pa., Monroe County Planning Commission Report, 54 p.
- Monroe County Planning Commission, 1993, Water Quality Study, 1993: Stroudsburg, Pa., Monroe County Planning Commission Report, 84 p.
- Monroe County Planning Commission, 1994, Water Quality Study, 1994: Stroudsburg, Pa., Monroe County Planning Commission Report, 93 p.
- Monroe County Planning Commission, 1995, Water Quality Study, 1995: Stroudsburg, Pa., Monroe County Planning Commission Report, 95 p.
- Monroe County Planning Commission, 1996, Water Quality Study, 1996: Stroudsburg, Pa., Monroe County Planning Commission Report, 101 p.
- Monroe County Planning Commission, 1997, Water Quality Study, 1997: Stroudsburg, Pa., Monroe County Planning Commission Report, 100 p.
- Monroe County Planning Commission, 1998, Water Quality Study, 1998: Stroudsburg, Pa., Monroe County Planning Commission Report, 104 p.
- Monroe County Planning Commission, 1999, Water Quality Study, 1999: Stroudsburg, Pa., Monroe County Planning Commission Report, 75 p.
- Monroe County Planning Commission, 2000, Water Quality Study, 2000: Stroudsburg, Pa., Monroe County Planning Commission Report, 82 p.
- New Jersey Department of Environmental Protection, 1994a, Ambient biomonitoring network—Delaware River drainage basin, 1992 benthic macroinvertebrate data: New Jersey Department of Environmental Protection Report, 206 p.
- New Jersey Department of Environmental Protection, 1994b, The establishment of ecoregion biological reference sites for New Jersey streams—Incorporating habitat quality and benthic macroinvertebrate communities, 1989-1993 monitoring data: New Jersey Department of Environmental Protection Report, 114 p.
- New Jersey Department of Environmental Protection. 1996. Ambient biomonitoring network—Lower Delaware River drainage basin, 1995-96 benthic macroinvertebrate data: New Jersey Department of Environmental Protection Report, 133 p.
- New Jersey Department of Environmental Protection, 1999a, Ambient biomonitoring network—Watershed management areas 1, 2, and 11—Upper Delaware region, 1998 benthic macroinvertebrate data: New Jersey Department of Environmental Protection Report, 171 p.
- New Jersey Department of Environmental Protection, 1999b, Ambient biomonitoring network—Watershed management areas 19 and 20, Delaware Region, upper tidal portion, 1998 benthic macroinvertebrate data: New Jersey Department of Environmental Protection Report, 113 p.
- New York State Department of Environmental Conservation, 1996, The Delaware River Drainage Basin Biennial Report, 1993-94: New York State Department of Environmental Conservation Technical Report, 102 p. + appendixes.
- Omerick, J.M., 1987, Ecoregions of the conterminous United States: *Annals of the Association of American Geographers* v. 77, no. 1, p. 118-125.
- Passmore, M., and Green, J., 1997, The development of a stream reference condition in Monroe County, Pennsylvania: U.S. Environmental Protection Agency, Ecological Assessment and Protection Division Report, 61 p.
- Pike County Conservation District, 1991, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 81 p.
- Pike County Conservation District, 1992, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 110 p.
- Pike County Conservation District, 1993, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 104 p.
- Pike County Conservation District, 1994, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report., 117 p.
- Pike County Conservation District, 1995, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 142 p.
- Pike County Conservation District, 1996, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 138 p.
- Pike County Conservation District, 1997, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report.
- Pike County Conservation District, 1998, Annual Report, surface water quality monitoring program: Hawley, Pa., Pike County Conservation District Report, 136 p.

- Pike County Conservation District, 1999, Environmental quality of Pike County streams using bioassessment techniques: Hawley, Pa., Pike County Conservation District Report, 55 p.
- Pike County Conservation District, 2000, Environmental quality of Pike County streams using bioassessment techniques: Hawley, Pa., Pike County Conservation District Report, 56 p.
- Plafkin, J.L., Barbour, M.T., Porter, K.D., Gross, S.K., and Hughes, R.M., 1989, Rapid bioassessment protocols for use in streams and rivers—Benthic macroinvertebrates and fish: Washington, D.C., U.S. Environmental Protection Agency, Office of Water, EPA/444/4-89-001, variously paged.
- Rawlins, J.E., and Bier, C.W., 1998, Invertebrates—Review of status in Pennsylvania, *in* Hassinger, J.D., Hill, R.J., Storm, G.L., and Yahner, R.H., eds., Inventory and monitoring of biotic resources in Pennsylvania—Current ecological and landscape topic, Vol. 1., Pennsylvania Biological Survey: University Park, Pa., The Pennsylvania State University, Center for Biodiversity Research, 220 p.
- Reif, A.G., 1999, Physical, chemical, and biological data for selected streams in Chester County, Pennsylvania, 1981-94: U.S. Geological Survey Open-File Report 99-216, 607 p.
- Reif, A.G., 2000, Physical, chemical, and biological data for selected streams in Chester County, Pennsylvania, 1995-97: U.S. Geological Survey Open-File Report 00-238, 147 p.
- Shertzler, R.H., and Schreffler, T.L., 1996, Pennsylvania's surface water quality monitoring network: Harrisburg, Pa., Pennsylvania Department of Environmental Protection, Report No. 3600-BK-DEP0636.
- Smith, D.G., 2001, Pennak's freshwater invertebrates of the United States—Porifera to Crustacea: New York, John Wiley and Sons, Inc., 638 p.
- Smith, I.M., and Cook, D.R., 1991, Water mites, *in* Thorp, J.H., and A.P. Covich, A.P., eds., Ecology and classification of North American freshwater invertebrates: San Diego, Calif., Academic Press, Inc., p. 523-592.
- Snyder, C., Young, J., Smith, D., Ross, R., and Bennett, R., 1999, Influence of eastern hemlock on aquatic biodiversity in the Delaware Water Gap National Recreation Area: Kearneysville, W.Va., U.S. Geological Survey, Leetown Science Center.
- Stewart, K.W., and Stark, B.P., 2002, Nymphs of North American Stonefly Genera (Plecoptera) (2d ed.): Columbus, Ohio, The Caddis Press, 510 p.
- Strayer, D.L., and Jirka, K.J., 1997, The pearly mussels of New York State: New York State Museum Memoir 26: 1-113.
- Thorp, J.H., and Covich, A.P., 1991, Ecology and classification of North American freshwater invertebrates: San Diego, Calif., Academic Press, Inc., 911 p.
- Thorp, J.H., and Covich, A.P., 2001, Ecology and classification of North American freshwater invertebrates (2d ed.): San Diego, Calif., Academic Press, Inc., 1056 p.
- U.S. Environmental Protection Agency, 1994, Guidance on implementation of biological criteria—Draft: Washington, D.C., U.S. Environmental Protection Agency, Office of Science and Technology.
- U.S. Environmental Protection Agency, 1999, Level III Ecoregions of the Conterminous United States (revision of Omernick 1987): Corvallis, Oreg., U.S. Environmental Protection Agency, National Health and Environmental Effects Laboratory, Western Ecology Division.
- U.S. Environmental Protection Agency, 2000, Environmental monitoring and Assessment Program EMAP: accessed November 2001 at <http://www.epa.gov/emap>
- Vogelmann, J.E., Sohl, T., and Howard, S.M., 1998, Regional characterization of land cover using multiple sources of data: Photogrammetric Engineering and Remote Sensing, v. 64, no. 1, p. 45-57.
- Wetzel, M.J., 2001, The aquatic Annelida occurring in or adjacent to the Great Smokey Mountains National Park—An annotated checklist of species: Champaign, Ill., Illinois Natural History Survey, Center for Biodiversity.
- Wiggins, G.B., 1995, Larvae of the North American caddisfly genera (Trichoptera) (2d ed.): Toronto, Canada, University of Toronto Press, 457 p.
- Wilson, E.O., 1984, Biophilia: Cambridge, Mass., Harvard University Press, 111 p.
- Wilson, E.O., ed., 1988, Biodiversity: Washington, D.C., National Academy Press, 621 p.
- Wilson, E.O., 2000, A global biodiversity map: Science, v. 289, p. 2279.
- Young, C., and Gelhaus, J., 2000, Crane flies of Pennsylvania—Preliminary checklist and database development with emphasis on aquatic species: Report to the Wild Resources Conservation Fund and the Pennsylvania Fish and Boat Commission, 256 p.