PROJECT SEARCH

Family-Level Identification Guide for Riffle-Dwelling Macroinvertebrates of Connecticut

Sixth Edition
Spring 2009

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Authors and Acknowledgements
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Available Online……. www.projectsearch.org

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About the Key

Scope of the Key

This key was developed to assist Project Search participants in the identification of aquatic benthic macroinvertebrates. As such, it is targeted toward organisms that are most commonly found in the riffle microhabitats of Connecticut streams. There may be an organism collected at a Project Search site that will not be found in this key. In this case, you should utilize another reference guide to identify the organism. Several useful guides are listed below.

AQUATIC ENTOMOLOGY *by Patrick McCafferty*
A GUIDE TO COMMON FRESHWATER INVERTEBRATES OF NORTH AMERICA *by J. Reese Voshell, Jr.*
AN INTRODUCTION TO THE AQUATIC INSECTS OF NORTH AMERICA *by R.W. Merritt and K.W. Cummins*

Most organisms will be keyed to the family level, however several will not be identified beyond the phylum, class, or order. Table 1 (to the right) shows an example of the taxonomy of one of these families, the *Heptageniidae*. Within this family, there are several different genera and within each genus are several species. Because of this, two organisms may be keyed to the same family while having minor anatomical differences between them.

Some of the anatomical features described in this key will be visible to the naked eye or by the use of a hand lens, however it will be necessary to use a dissecting microscope to identify many of the smaller characteristics.

Kingdom	*Animalia*
Phylum	*Arthropoda*
Class	*Insecta*
Order	*Ephemeroptera*
Family	***Heptageniidae***
Genus	----------
Species	----------

Table 1: Taxonomy of Heptageniidae

Using the Key

To identify an organism, always begin with question #1 to select the body type that best describes your organism. The response you select will lead you to another question, which will ask about another defining characteristic of your organism. Sketches are included alongside each question to help you decide. When you have answered enough questions about your organism, you will reach your last question which will reveal the organism's scientific family name and a number in the "Macroinvertebrate Descriptions" section at the end of the guide at which to access detailed information about the organism. Also, below the scientific name will be a brief description of the organism appearing within brackets. This will include the common name, the pollution tolerance value, and the probability of finding the organism in your sample, as shown below.

[Common Name / Pollution Tolerance Value / Probability of Finding this Organism]

The pollution tolerance value is on a scale from 0 to 10, with 0 being extremely sensitive to pollution and 10 being extremely tolerant of pollution. The probability of finding the organism will be considered either 'Rare', 'Occasional', 'Likely', or 'Probable'. This may help you determine if you have identified the organism correctly based on its commonality. An 'X' will replace one of these characteristics if no information is available.

Glossary of Anatomical Terms

This brief glossary will explain the anatomical terms presented in the key and will assist you in confidently answering the questions presented. Figures 1 and 2 visually demonstrate some of the typical characteristics of insect larvae that are defined below.

Abdomen: The third body segment. It is divided into many small sections, 8-10 in most insects. To number the abdominal sections, start with #1 directly behind the last pair of legs and count each section up to 10. At the end of the abdomen can be either long *tails (cerci)*, *prolegs*, *toes/claws*, *gills*, or tufts of hairs. Additionally, *gills* are often located along the edges of the abdominal sections.

Antennae: Extensions from the top (dorsal) side of the *head*. Usually thin but can be wider at the top. These consist of sections which may be important for identification.

Gills: Rounded or fringed structures extending from the organism's body. These can be located on the *abdominal* segments, underneath each pair of legs on the *thoracic* segments, or at the end of the *abdomen*. Gills allow aquatic organisms to take in oxygen and expel carbon dioxide underwater.

Hardened plates: Armor-like plates covering the top (dorsal) side of an organism's *head*, *thorax*, or *abdomen*. The number and location of these plates is important in identifying Trichoptera (Caddisfly) larvae. Coleoptera (Beetle) larvae are generally covered entirely by hardened plates. In order to count a thoracic segment as having a hardened plate, the plate must cover more than half of the segment.

Head: The first segment of the body. This contains the eyes, *antennae*, and mouthparts.

Prolegs: Short unsegmented leg-like structures found at the end of the *abdomen* or on the underside (ventral side) of a *thoracic* or *abdominal* section.

Segment (or Section): A distinct part of an organism or an organism's body part. Notice the numbered segments on Figures 1 and 2.

Segmented: A structure consisting of more than one piece. This may refer to legs, *thorax*, *abdomen*, *antennae*, or the entire body.

Tails (Cerci): Long, thin extensions from the end of the *abdomen*.

Thorax: The second, or middle, body segment. It is divided into three sections. Each section usually has a pair of *segmented legs* attached. On some insect larvae, this is also where the *wing pads* will be found.

Toes (Claws, Hooks): The last segment of the leg. There may be just one toe or two toes of equal length.

Wing pads: Flat, oblong, oval structures found on the back of the second and third sections of the *thorax*. The shape Is similar to that of a human tooth. These are areas where wings are developing. These are only found on organisms that experience incomplete metamorphosis (ex. Ephemeroptera (Mayflies), Plecoptera (Stoneflies), Odonata (Dragon/Damselflies).

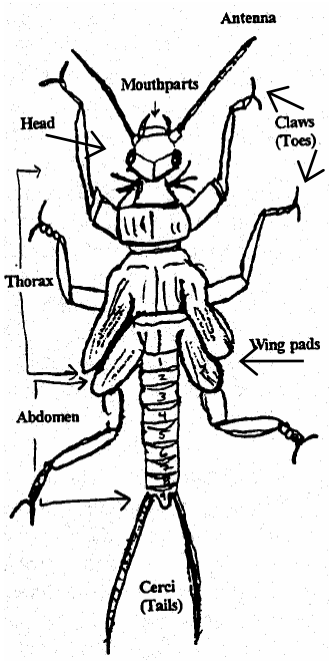


Figure 1: Plecoptera (Stonefly) Larva

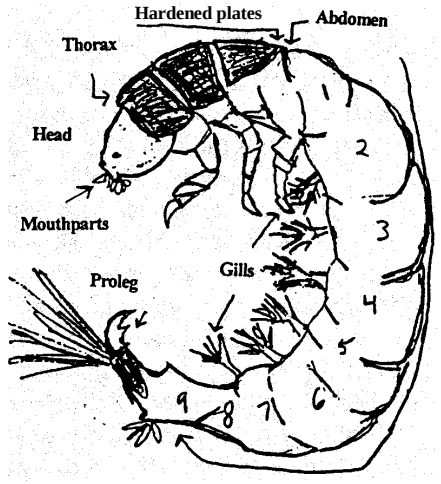
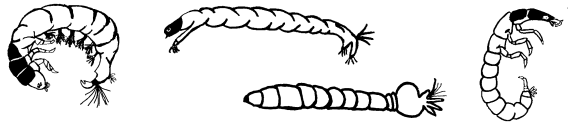
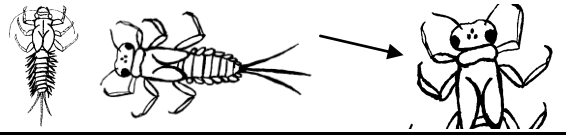
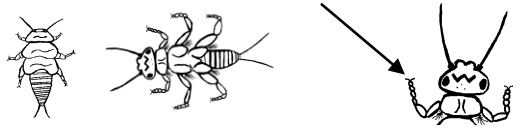
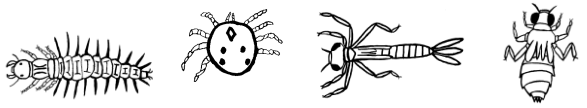
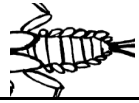
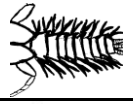
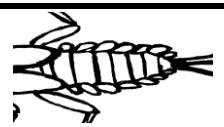
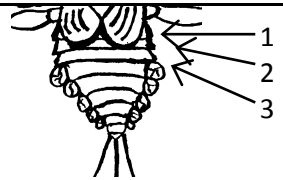
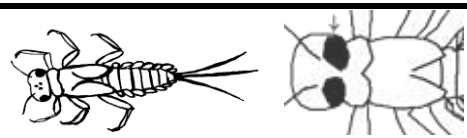


Figure 2: Trichoptera (Caddisfly) Larva

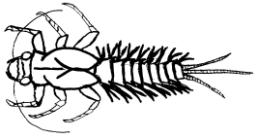
#	Questions	Option	Examples
1	Which body type does the organism have?	**a.** Flattened (NOT cylindrical or worm-like), with large segmented legs ……. Go to #2	
		b. Cylindrical, fleshy or worm-like, and may or may not have legs or tails ……. Go to #32	
		c. Round, triangular, or another shape ……. Go to #53	
		d. Body is inside of stick or stone case/shelter ……. Go to #55	
2	The organism has a flattened (not cylindrical) body, longer than it is wide, with large segmented legs **AND**	a. 2-3 long <u>*hair-like*</u> tails, with 1 hook/toe at the end of each leg ……. Go to #3	
		b. 2 long <u>*hair-like*</u> tails, with 2 hooks/toes at the end of each leg ……. Go to #11	
		c. Any of the following: No tails; 1 hair-like tail; Wide, paddle-like tails; or Hooks at the end of the body ……. Go to #19	
3	What shape are the gills?	Round or oval…….Go to #4	
		Fringed or forked…….Go to #8	
		Large and square……. ***Caenidae*** (Go to #78) [Small Squaregill Mayfly/7/Rare]	
		Gills are covered with armor plating……. ***Baetiscidae*** (Go to # 77) [Armored Mayfly/3/Rare]	

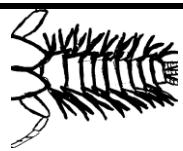
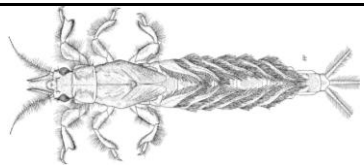
4	On what section of the abdomen do the gills start?	First or second section……. Go to #5	
		Third section……. ***Ephemerellidae*** (Go to #79) [Spiny Crawler Mayfly/1/Likely]	

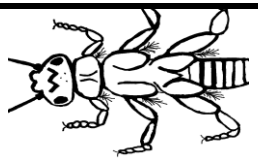
5	Are the front legs covered in dense *long* hair?	Yes……. ***Isonychiidae*** (Go to #82) [Brushlegged Mayfly/2/Probable]	
		No……. Go to #6	

6	Does the organism have a wide, flat head the same width as the rest of the body with very large eyes?	Yes……. ***Heptageniidae*** (Go to #81) [Flat-Headed Mayfly/4/Probable]	
		No……. Go to #7	

7	How long are the antennae?	Shorter than ½ the body's length ……. ***Siphloneuridae*** (Go to #85) [Primitive Minnow Mayfly/7/Occasional]	
		Longer than ½ the body's length ……. ***Baetidae*** (Go to #76) [Small Minnow Mayfly/4/Likely]	

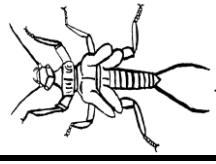
8	Does the organism have large tusks stemming from its mouth?	Yes……. Go to #10	
		No……. ***Leptophlebiidae*** (Go to #83) [Prong-Gill Mayfly/2/Occasional]	

10	Where do the gills lie on the organism's body?	The gills project from the side of the body……. ***Potamanthidae*** (Go to #84) [Hackle-Gill Mayfly/4/Occasional]	
		The gills curve up around the top of the body……. ***Ephemeridae*** (Go to #80) [Common Burrower Mayfly/4/Rare]	

11	Does the organism have a tuft of fluffy gills at the base of each leg?	Yes…….Go to #12	
		No…….Go to #13	

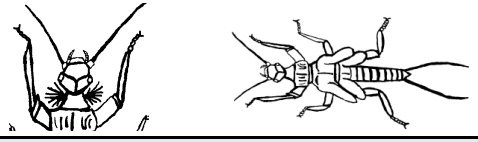
12	Is the organism jet-black?	Yes……. ***Pteronarcyidae*** (Go to #102) [Giant Stonefly/0/Occasional]	
		No……. ***Perlidae*** (Go to #100) [Common Stonefly/1/Probable]	

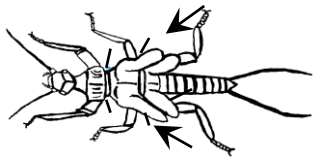
13	Is the organism tear-drop shaped and roach-like?	Yes……. ***Peltoperlidae*** (Go to #99) [Roach-like Stonefly/0/Occasional]	
		No……. Go to #14	

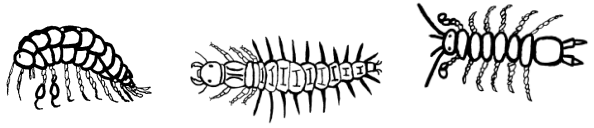
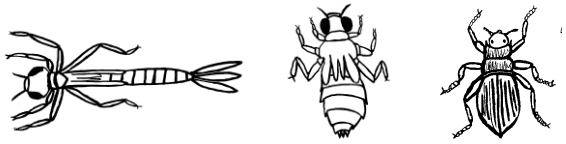
14	Are the wing pads parallel to the body of the organism?	Yes……. Go to #15	 Parallel to this line
		No……. Go to #17	 Points away from this line

15	Is the first pair of wing pads elongated and overlap the second pair?	Yes……. Go to #16	
		No……. ***Chloroperlidae*** (Go to #96) [Green Stonefly/1/Likely]	

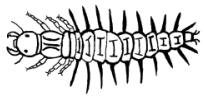
16	Does the abdomen appear zig-zagged or jagged from the top?	Yes……. ***Capniidae*** (Go to #95) [Slender Winter Stonefly/1/Rare]	Jagged abdominal edges 
		No……. ***Leuctridae*** (Go to #97) [Rolled-Winged Stonefly/0/Likely]	Smooth abdominal segments 

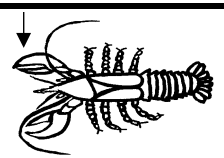
17	Does the organism have a tuft of fluffy gills on the underside of the throat?	Yes……. ***Nemouridae*** (Go to #98) Nemourid Broadback Stonefly/2/Occasional]	
		No……. Go to #18	

18	Does the organism have one finger-like gill projecting from the body underneath each leg? <u>(Flip the organism on its back to see the gill on the underside.)</u>	Yes……. ***Taeniopterygidae*** (Go to #103) [Winter Stonefly/2/Rare]	
		No……. ***Perlodidae*** (Go to # 101) [Perlodid Stonefly/2/Occasional]	

19	How many legs does the organism have?	Looks like more than 8 legs……. Go to #20	
		8 legs……. ***Aracnida*** Class (Go to #127) [Spider/4/Occasional]	
		6 legs……. Go to #24	

20	Are there two spine-like structures on each section of the abdomen, similar to porcupine quills?	Yes……. Go to #21	
		No……. Go to #22	

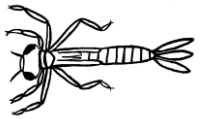
21	Does the organism have a single long thin tail?	Yes……. ***Sialidae*** (Go to #87) [Alderfly/4/Rare]	
		No……. ***Corydalidae*** (Go to #86) [Dobsonfly/5/Probable]	

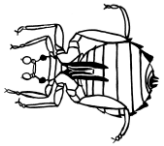
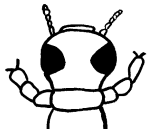
22	Does the organism have large pinching claws and look like a small lobster?	Yes……. ***Decapoda*** Order(Go to #119) [Freshwater Crayfish/6/Likely]	
		No……. Go to #23	

23	What color is the organism?	Orange, white, or light colored……. ***Amphipoda*** Order (Go to #118) [Scud or Sideswimmer/6/Probable]	
		Grey or darker colored…….. ***Isopoda*** Order (Go to #120) [Freshwater Sowbug/8/Occasional]	

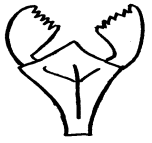
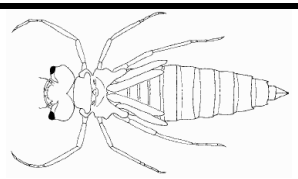
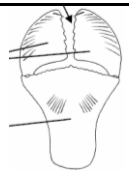
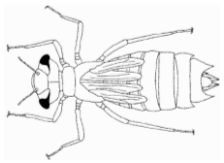
24	Does the organism look like a beetle?	Yes……. Go to #25	
		No……. Go to #26	

25	Does the beetle have antennae?	Yes……. ***Elmidae*** (Go to #65) [Riffle Beetle/4/Probable]	 
		No……. ***Dryopidae*** (Go to #64) [Long-Toed Water Beetle/5/Rare]	

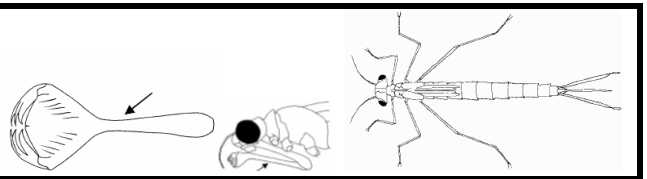
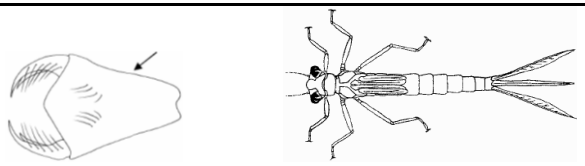
26	What does the tail-end of the organism look like?	Several small triangular points……. Go to #27	 
		Large feathery gills……. Go to #30	 

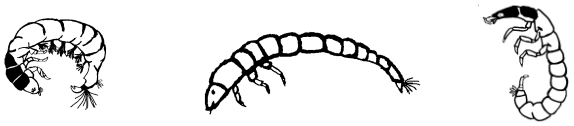
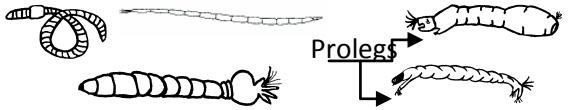
27	Are the antennae more bulbous like the end of a q-tip or thin like a thread?	Q-tip……. ***Gomphidae*** (Go to #92) [Club-Tail Dragonfly/1/Probable]	 
		Thin thread……. Go to #28	

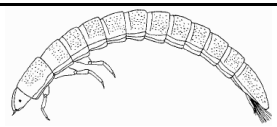
28	Is the lower lip flat or spoon-shaped? <u>(This is best seen from a side-view.)</u>	Flat……. ***Aeshnidae*** (Go to #88) [Darner Dragonfly/3/Probable]	
		Spoon-shaped……. Go to #29	

29	Does the lower lip have many deep jagged indentations? <u>(This is best seen from the underside of the body.)</u>	Yes……. ***Cordulergastridae*** (Go to #91) [Biddie Dragonfly/3/Occasional]	 
		No, but may have slight rounded indentations……. ***Libellulidae*** (Go to #94) [Common Skimmer Dragonfly/9/Rare]	 

30	Is the first section of the antennae much longer than the others?	Yes……. ***Calopterygidae*** (Go to #89) [Broad-Winged Damselfly/5/Occasional]	
		No……. Go to #31	

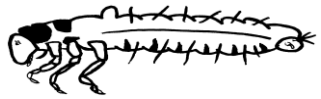
31	Is the lower lip on a long thing stalk?	Yes……. ***Lestidae*** (Go to #93) [Spread-Winged Damselfly/9/Rare]	
		No……. ***Coenagrionidae*** (Go to #90) [Narrow-Winged Damselfly/9/Likely]	

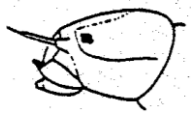
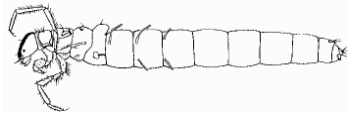
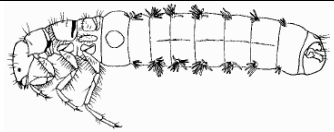
32	The organism is cylindrical, fleshy or worm-like **AND**	**a.** Has segmented legs……. Go to #33	
		b. Does not have segmented legs (May have small prolegs)……. Go to #44	

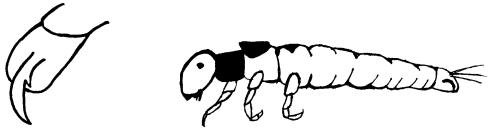
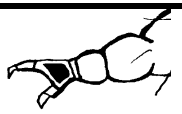
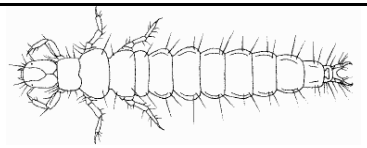
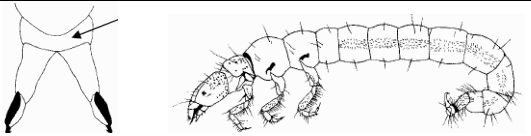
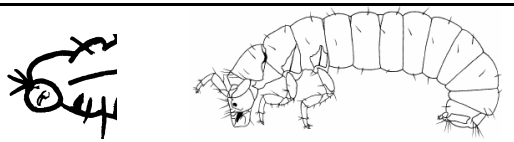
33	How many dark armor-like plates are covering the body of the organism? <u>(Plates should cover more than ½ of each thoracic segment to count.)</u>	3 plates over the thorax……. Go to #34	
		2 plates over the thorax……. Go to # 35	
		1 plate over the thorax……. Go to #39	
		The entire body is covered with armor plates……. Go to #43	

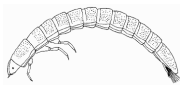
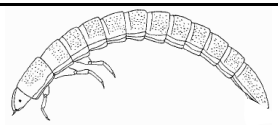
34	Does the organism have tufts of fluffy gills on the underside of the abdomen?	Yes……. ***Hydropsychidae*** (Go to #107) [Common Netspinner Caddisfly/4/Probable]	
		No……. ***Hydroptilidae*** (Go to #108) [Micro Caddisfly/4/Occasional]	

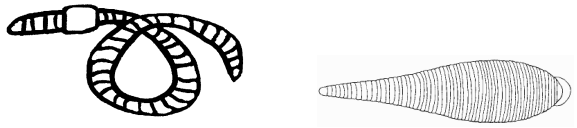
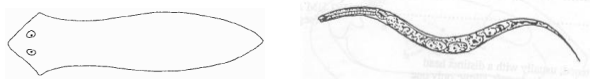
35	Is there a hump on the first abdominal segment?	Yes, on the top and sometimes also on the side……. Go to #36	
		Yes, *only* on the side……. ***Lepidostomatidae*** (Go to #109) [Lepidostomatid Case Maker Caddisfly/1/Rare]	
		No……. Go to #38	

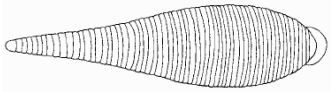
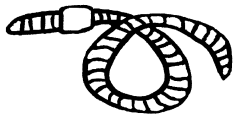
36	Does the organism have a small hook on its throat?	Yes……. ***Limnephilidae*** (Go to #111) [Northern Case Maker Caddisfly/4/Likely]	 
		No……. Go to #37	

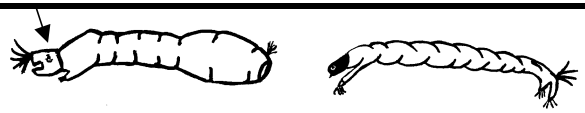
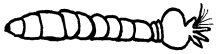
37	Does the organism have antennae?	Yes……. ***Leptoceridae*** (Go to #110) [Long-Horned Case Maker Caddisfly/4/Occasional]	 
		No……. ***Odontoceridae*** (Go to #113) [Strong Case Maker Caddisfly/0/Occasional]	

38	What shape are the claws at the end of the abdomen?	Comb-shaped with many teeth……. ***Helicopsychidae*** (Go to #106) [Snail Case Maker Caddisfly/3/Rare]	
		Hook-shaped with a single point……. ***Brachycentridae*** (Go to #104) [Humpless Case Maker Caddisfly/1/Likely]	
39	Does the organism have a white body with a bright orange head? Does it have a wide t-shaped upper lip?	Yes……. ***Philopotamidae*** (Go to #114) [Finger-Net Caddisfly/3/Probable]	
		No……. Go to #40	
40	Does the organism have a small dark armored plate on the last abdominal segment, just above the v-shaped prolegs?	Yes……. Go to #41	
		No……. Go to #42	
41	Does the organism have a small hook on the underside of its throat?	Yes……. ***Phryganiidae*** (Go to #115) [Giant Case Maker Caddisfly/4/Occasional]	
		No……. ***Rhyacophilidae*** (Go to #117) [Free Living Caddisfly/0/Likely]	
42	Does the end of the abdomen split into 2 V-shaped prolegs or is it more rounded?	2 V-shaped prolegs……. ***Polycentropodidae*** (Go to #116) [Trumpet-Net Caddisfly/6/Occasional]	
		More rounded……. ***Glossosomatidae*** (Go to #105) [Saddle Case Maker Caddisfly/0/Probable]	

43	Does the organism have a small flap at the end of its body on the underside? Does the organism's body end with very small prolegs?	Yes……. ***Elmidae*** (Go to #65) [Riffle Beetle/4/Probable]	
		No……. ***Ptilodactylidae*** (Go to #67) [Ptilodactid Beetle/2/Rare]	

44	How many body segments does the organism have?	20 or more……. Go to #45	
		Less than 20……. Go to #46	
		Unsegmented……. Go to #52	

45	Does the organism have a suction-cup like disc at each end of the body?	Yes……. ***Hirudinea*** Sub-Class (Go to #123) [Leech/10/Rare]	
		No……. ***Oligochaeta*** Sub-Class (Go to #124) [Aquatic Earthworm/8/Likely]	

46	Does the organism have a visible head? (Look for eye spots.)	Yes……. Go to #47	
		No……. Go to #48	

47	Is the organism thicker at one end than in the middle?	Yes……. ***Simuliidae*** (Go to #73) [Black Fly/6/Probable]	
		No……. ***Chironimidae*** (Go to #71) [Midge Fly/6/Probable]	

48	Does the organism have small prolegs along the abdomen?	Yes……. Go to #49	
		No……. Go to #50	

49	Are the tails longer than the last set of prolegs?	Yes……. ***Athericidae*** (Go to #68) [Water Snipe Fly/2/Rare]	
		No……. ***Empididae*** (Go to #72) [Aquatic Dance Fly/6/Rare]	

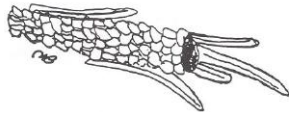
50	Does the organism have tails?	Yes……. ***Tipulidae*** (Go to #75) [Crane Fly/3/Probable]	
		No……. Go to #51	

51	Are there fleshy welts around each abdominal segment?	Yes……. ***Tabanidae*** (Go to #74) [Horse Fly/6/Rare]	
		No……. ***Ceratopogonidae*** (Go to #70) [Biting Midge Fly/6/Likely]	

52	Does the organism have eye spots?	Yes……. ***Turbellaria*** Class (Go to #126) [Planarian/4/Rare]	
		No……. ***Nematoda*** Phylum (Go to #125) [Nematode/5/Occasional]	

53	Is the organism inside of a shell? Does it look like a mollusk? **<u>(Do not attempt to identify broken shells or shells without an organism inside.)</u>**	Yes……. Go to #54	
		No……. ***Psephenidae*** (Go to #66) [Water Penny Beetle/4/Probable]	  A head and tails should be visible on the underside of the organism.

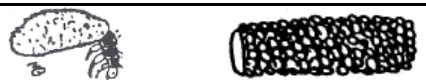
54	How many pieces does the shell consist of? **<u>(Do not attempt to identify broken shells or shells without an organism inside.)</u>**	One……. ***Gastropoda*** Class (Go to #122) [Snail/7/Likely]	
		Two……. ***Bivalvia*** Class (Go to #121) [Freshwater Clam or Mussel/7/Likely]	

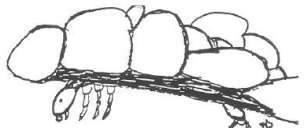
55	What type of material is the case made of? **<u>(Do not attempt to identify cases without an organism inside/attached.)</u>**	Organic material only (sticks, bark, plant fibers, etc)……. Go to #56	
		Inorganic material only (rocks, sand, etc)……. Go to #59	
		Mixture of organic and inorganic material……. Go to #63	

56	Is the case contructed of large chunks of sticks and bark?	Yes……. ***Limnephilidae*** (Go to #111) [Northern Case Maker Caddisfly/4/Likely]	
		No……. Go to #57	

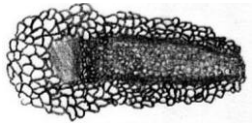
57	What does the opening of the case look like?	Square opening, constructed with small blocks ……. ***Lepidostomatidae*** (Go to #109) [Lepidostomatid Case Maker Caddisfly/1/Rare]	
		Round opening, constructed with strips of wrapped material……. Go to #58	

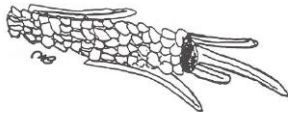
58	How are the organic material assembled on the case?	Thin strips of bark……. ***Brachycentridae*** (Go to #104) [Humpless Case Maker Caddisfly/1/Likely]	
		Tightly wrapped and tapered leaves and/or bark……. ***Leptoceridae*** (Go to #110) [Long-Horned Case Maker Caddisfly/4/Occasional]	
		Other description……. The case is not distinctive enough to identify with this key.	

59	Is the case constructed using pebbles or grains of sand?	Pebbles……. Go to #60	
		Grains of sand……. Go to #61	

60	How are the pebbles assembled on the case?	15-20 small pebbles, flat on the bottom and rounded on the top like a turtle shell……. ***Glossosomatidae*** (Go to #105) [Saddle Case Maker Caddisfly/0/Probable]	
		2-3 larger pebbles on each side with smaller stones in the center……. ***Limnephilidae*** (Go to #111) [Northern Case Maker Caddisfly/4/Likely]	
		Other description……. The case is not distinctive enough to identify with this key.	

61	Is the case shaped like a tiny snail shell?	Yes……. ***Helicopsychidae*** (Go to #106) [Snail Case Maker Caddisfly/3/Rare]	
		No……. Go to #62	

62	How are the grains of sand assembled on the case?	Very small oval case, compressed like an envelope over the rear of the organism……. ***Hydroptilidae*** (Go to #108) [Micro Caddisfly/4/Occasional]	
		Very tightly packed transparent grains……. ***Odontoceridae*** (Go to #113) [Strong Case Maker Caddisfly/0/Occasional]	
		A hood stretches over the opening of the case……. ***Molannidae*** (Go to #112) [Hoodcase Maker Caddisfly/6/Rare]	
		Other description……. The case is not distinctive enough to identify with this key.	

63	Does the case have coniferous needles or other long thin organic material attached to the sides?	Yes……. ***Limnephilidae*** (Go to #111) [Northern Case Maker Caddisfly/4/Likely]	
		No……. The case is not distinctive enough to identify with this key.	

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Macroinvertebrate Descriptions

INSECTA Class

Coleoptera Order
Common Name: Aquatic Beetles

64 Family: Dryopidae — Common Name: Long-toed Water Beetle
Pollution tolerance: 5 (moderate) — Probability: Rare
Feeding group: Scraper — Type of stream: Moderate flows, low to medium gradient
Location in stream: Under rocks and organic substrates — Location in key: #25
Trivia: These beetles resemble the adult riffle beetles, however they are much larger (about twice the size). They are not collected very frequently. The existence of antennae differentiate this organism from Elmidae, however they are sometimes difficult to see because they are shortened. This family is unique in that the larval stage is terrestrial and the adult stage is aquatic.

65 Family: Elmidae — Common Name: Riffle Beetle
Pollution tolerance: 4 (moderate) — Probability: Probable
Feeding group: Scraper — Type of stream: Moderate to fast flows
Location in stream: On organic substrates in riffle areas — Location in key: #25 (adult); #43 (larva)
Trivia: These are small (4-10 mm) brown arc-shaped larvae. This is one of very few organisms who remain aquatic in both its larval and adult stages.

66 Family: Psephenidae — Common Name: Water Penny Beetle
Pollution tolerance: 4 (moderate) — Probability: Probable
Feeding group: Scraper — Type of stream: Fast flows
Location in stream: Attached to rocks — Location in key: #53
Trivia: The water penny larvae are flattened oval shaped organisms. They are well adapted to scrape microscopic algae off of the surface of rocks in fast current. The head, legs, and gills are located underneath of expanded dorsal (top) body sections.

Be aware of counterfeit stream currency (false water penny beetle larvae). False water pennies belong to the family Eubriidae and have a different pollution tolerance value of 5. False water pennies have serrated edges around the edge of the organism (like teeth). If your water penny is false, write the name Eubriidae on the data sheet. Use a tolerance value of 5 to figure the HBI value.

67 Family: Ptilodactylidae — Common Name: Ptilodactid Beetle
Pollution tolerance: 2 (low) — Probability: Rare
Feeding group: Shredder — Type of stream: Moderate to fast flows
Location in stream: Burrowing in soft substrates — Location in key: #43
Trivia: These brown arc-shaped larvae are generally about 10-20 mm. They are easy to see in the field. The larvae are not commonly collected. These look like giant riffle beetle larvae.

Diptera **Order**
Common Name: True Flies

68
Family: Athericidae
Common Name: Water Snipe Fly
Pollution tolerance: 2 (low)
Probability: Rare
Feeding group: Predator
Type of stream: Moderate to fast flows
Location in stream: Burrowed in the substrate
Location in key: #49
Trivia: Water snipe flies have a rough appearance to the exoskeleton. The body is elongate with several tail-like structures. The body narrows to a point at the opposite end of the tail-like structures. There are prolegs along the underside of the abdomen. They are piercer-predators who prey on midge and mayfly larvae.

69
Family: Blephariciidae
Common Name: Net-Winged Midge Fly
Pollution tolerance: 0 (low)
Probability: Rare
Feeding group: Scraper
Type of stream: Very fast flows, very high gradient
Location in stream: On emergent rocks in a splash zone
Trivia: The Net-Winged Midge is only found in high-velocity cascades or waterfalls as it requires an abundance of oxygen. They are very rarely found at SEARCH sites. They have six suckers along its body to attach itself to rocks in swiftly moving water.

70
Family: Ceratopogonidae
Common Name: Biting Midge Fly
Pollution tolerance: 6 (moderate)
Probability: Likely
Feeding group: Predator
Type of stream: Slow flows
Location in stream: On soft substrate at edge of stream
Location in key: #51
Trivia: Biting midge larvae are generally about 2-5 mm long and milky white. They are similar to Chironimidae, except that they usually do not have any prolegs. They live on the periphery of water bodies as they require both aquatic and terrestrial habitats. As adults, biting midges can be quite a nuisance to humans as they can fit through mosquito netting and can deliver a painful bite.

71
Family: Chironimidae
Common Name: Midge Fly
Pollution tolerance: White-6 (moderate); Red-8 (high)
Probability: Probable
Feeding group: Collector-gatherer
Type of stream: All types
Location in stream: On substrate
Location in key: #71
Trivia: Midge larvae are very thin, about ½ inch long, and are white when preserved. There are about 100 different genera of midges in CT. These can be divided into two main groups: the white and red midges. The color in the red midges comes from a hemoglobin-like compound which allows the midge to survive in very low oxygen levels. In some streams, midges can be very abundant. When Chironimidae is the dominant family, comprising more than 70% of the sample, the water quality may be impacted.

72
Family: Empididae
Common Name: Aquatic Dance Fly
Pollution tolerance: 6 (moderate)
Probability: Rare
Feeding group: Predator
Type of stream: Any flows
Location in stream: Burrowed in substrate
Location in key: #49
Trivia: Aquatic dance flies have a white body and the exoskeleton does not have a rough appearance. There are prolegs along the underside of the abdomen and there are several very small tail-like structures. The larvae and adults feed on mosquito and black fly larvae, making the aquatic dance fly a beneficial insect to humans.

73 Family: Simuliidae
Common Name: Black Fly
Pollution tolerance: 6 (moderate)
Probability: Probable
Feeding group: Collector-Filterer
Type of stream: Moderate to fast flows; Very common just downstream from a lake or pond
Location in stream: Attached to rocks in riffle areas
Location in key: #47
Trivia: Black flies are whitish-grey and are shaped like a bowling pin, having one end much wider than the other. The larvae can be up to ½ inch long. Black flies have a ring of small hooks at the back end of the abdomen that enables them to adhere to a rock and not be swept away by the current. They use a brush-like structure to filter fine organic matter from the water column. Black fly abundance is strongly related to the time of year. In CT, the greatest numbers appear from mid to late April.

74 Family: Tabanidae
Common Name: Horse Fly
Pollution tolerance: 6 (moderate)
Probability: Rare
Feeding group: Predator
Type of stream: Any flows
Location in stream: Burrowed in substrate
Location in key: #51
Trivia: Horse fly larvae are white and do not have any prolegs or tail-like structures. Instead they have creeping welts which are specialized areas around the body to help the organism move through the substrate. Larvae range from 15-60 mm. Both the larvae and adults of this family can deliver a painful bite.

75 Family: Tipulidae
Common Name: Crane Fly
Pollution tolerance: 3 (low)
Probability: Probable
Feeding group: Shredder
Type of stream: Moderate to fast flows
Location in stream: Burrowed in substrate and leaf packs
Location in key: #50
Trivia: All crane flies have what appear to be tails, however they are respiratory organs. Most crane fly larvae are very large at around 2 inches long. Some species have a bulb-like structure near the tails, while others have dark areas on the top and bottom of the abdomen. The adult crane fly looks like a giant mosquito, however these insects cannot bite.

Ephemeroptera Order

Common Name: Mayflies
Trivia: Most mayflies have three tails, although some appear to have two. All mayflies have only one tarsal claw (toe) at the end of each leg. They have gills on the dorsal (top) side of the abdomen. In general, mayflies actively gather fine organic material and have low to moderate pollution tolerances.

76 Family: Baetidae
Common Name: Small Minnow Mayfly
Pollution tolerance: 4 (moderate)
Probability: Likely
Feeding group: Collector-gatherer
Type of stream: Moderate to fast flows
Location in stream: On and in rocky substrates
Location in key: #7
Trivia: These can be very small nymphs at 2-4 mm. Some genera appear to have only two tails. These mayflies can be very abundant when conditions permit. However, due to their small size, they are easily missed when sampling.

77 Family: Baetiscidae
Common Name: Armored Mayfly
Pollution tolerance: 3 (low)
Probability: Rare
Feeding group: Scraper
Type of stream: Slow to moderate flows
Location in stream: Burrowed in substrate
Location in key: #3
Trivia: The family Baetiscidae contains only one genus, Baetisca. Armored mayfly larvae can be 4-14 mm, and they are very distinctive due to the large shield covering the dorsal (top) side of the body. The shield usually extends from just below the head to the sixth abdominal segment, completely covering the gills underneath.

78 Family: Caenidae
Common Name: Small Squaregill Mayfly
Pollution tolerance: 7 (high)
Probability: Rare
Feeding group: Collector-gatherer
Type of stream: Slow to moderate flows
Location in stream: On substrate in slower margins
Location in key: #3
Trivia: Small squaregill mayflies are distinct in that the gills on the second abdominal segment are rather enlarged and square.. The larger gills do not respire – their purpose is to protect the other gills from excess sediment. Caenidae includes some of the smallest mayflies, with a maximum length of 6 mm.

79 Family: Ephemerellidae
Common Name: Spiny Crawler Mayfly
Pollution tolerance: 1 (low)
Probability: Likely
Feeding group: Collector-gatherer
Type of stream: Moderate to fast flows
Location in stream: On rocks and coarse organic substrates
Location in key: #4
Trivia: The distinguishing characteristic for the family is that gills are absent from the first and second abdominal sections. The name is derived from the serrated edge of the abdominal sections. This is a large family with a half dozen genera found in CT and are one of the most commonly collected mayfly families.

Drunella is a genus under Ephemerellidae. It has a pollution tolerance of 0 and is one of the most wanted macroinvertebrates. The inside surface of the front legs of Drunella are jagged like a serrated knife. Additionally, this section is much thicker than the rest of the leg parts. The enlarged front leg section has been described by students to be "like the arms of a body builder."

80 Family: Ephemeridae
Common Name: Common Burrower Mayfly
Pollution tolerance: 4 (moderate)
Probability: Rare
Feeding group: Collector-gatherer
Type of stream: Slow to moderate flows
Location in stream: Burrowed in soft substrate
Location in key: #10
Trivia: As suggested by their name, common burrower mayflies dig down into mucky substrates to create U-shaped pockets in which to inhabit. They have developed tusks and widened front legs to assist in this task. While in the burrow, they flap their gills to maintain the flow of water, and therefore oxygen. This family is rarely found in CT as it requires the perfect combination of very malleable but strong sediment in which to dig.

81 Family: Heptageniidae
Common Name: Flat Headed Mayfly
Pollution tolerance: 4 (moderate)
Probability: Probable
Feeding group: Scraper
Type of stream: Any flows
Location in stream: On and underneath cobble and organic substrates
Location in key: #6
Trivia: Flat headed mayflies are very common in CT streams. Often they can be numerously found with the Hydropsychid Caddisfly. They are well adapted to live in fast currents. The bodies are extremely flattened. The head is broad and flat, which forces the water up and over the insect, holding it to the substrate.

Epeorus, a genus within the Heptageniidae family, is one of the most wanted macroinvertebrates in CT. At first glance, it may appear to be a stonefly because they only seem to have two tails. If you look closely, you may see a third stubby tail in between the two longer ones. If there is only one claw at the end of each leg, the organism will be a mayfly.

82 Family: Isonychiidae
Common Name: Brushlegged Mayfly
Pollution tolerance: 2 (low)
Probability: Probable
Feeding group: Collector-filterer
Type of stream: Moderate to fast flows, Low gradient
Location in stream: On surface of rocks
Location in key: #5
Trivia: There is only one genera, *Isonychia*, found in CT. The nymphs are the strongest swimmers of any aquatic insect. The three tails (caudal filaments) are made up of a series of small hairs. These hairs act like an oar on a boat; as the mayfly undulates, the tails propels it through the water. This family of mayfly passively filters fine particulate matter from the water column. Close inspection of the front legs will reveal a double row of long hairs. These hairs trap fine matter as it passes through. No other mayfly has this characteristic.

83 Family: Leptophlebiidae — Common Name: Prong Gill Mayfly
Pollution tolerance: 2 (low) — Probability: Occasional
Feeding group: Collector-gatherer — Type of stream: Moderate to fast flows, Forested Areas
Location in stream: In gravel amongst organic deposits — Location in key: #8
Trivia: These are small mayflies which have forked gills. The gills are often lost when the organism is preserved. Without the gills, the mayfly has a very smooth and shiny exoskeleton, like well-polished leather shoes.

84 Family: Potamanthidae — Common Name: Hackle Gill Mayfly
Pollution tolerance: 4 (moderate) — Probability: Occasional
Feeding group: Collector-gatherer — Type of stream: Moderate to fast flows; Especially tolerant of warm, shallow water
Location in stream: In and on coarse substrate — Location in key: #10
Trivia: *Anthopotamus* is the only genera of the Potamanthidae family that exists in North America, where it is widespread. They have tusks, however they do not burrow in to the substrate.

85 Family: Siphloneuridae — Common Name: Primitive Minnow Mayfly
Pollution tolerance: 7 (high) — Probability: Occasional
Feeding group: Collector-gatherer — Type of stream: Moderate to fast flows
Location in stream: In vegetation margins and coarse substrates — Location in key: #7
Trivia: This family is easy to confuse with both the brushlegged mayflies and the small minnow mayflies, however, the primitive minnow mayflies do not have a double row of long hairs on the front legs and they have long antennae. The members of this family are very good swimmers as the rows of hairs on the tails function as a paddle.

Megaloptera Order

86 Family: Corydalidae — Common Name: Dobsonfly or Hellgrammite
Pollution tolerance: 5 (moderate) — Probability: Probable
Feeding group: Predator — Type of stream: Moderate to fast flows
Location in stream: Under loosely embedded stones — Location in key: #21
Trivia: The dobsonfly larvae come in a variety of sizes, from 1.5 -4.5 inches long. Like the alderfly, each abdominal segment has a pair of soft spine-like appendages, however there are two prolegs at the end of the abdomen, each with two hooks. Larvae are very common in all types of CT streams. These larvae can deliver a painful bite. When these larvae are used as fishing bait, they are called hellgrammites.

87 Family: Sialidae — Common Name: Alderfly
Pollution tolerance: 4 (moderate) — Probability: Rare
Feeding group: Predator — Type of stream: Moderate to fast flows
Location in stream: In pools or along the stream margin — Location in key: #21
Trivia: Alderfly larvae have a single long filament coming out of the end of the abdomen. There are soft spine-like appendages extending from each abdominal segment. They are have well developed mandibles for capturing prey. There is just one genera that occurs in North America. These organisms are rarely collected at Search sites in riffle areas.

Odonata Order

Common Name: Dragonflies and Damselflies

Dragonfly Trivia: All dragonfly nymphs have 3 spikes or triangular points at the end of the abdomen. They move around primarily by crawling, however short jets of water can be expelled through the rectum for rapid movement. Dragonfly adults cannot fold their wings up over their back, and therefore are easily differentiated from the closely related damselflies. The lower lip of all Odonata are hinged, allowing it to extend out to capture prey.

Damselfly Trivia: Damselflies are more slender, smaller, and delicate when compared to dragonflies. Adults can be differentiated from dragonflies because damselflies can fold their wings straight up over the body, while dragonflies cannot. Nymphs have what looks like three long tails, though these are actually gills. Larvae are found primarily in slow moving low gradient streams, ponds, and wetlands.

88

Family: Aeshnidae
Common Name: Darner Dragonfly
Pollution tolerance: 3 (low)
Probability: Probable
Feeding group: Predator
Type of stream: Any flows
Location in stream: Amongst rocks and emergent vegetation
Location in key: #28

Trivia: The darners are the largest adult dragonflies in CT. The nymphs are usually very dark and almost black. Their bodies are elongate with small thin legs. They are common in a variety of streams. Unlike other dragonfly nymphs, the darners stalk their prey.

89

Family: Calopterygidae
Common Name: Broad Winged Damselfly
Pollution tolerance: 5 (moderate)
Probability: Occasional
Feeding group: Predator
Type of stream: Slow flows, Low gradient
Location in stream: Stream margins with abundant vegetation
Location in key: #30

Trivia: The first segment of the antennae, which is almost half of the entire antennae, separates this family from all other damselflies. The adult broadwing damselfly is very common along streams and is rather striking with an iridescent green body with black wings.

90

Family: Coengrionidae
Common Name: Narrow Winged Damselfly
Pollution tolerance: 9 (high)
Probability: Likely
Feeding group: Predator
Type of stream: Slow to moderate flows, Low gradient
Location in stream: On rocks and vegetation
Location in key: #31

Trivia: These damselflies are the most common. The gills of most members of this family are two-toned when alive. The adults have clear wings and bright blue or green bodies.

91

Family: Cordulergastridae
Common Name: Biddie Dragonfly
Pollution tolerance: 3 (low)
Probability: Occasional
Feeding group: Predator
Type of stream: Moderate to fast flows, Low to moderate gradient, Woodlands
Location in stream: Burrowed in soft substrate
Location in key: #29

Trivia: These dragonfly nymphs appear to be extremely robust and hairy. They have a deeply rounded lower lip (labium) which extends out almost half the length of the body. The nymphs are light brown to blend in with the fine silt and sand on the stream bottom. They may remain buried in substrate with only their eyes protruding to wait for prey for weeks at a time.

92 Family: Gomphidae
Common Name: Club Tail Dragonfly
Pollution tolerance: 1 (low)
Probability: Probable
Feeding group: Predator
Type of stream: All flows
Location in stream: In or on organic substrate
Location in key: #27
Trivia: All clubtail dragonflies have short antennae, of which the last section is bulbous like the end of a cotton swab. There are many different species living in a wide variety of microhabitats. Most are adapted for burrowing into the substrate to wait for prey.

93 Family: Lestidae
Common Name: Spread Winged Damselfly
Pollution tolerance: 9 (high)
Probability: Rare
Feeding group: Predator
Type of stream: Very slow flows, Low gradient, Swampy or wetland areas
Location in stream: Amongst thick emergent vegetation
Location in key: #31
Trivia: The lower lip (labium) on these nymphs are very long and slender. The gills found at the end of the abdomen are very dark and thick. Adults hold the wings slightly open when at rest. These are not typically found at Search sites in riffle areas, but are very common in vernal pools.

94 Family: Libellulidae
Common Name: Common Skimmer Dragonfly
Pollution tolerance: 9 (high)
Probability: Rare
Feeding group: Predator
Type of stream: Slow flows, Low gradient, Swampy or wetland areas
Location in stream: Along edges of streams in vegetation
Location in key: #29
Trivia: Common skimmer dragonflies are commonly found in ponds and in wetlands. They are not typically found in riffle areas at Search sites.

Plecoptera Order

Common Name: Stoneflies
Trivia: All stoneflies are very intolerant of organic pollutants. They have two tails and two tarsal claws (toes) at the end of each leg. They are all dorsally flattened. Stoneflies prefer to live in very fast moving water under rocks and in organic debris. All stoneflies indicate high water quality.

95 Family: Capniidae
Common Name: Slender Winter Stonefly
Pollution tolerance: 1 (low)
Probability: Rare
Feeding group: Shredder
Type of stream: Moderate to fast flows, Lower order streams
Location in stream: In and on substrate
Location in key: #16
Trivia: Slender winter stoneflies prefer colder months and are therefore found most often during the winter, hence their name. They will often live in temporary streams and burrow into the moistened substrate while the stream is dry. The wing pads are parallel to the body axis and the first pair of wing pads overlap the second pair. These are similar to the rolled wing stonefly larvae and they can be differentiated by the jaggedness of the abdomen compared to the smooth abdominal sides of Leuctridae.

96 Family: Chloroperlidae
Common Name: Green Stonefly
Pollution tolerance: 1 (low)
Probability: Likely
Feeding group: Predator
Type of stream: Moderate to fast flows, High gradient, Forested areas
Location in stream: In and on substrate in riffle areas
Location in key: #15
Trivia: The green stoneflies are small, thin, and elongated. The wing pads are parallel to the body axis. The tails are shorter than the length of the abdomen. These nymphs prefer upland streams. Adult Chloroperlidae are bright yellowish-green, hence the name.

97 Family: Leuctridae
Common Name: Rolled Wing Stonefly
Pollution tolerance: 0 (very low)
Probability: Likely
Feeding group: Shredder
Type of stream: Fast flows
Location in stream: Burrowed in substrate
Location in key: #16
Trivia: These are small, elongated nymphs and often they have a reddish-brown tint. The wing pads are parallel to the body axis and the first pair of wing pads overlap the second pair. The abdomen is smooth along the sides.

98 Family: Nemouridae
Common Name: Nemourid Broadback Stonely
Pollution tolerance: 2 (low)
Probability: Occasional
Feeding group: Shredder
Type of stream: Moderate to fast flows, Forested areas
Location in stream: In and on leaf packs
Location in key: #17
Trivia: These are small stoneflies at about ½ inch long. The gills are located on the underside of the throat, giving the organism the appearance of having a hairy neck. They may be confused with Taeniopterygidae, however the latter have a single small filamentous gill at the base of each leg. Nemourids can be very abundant when conditions permit.

99 Family: Peltoperlidae
Common Name: Roachlike Stonefly
Pollution tolerance: 0 (very low)
Probability: Occasional
Feeding group: Shreddre
Type of stream: Fast flows, High gradient, Forested areas, Cold water
Location in stream: In and on coarse organic substrate
Location in key: #13
Trivia: The roachlike stonefly is very intolerant of environmental stresses. The insect is shaped like an inverted tear drop. The body is uniformly brown and is very shiny. These organisms are different from all other stoneflies in that the head is broadly joined to the thorax.

100 Family: Perlidae
Common Name: Common Stonefly
Pollution tolerance: 1 (low)
Probability: Probable
Feeding group: Predator
Type of stream: Moderate to fast flows, High gradient
Location in stream: Burrowed in substrate
Location in key: #12
Trivia: This stonefly is very common in the streams of CT. The nymph can grow to 1.5 inches long and comes in a variety of brown color patterns. Perlid stoneflies have a tuft of gills where the leg meets the body, which may look like hairy armpits. When these organisms are in an oxygen-stressed environment, they will try to physically move water over their gills by doing push-ups.

101 Family: Perlodidae
Common Name: Perlodid Stonefly
Pollution tolerance: 2 (low)
Probabilty: Occasional
Feeding group: Predator
Type of stream: Moderate to fast flows, High gradient
Location in stream: Burrowed in substrate
Location in key: #18
Trivia: The nymphs are long and slender, only about 3-6 mm wide. The body may have a light pattern on the wing pads and head, while the abdomen may have several light lines. The hind wings are divergent from the body axis. These can be differentiated from the common stoneflies by their lack of branched gills underneath each leg.

102 Family: Pteronarcyidae
Common Name: Giant Stonefly
Pollution tolerance: 0 (very low)
Probability: Occasional
Feeding group: Shredder
Type of stream: Fast flows, High gradient
Location in stream: In leaf packs in riffle areas
Location in key: #12
Trivia: The giant stonefly appear to be made out of a rigid exoskeleton. This family is the only stonefly which has gills present on the first few sections of the abdomen. To locate these gills, look at the ventral (bottom) side of the organism. The body is usually black and sometimes has white tips on the ends of the antennae. This stonefly can grow up to 2 inches in length. They have no tolerance for pollution. These stoneflies are not commonly found in CT streams.

103 Family: Taeniopterygidae
Common Name: Winter Stonefly
Pollution tolerance: 2 (low)
Probability: Rare
Feeding group: Shredder
Type of stream: Moderate to fast flows
Location in stream: Edges of stream in organic substrate
Location in key: #18
Trivia: The winter stonefly has a stout body and rather divergent wing pads. It generally emerges during the colder months and is therefore found primarily during the winter.

Trichoptera Order

Common Name: Caddisflies
Trivia: Caddisflies, as a group, are elongate organisms with soft abdomens. There are two major types, the free-living forms and the case-building forms. Most of the free-living forms build silken webs on the substrate to filter fine organic material. One free-living family is predatory. The case builders make a shelter out of inorganic or organic materials. The case is used to disguise the organisms as they graze for food. Caddisflies are very common in CT streams.

104 Family: Brachycentridae
Common Name: Humpless Case Maker Caddisfly
Pollution tolerance: 1 (low)
Probability: Likely
Feeding group: Shredder
Type of stream: Any flows
Location in stream: On substrate in slower waters
Location in key: #38 (larva); #58 (case)
Trivia: These are medium-sized caddisflies (5-15mm). They build cases out of a variety of organic and inorganic materials. The cases are constructed of thin strips of material assembled in a circular or square form.

105 Family: Glossosomatidae
Common Name: Saddle Case Maker Caddisfly
Pollution tolerance: 0 (very low)
Probability: Probable
Feeding group: Scraper
Type of stream: Moderate to fast flows
Location in stream: Fastened to cobbles in riffle areas
Location in key: #42 (larva); #60 (case)
Trivia: These caddisflies build a case of a few small pebbles. The shape of the case looks like that of a tortoise. They are very common in streams when conditions permit. The organism has an elongated head compared to other caddisflies.

106 Family: Helicopsychidae
Common Name: Snail Case Maker Caddisfly
Pollution tolerance: 3 (low)
Probability: Rare
Feeding group: Scraper
Type of stream: Fast flows
Location in stream: On gravel or sand deposits
Location in key: #38 (larva); #61 (case)
Trivia: These caddisflies are very small. They make a snail-shaped case constructed of tiny grains of sand and rock. The entire case is about the size of a pea. They can be very common in clear cold gravelly streams. They are very difficult to see in the field.

107 Family: Hydropsychidae
Common Name: Common Netspinner Caddisfly
Pollution tolerance: 4 (moderate)
Probability: Probable
Feeding group: Collector-filterer
Type of stream: Any flows, Low to moderate gradient
Location in stream: In substrate in riffle areas
Location in key: #34
Trivia: The common netspinner caddisflies are the most commonly collected of all caddisfly families. They are distinguished from all other caddisflies in that the ventral (bottom) sections of the abdomen have pairs of fluffy gills. The organisms spin a silk web between the rocks where it filters fine organic matter from the water column. These caddisflies will defend a small territory around each web. They are extremely common below pond outflows and sewage treatment plants. When these are the dominant family in a sample comprising greater than 70% of the organisms collected, water quality is probably impaired.

108 Family: Hydroptilidae
Common Name: Micro Caddisfly or Purse Case Caddisfly
Pollution tolerance: 4 (moderate)
Probability: Occasional
Feeding group: Scraper
Type of stream: Any flows
Location in stream: Attached to submerged vegetation
Location in key: #34 (larva); #62 (case)
Trivia: These are extremely small caddisflies, only a few millimeters in length. They make small cases out of a variety of materials. Above each pair of leg, on each thoracic segment, is a hardened (sclerotized) plate. These are extremely difficult to see in the field.

109 Family: Lepidostomatidae
Common Name: Lepidostomatid Case Maker Caddisfly
Pollution tolerance: 1 (low)
Probability: Rare
Feeding group: Shredder
Type of stream: Any flows, Forested areas
Location in stream: In detritus at stream margins
Location in key: #35 (larva); #57 (case)
Trivia: This caddisfly builds a case out of rectangular pieces of bark or wood. It resembles the family Brachycentridae, however it has lateral humps on the first section of its abdomen.

110 Family: Leptoceridae
Common Name: Long Horned Case Maker Caddisfly
Pollution tolerance: 4 (moderate)
Probability: Occasional
Feeding group: Shredder
Type of stream: Slow flows, Low to moderate gradient
Location in stream: In detritus at stream margins
Location in key: #37 (larva); #58 (case)
Trivia: These caddisflies are distinguished from all others in that the antennae are very long for caddisflies – they have 1-4 sections which are 1-4 mm in total length. They are very common when conditions permit. Most genera are shredders.

111 Family: Limnephilidae
Common Name: Northern Case Maker Caddisfly
Pollution tolerance: 4 (moderate)
Probability: Likely
Feeding group: Shredder
Type of stream: Any flows
Location in stream: Anywhere on the substrate
Location in key: #36 (larva); #56,#60,#63 (cases)
Trivia: This is the largest group of caddisflies with 40 genera found in North America. These are large elongate caddisflies, up to 20 mm. They are case builders, using a variety of materials, usually whatever is most abundant in their environment. The largest northern case maker caddisfly in CT builds a case of large stick fragments.

112 Family: Molannidae
Common Name: Hoodcase Maker Caddisfly
Pollution tolerance: 6 (moderate)
Probability: Rare
Feeding group: Scraper
Type of stream: Slow to moderate flows
Location in stream: In and on sandy substrate
Location in key: #62
Trivia: The cases on molannid caddisflies are constructed of sand grains and are shaped as a flattened tube with a hood that extends over the opening of the case. The larvae are generally very difficult to see in the field as the case often blends into the substrate. These caddisflies are rarely collected without their case.

113 Family: Odontoceridae
Common Name: Strong Case Maker Caddisfly
Pollution tolerance: 0 (very low)
Probability: Occasional
Feeding group: Scraper
Type of stream: Any flows
Location in stream: In and on coarse substrate
Location in key: #37 (larva); #62 (case)
Trivia: These caddisflies build arc-shaped cases of small stone fragments. The larvae are often grouped together on the sides of cobble.

114 Family: Philopotamidae
Common Name: Finger Net Caddisfly
Pollution tolerance: 3 (low)
Probability: Probable
Feeding group: Collector-filterer
Type of stream: Moderate to fast flows
Location in stream: On substrate in riffle areas
Location in key: #39
Trivia: The finger-net caddisflies are elongate and slender. They are one of four families of filtering caddisflies. They build long tube-shaped nets with fine mesh to filter particles out of the water. The abdomen is white and the head is bright orange. The upper lip of the organism is transparent and t-shaped.

115 Family: Phryganiidae
Common Name: Giant Case Maker Caddisfly
Pollution tolerance: 4 (moderate)
Probability: Occasional
Feeding group: Shredder
Type of stream: Slow to moderate flows, Low to moderate gradient
Location in stream: In coarse organic material
Location in key: #41
Trivia: These caddisflies can be relatively large when full-grown, up to 50 mm. These caddisflies build elongate cases constructed of plant fragments. Unlike other caddisflies, giant case makers can easily abandon their cases when disturbed, so they are rarely collected with their case.

116 Family: Polycentropodidae
Common Name: Trumpet Net Caddisfly
Pollution tolerance: 6 (moderate)
Probability: Occasional
Feeding group: Collector-filterer, Predator
Type of stream: Slow to moderate flows, Low gradient
Location in stream: In stream margins on coarse organic material
Location in key: #42
Trivia: This is the least commonly collected net spinner caddisfly. The abdomen may have a purplish tint when preserved. The head may have a dark spotted pattern. Trumpet net caddisflies use their net to sense prey. When prey touches a silk thread of the net, the caddisfly can sense it and attack its victim.

117 Family: Rhyacophilidae
Common Name: Free Living Caddisfly or Michelin Man Caddisfly
Pollution tolerance: 0 (very low)
Probability: Likely
Feeding group: Predator
Type of stream: Moderate to fast flows, Moderate to high gradient
Location in stream: On mossy substrate
Location in key: #41
Trivia: This is a very intolerant family of caddisflies. It is the only caddisfly group that does not build a case or retreat as a larva. It roams freely for prey among mosses and algae. The larvae are large, bright green, and very mobile when alive. When preserved, they take on a purple tint. The prolegs at the end of the abdomen are long and have large hooks.

CRUSTACEA Class

118 Order: Amphipoda — Common Name: Scud or Sideswimmer
Pollution tolerance: 6 (moderate) — Probability: Probable
Feeding group: Collector-gatherer — Type of stream: Slow to moderate flows, Low gradient
Location in stream: In and on organic substrate — Location in key: #23
Trivia: Scuds appear to be bleached white when preserved. They can swim very rapidly on their sides when disturbed, hence the name "sideswimmer". Most scuds are omnivorous and feed in organic debris that accumulates in stream margins. They are important organisms in the breakdown of coarse particulate materials and are also a very important source of food for fish. They can be very abundant when conditions permit.

119 Order: Decapoda — Common Name: Freshwater Crayfish
Pollution tolerance: 6 (moderate) — Probability: Likely
Feeding group: Collector-gatherer — Type of stream: Slow to moderate flows
Location in stream: Burrowed in substrate or under rocks — Location in key: #22
Trivia: Crayfish resemble tiny lobsters. They are scavengers on the stream bottom, feeding on a variety of food sources. Crayfish are the largest stream invertebrates and often they can be extremely numerous. They are a food source for both fish and humans.

120 Order: Isopoda — Common Name: Freshwater Sow Bug
Pollution tolerance: 8 (high) — Probability: Occasional
Feeding group: Collector-gatherer — Type of stream: Slow flows, Low gradient
Location in stream: In and on substrate — Location in key: #23
Trivia: Aquatic sow bugs are small dorsally flattened crustaceans. They are grey when preserved. These are an important source of food for fish.

MOLLUSCA Phylum

121 Class: Bivalvia — Common Name: Freshwater Clam or Mussel
Pollution tolerance: 7 (high) — Probability: Likely
Feeding group: Collector-filterer — Type of stream: Slow flows, Below ponds or in wetland areas
Location in stream: Buried in fine substrate — Location in key: #54
Trivia: Two bivalve families are common in CT. Unionidae are very large mussels at up to 3 inches long, while Sphaeriidae are the size of a finernail (and are therefore called fingernail clams). The most famous member of the freshwater bivalves is the zebra mussel. Zebra mussels are an introduced invasive species that have had a major impact on North American aquatic ecosystems.

122 Class: Gastropoda — Common Name: Snail
Pollution tolerance: 7 (high) — Probability: Likely
Feeding group: Scraper — Type of stream: Any flows, Below ponds or in wetland areas
Location in stream: On surfaces of rocks and finer sediments — Location in key: #54
Trivia: There are two major groups of snails in CT – they can be differentiated by facing the snail toward you and determining the direction to which the snail opens at the bottom. Gilled snails open to the right. They obtain dissolved oxygen from the water and are indicative of high water quality. Lunged snails open to the left. They take in oxygen from the air, so they can tolerate very low dissolved oxygen levels.

AQUATIC WORMS

123 Sub-Class: Hirudinea – Phylum: Annelida — Common Name: Leech
Pollution tolerance: 10 (very high) — Probability: Rare
Feeding group: Predator — Type of stream: Any flows, but primarily slower flows
Location in stream: In and on substrate — Location in key: #45
Trivia: Leeaches have a suction disc at both ends of the body. Leeches feed on the blood of a host organism by using a drill-like rasping tongue to penetrate the skin. The leech injects a chemical called hirudin which prevents the blood from clotting. Some leeches are used in medical practice to remove the build-up of blood and body fluids in bruised or surgically reattached appendages and tissues. When preserved, leeches tend to curl up.

124 Class: Oligochaeta – Phylum: Annelida — Common Name: Aquatic Earthworm
Pollution tolerance: 8 (high) — Probability: Likely
Feeding group: Collector-gatherer — Type of stream: Any flows, but primarily slower flows
Location in stream: In and on fine substrate — Location in key: #45
Trivia: Aquatic earthworms have segmented bodies. These organisms, especially tubifex worms, can live in extremely polluted water with very low dissolved oxygen levels. Often, severely impacted streams will have large populations of these worms.

125 Phylum: Nematoda — Common Name: Nematode or Roundworm
Pollution tolerance: 5 (moderate) — Probability: Occasional
Feeding group: Predator — Type of stream: Any flows
Location in stream: In and on substrate — Location in key: #52
Trivia: Roundworms are very common in CT streams though they are rarely collected due to their very small size. Some species are free-living, but others are parasitic and may be found inside other aquatic macroinvertebrates.

126 Class: Turbellaria – Phylum: Platyhelminthes — Common Name: Planarian or Flatworm
Pollution tolerance: 4 (moderate) — Probability: Rare
Feeding group: Predator — Type of stream: Slow to moderate flows
Location in stream: On rocky substrate — Location in key: #52
Trivia: These organisms look like a cross-eyed unsegmented leech. They occur in a wide variety of habitats though they are rarely collected. When a large number of planarians are present in a collection, the site is most likely affected by organic pollution. When preserved, flatworms tend to curl up.

ARACHNIDS

127 Class: Arachnida — Common Name: Spider
Pollution tolerance: 4 (moderate) — Probability: Occasional
Feeding group: Predator — Type of stream: Slow flows
Location in stream: In water column, on substrate — Location in key: #19
Trivia: Water mites are the most commonly found aquatic arachnid. They are very small and resemble a tick. Some of the adult forms can be bright red or orange.