

ORDER: PLECOPTERA (stoneflies)

with special reference to those found in Utah
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revised by: S. W. Judson, September 2008

Diagnosing Features, adults:

- hind wing usually has large anal lobe
- soft-bodied and flattened
- wings reticulated and fold flat over abdomen** (Fig. 1)
- fore wings elongated and narrow
- long antennae
- tarsi usually 3-segmented
- chewing mouth parts

Diagnosing Features, nymphs:

- flattened, generalized insect
- two tarsal claws** (Fig. 2)
- two cerci** (Fig. 3)
- wing pads usually present, especially in older nymphs
- long antennae

Habitat: near streams or rocky lake shores, nymphs are aquatic

Trophic Habits: some detritivores (shredders and more), others predators (but collectors as young)

Development: hemimetabolous

Preservation: alcohol, for both nymphs and adults.

Notes: Stoneflies are indicators of the quality of aquatic habitats. The northern hemisphere families are often divided into two “groups”: the Euholognatha with glossa and paraglossa of equal length, and the Systellognatha with the paraglossa much larger than the glossa. In this classification care must be taken because the Peltoperlidae and Pteronarcyidae have the paraglossa and glossa of equal length, but are often placed in the Systellognatha for other reasons. The following treatments are arranged by Suborders and overall similarity of families within the suborders placed adjacently. Appendix A is a species list by UT counties.

Figures:

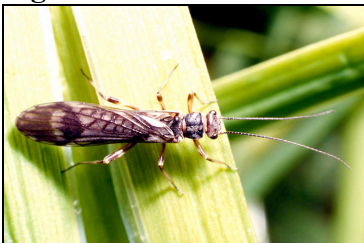


Figure 1. Wings folded flat
Phot by CRNelson.



Figure 2. Two tarsal claws.
Photo by SWJudson.



Figure 3. Two cerci.
Photo from Invertebrate ID CD.

SUBORDER: EUHOLOGNATHA
Paraglossae and glossae of equal length. (Fig. 4)



Figure 4. Paraglossae and glossae equal.
Photo from Invertebrate ID CD.

FAMILY: CAPNIIDAE

Morphology (nymphs):

Small, elongate stoneflies without gills. (Fig. 5)

Glossa and paraglossa of same length and appearance.

Similar in appearance to leuctrids but:

1. **with a pleural fold extending on abdomen from segment 1 to 9.** (Fig. 6)
2. Nymphs generally in the stream as earlier in the season than leuctrids
3. Adults have long cerci. (Fig. 7)

Ecology: Nymphs are hyporheic and only found in the streams and lakes immediately before emergence. Many genera and species are restricted to high mountain, well-oxygenated streams. Nymphs are sprawlers or clingers. Trophically, nymphs are shredder-detritivores. Adults emerge in the winter and can be found walking on snow. Often abundant. Many genera in mountainous areas.

Utah Genera:

Capnia

Common, throughout Utah.

Emerge from November to May.

Utah species:

C. confusa Claassen

C. cygna Jewett

C. gracilaria Claassen

C. nana Claassen

C. uintahi Gaufin

C. utahensis Gaufin and Jewett

C. vernalis Newport

C. wanica Frison

Eucapnopsis brevicauda (Claassen)

Common: small mountain streams, higher elevation, widespread in Utah.

February to July emergence.

Isocapnia

Uncommon, northern half of Utah.

Emerge from March to June.

Utah species:

I. crinita (Needham and Claassen)

I. grandis (Banks)

I. hyalita (Ricker)

Mesocapnia frisoni (Baumann and Gaufin)

Common, large rivers in southern Utah.

Emerge January to May.

Utacapnia

Common, large rivers such as Logan and Provo Rivers.

Emerge from February to June.

Utah species:

U. logana (Nebeker and Gaufin)

U. lemoniana (Nebeker and Gaufin)

U. poda (Nebeker and Gaufin).

I. missouri Ricker

I. vedderensis (Ricker)

Figures:



Figure 6. Pleural fold extends along entire abdomen. Lateral view. Drawing by SWJudson.



Figure 5. Nymph general body form.
Photo from Invertebrate ID CD.



Figure 7. Typical terrestrial adult body form.
Note long cerci and winter habitus. Photo by CRNelson.

FAMILY: LEUCTRIDAE

Morphology (nymphs):

Small, elongate stoneflies without gills. (Fig. 8)

Glossa and paraglossa of same length and appearance.

Similar to capniids but:

1. **without as long of a pleural fold** (Fig. 9)
2. nymphs usually present in streams later
3. adult wings “rolled” around body (Fig. 10)
4. adults have short tails (Fig. 10)

Ecology: Nymphs are hyporheic and only found in the streams and lakes immediately before emergence. Many genera and species are restricted to high mountain, well-oxygenated streams. Some, however, are found in intermittent streams. Trophic habits are primarily detritus shredding. Most nymphs are sprawlers or clingers. Adults emerge in the late fall or winter.

Utah Genera:

Paraleuctra

Common in northern Utah in small mountain streams at higher elevations. Adults emerge January to August.

Utah species:

P. jewetti Nebeker and Gaufin

P. rickeri Gaufin and Ricker

P. occidentalis (Banks)

P. vershina Gaufin and Ricker

Perlomyia utahensis Needham and Claassen

Uncommon. Small mountain streams at higher elevations.

Northern and central Utah.

Adults emerge in spring and summer.

Figures:



Figure 9. Pleural fold on segments 1-7, often less conspicuous on segments 5-7. Lateral view. Drawing by SWJudson.



Figure 8. Nymph general body form. Photo from Invertebrate ID CD.



Figure 10. Typical terrestrial adult body form. Note rolled wings and short tails.

FAMILY: NEMOURIDAE

Morphology (nymphs):

Small, stocky stoneflies some with cervical (Fig. 11) or submental gills, others without gills. Often hairy and covered with debris. (Fig. 12)

Segment two of tarsus much shorter than either one or three.

Wing pads divergent.

Glossa and paraglossa of same length and appearance.

Adults have "X" venation in wing (Fig. 13)

Ecology: Nymphs often collected on woody debris. Many genera and species are restricted to high mountain, well-oxygenated streams. Most Nemourids are sprawlers or clingers. In terms of trophic relationships, they are generally shredder-detritivores and some are also facultative collector-gathers. This family is rated with a tolerance value of 2 for the Northwest. Adults (Fig. 14) generally emerge in spring.

Utah Genera:

Amphinemura

Common, widespread, throughout Utah.
Late summer emergence in small mountain streams.
Utah species:

- A. banksi* Baumann and Gaufin
- A. mogollonica* Baumann and Gaufin

Malenka

Very common in falls, small mountain streams and springs.
Widespread, throughout Utah.
Utah species:

- M. californica*. (Claassen)
- M. coloradensis* (Banks)

Podmosta

Uncommon.
Summer emergence in small mountain streams.
Utah species:

- P. decepta* (Frison)
- P. delicatula* (Claassen)

Prostoia besametsa (Ricker)

Common throughout northern Utah.
Spring emergence in small to medium sized mountain streams.

Zapada

Very common throughout Utah in small to medium mountain streams.
Utah species:

- Z. cinctipes* (Banks)
- Z. haysi* (Ricker)
- Z. columbiana* (Claassen)
- Z. frigida* (Claassen)

Figures:



Figure 11. Cervical gills. Photo from Invertebrate ID CD.



Figure 12. Nymph general body form. Photo from Invertebrate ID CD.

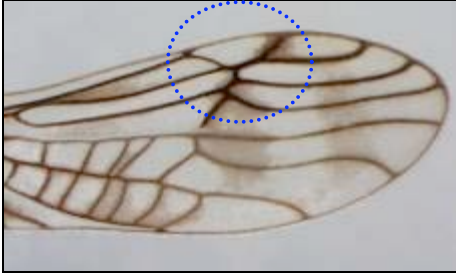


Figure 13. Diagnostic feature of Nemouridae: "X" wing venation. Photo by SWJudson.



Figure 14. Adult general body form. Note remnants of cervical gills. Photo by CRNelson.

FAMILY: TAENIOPTERYGIDAE

Morphology (nymphs):

small, stocky stoneflies without gills (except coxal gills in *Taeniopteryx*), generally larger than the similar nemourids (Fig. 15)

All tarsal segments of approximately equal length. (Fig. 16)

Wing pads divergent.

Glossa and paraglossa of same length and appearance.

Ecology: Nymphs are often collected on woody debris, leaf packs, or coarse sediments. Many genera and species are restricted to high, well-oxygenated streams. Nymphs generally have sprawling and clinging habits. Trophically, Taeniopterygids are shredders (detritivore or facultative collectors), gatherers, and scrapers. The family has a tolerance value of 2 as rated for the Northwest. Adults generally emerge in spring.

Utah Genera:

Doddsia occidentalis (Banks)

Rare. Northern Utah

Adults emerge February to May.

Oemopteryx foscetti (Ricketti)

Common in large rivers in Uintah Basin, South East and Cache.

Adults emerge January to March.

Taenionema

Common: widespread, throughout Utah.

Adults emerge from March to August.

Utah species:

T. nigripennis (Banks)

T. pacifica (Banks)

T. pallida (Banks).

Figures:



Figure 15. Nymph general form. Note how the nymph curls in a C shape.
Photo by SWJudson.

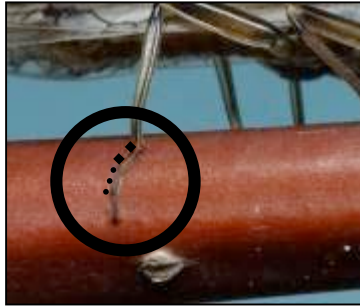


Figure 16. Tarsal segments equal in length. Diagnostic of both nymphs and adults.
Photo by CRNelson.

SUBORDER: SYSTELLOGNATHA

Paraglossae (outer) much longer than glossae. (Fig. 17)

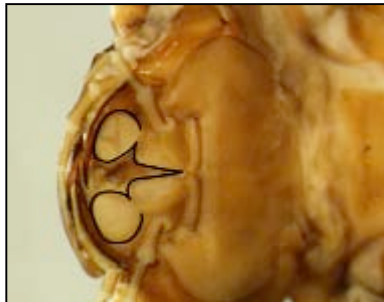


Figure 17. Unequal paraglossae and glossae.
Photo from Invertebrate ID CD.

FAMILY: CHLOROPERLIDAE

Morphology (nymphs):

Generally small, elongate stoneflies without gills.

Glossa much shorter than paraglossa and more pointed.

Cerci relatively short and stocky, but still with many articles.

Often yellow or bright green when alive. (Fig. 18, 19)

Ecology: Nymphs inhabit clean, clear upland streams. The subfamily Paraperlinae is hyporheic and only found in the streams and lakes immediately before emergence. Many genera and species are restricted to high, well-oxygenated streams. Nymphs are clingers. Nymphs are predominantly carnivorous predators although are sometimes facultative scrapers and collector-gathers. This family is rated with a tolerance value of 1 in the Northwest. Adults emerge in the summer and most are yellowish with some bright green.

Utah Genera:

Alloperla severa (Banks)

Common. Small streams, high elevations.

Paraperla frontalis (Banks)

Uncommon, northern Utah.

April to August emergence.

Utaperla sopladora (Ricker)

Rare Scattered in Utah.

May to July emergence.

Suwallia pallidula (Banks)

Common. Small streams and medium sized rivers.

S. lineosa (Banks) is in northern Utah

Sweltsa.

Common, throughout Utah.

April to October emergence.

Utah species:

S. borealis (Banks)

S. gaufini Baumann

S. coloradensis (Banks)

S. lamba (Needham and Claassen).

S. fidelis (Banks)

Triznaka:

Common, widespread in Utah.

May to August emergence.

Utah species: *T. diversa* (Frison), *T. pintada* (Ricker), *T. signata* (Banks).

Figures:



Figure 18. Nymph general body form.



Figure 19. Adult general body form.

FAMILY: PELTOPERLIDAE

Morphology (nymphs):

Glossa somewhat shorter than paraglossa and more pointed, but not as different from each other as in the Perlidae.

Thoracic sternites overlap like shingles. (Fig. 20)

“Roach-like” body shape (Fig 20, 21)

Gills present on thorax above the legs.

Ecology: Nymphs inhabit clean streams and, oddly for stoneflies, seeps on nearly vertical rock surfaces and fast flowing waterfalls. Often found in submerged mosses, bryophytes, or other leaf litter. Nymphs are predominantly herbivores and either shredders of leaves or detritus. The family has a tolerance value of 2 as rated for the Northwest. Adults emerge in the summer.

Utah Genera:

Yoraperla brevis.

Not present in Utah, but common in the northern Rocky Mountains of Montana and the eastern flank of the Sierra Nevada in California. Emerges from April to August. Larvae present throughout the year.

Figures:



Figure 20. Nymph general body form.
Photo from Invertebrate ID CD.



Figure 21. Adult general body form.
Photo by CRNelson.

FAMILY: PERLIDAE

Morphology (nymphs):

Can be very large.

Glossa much shorter than paraglossa and more pointed.

The paraglossae can be bulbous.

Filamentous, branched gills on thorax, sometimes between cerci as well, but not on first segments of abdomen. (Fig 22)

Ecology: Nymphs inhabit generally clean streams and rivers. This family is much more tolerant of poor water quality than other stoneflies. Many genera and species are restricted to high, well-oxygenated streams and a few lakes. Nymphs are carnivorous predators. This family is rated with a tolerance value of 1 in the Northwest and Mid-Atlantic. Adults emerge in the summer. Most are brown with some yellow markings (Fig. 23). Local species, and many other species from eastern North America come to lights. Western species don't come to lights!

Utah Genera:

- Claassenia sabulosa* (Banks).
Uncommon in northern Utah.
- Acroneuria abnormis* (Newman).
Uncommon. Green river area.
Adults emerge June to September.
- Hesperoperla pacifica* (Banks).
Common, throughout Utah.
- Perlesta placida* (Hagen).
Known from Uintah County. Not confirmed

Figures:

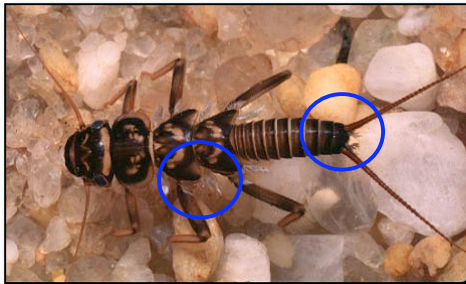


Figure 22. Branched gills on thorax and end of abdomen.
Photo by CRNelson.



Figure 23. Adult general body form.
Photo by CRNelson.

FAMILY: PERLODIDAE

Morphology (nymphs):

- Can be very large.
- Glossa much shorter than paraglossa and more pointed.
- Gills usually absent, but sometimes finger-like on thorax and/or near mentum.** (Fig. 24)
- Often with striking light and dark color patterns. (Fig. 25, 26)
- Similar in general appearance to perlids, but no tufted gills.

Ecology: Nymphs generally inhabit clean streams and rivers. Many genera and species are restricted to high, well-oxygenated streams and a few lakes. Nymphs are predominantly carnivorous predators though are facultative scrapers and collector-gatherers. This family is rated with a tolerance value of 2 in both the Northwest and Mid-Atlantic. Adults emerge in the spring and summer. Most brown with yellow markings.

Utah Genera:

- Cultus aestivalis* (Needham and Claassen)
Uncommon but wide range in Utah: medium to larger streams.
Adults emerge April to June.

Diura knowltoni (Frison)

Common and widespread in Utah: small to medium streams at higher elev.
Adult emerge April to June.

Isogenoides

Common throughout Utah: small stream to large rivers.
Adults emerge March to August.

Utah species:

I. colubrinus (Hagen)

I. elongatus (Hagen)

I. zionensis Hanson.

Isoperla

Common throughout Utah: small stream to large rivers.
Adults emerge April to August.

Utah species:

I. ebria (Hagen)

I. fulva Claassen,

I. longiseta Banks

I. mormona Banks

I. patricia Frison

I. petersoni Needham and Christensen

I. pinta Frison

I. quiquepunctata (Banks)

Kogotus modestus (Banks)

Uncommon but wide range in Utah.
Adults emerge April to September.

Megarcys signata (Hagen)

Common, throughout Utah: small streams.
Adults emerge April to July.

Pictetiella expansa (Banks)

Uncommon, northern Utah.
Adults emerge July to October.

Skwala parallela (Frison)

Common, throughout Utah: medium to large rivers.
Adults emerge February to July.

Figures:

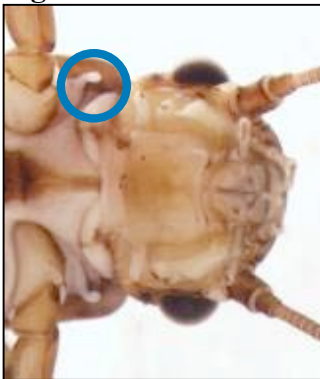


Figure 24. Fingerlike gills.
Photo by SWJudson.



Figure 25. Nymph general form.
Photo by CRNelson.



Figure 26. Adult general form.
Photo by CRNelson.

FAMILY: PTERONARCYIDAE

Morphology (nymphs):

Can be very large. (Fig 27)

Glossa somewhat shorter than paraglossa and more pointed, but not as different from each other as in the Perlidae.

Gills present ventrally on thorax and on the first few segments of the abdomen.
(Fig. 28)

Often with extensions on the prothorax and/or abdomen.

Ecology: Nymphs inhabit generally clean streams and rivers, though most species have high tolerances. Nymphs often found in debris and leaf packs. Many genera and species are restricted to high, well-oxygenated rivers and streams. Trophic habits are predominantly shredding of either detrital or vegetative matter, though some species are also facultative scrapers or predators. Adults emerge in the summer and are brown, with intersegmental membranes often bright orange (Fig. 29).

Utah Genera:

Pteronarcella badia (Hagen)

Common, middle sized and larger rivers throughout Utah.

Emerge from May to July. Larvae present throughout the year.

Pteronarcys

Common, larger rivers throughout Utah.

Larvae present throughout the year.

Utah species:

P. californica (Newport)

P. princeps Banks

Figures:



Figure 27. Nymph general body form
Photo by CRNelson.



Figure 28. Tufted gills on thorax
AND abdomen. Photo from Invertebrate ID CD.



Figure 29. Adult general body form.
Photo by CRNelson.

Literature Cited:

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Stewart, K.W., Stark, B.P. 2002. *Nymphs of North American Stonefly Genera.* 2nd edition. The Caddis Press, Columbus, Ohio. 510 pages.

Editorial History:

2006: L. K. Hapairai, R. L. Johnson: compilation from cited sources

2008: S.W.Judson: addition of information from Merritt and Cummins, addition of figures, compilation of county-by-county species lists

APPENDIX A: County by county Species List

Beaver County

Taeniopterygidae: *Taenionema nigripenne*,

Nemouridae: *Amphinemura mogollonica*, *Malenka coloradensis*,

Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia wanica*, *Capnia utahensis*,
Utacapnia logana

Leuctridae: *Perlomyia utahensis*

Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*

Chloroperlidae: *Suwallia pallidula*, *Utaperla sopladora*

Perlidae: none

Perlodidae: *Isoperla fulva*, *Isoperla mormona*

Box Elder County

Taeniopterygidae: *Taenionema nigripenne*

Nemouridae: *Malenka californica*, *Prostoia besametsa*, *Zapada cinctipes*

Capniidae: *Capnia confusa*, *Isocapnia missourii*

Leuctridae: *Paraleuctra rickeri*, *Perlomyia utahensis*

Pteronarcyidae: *Pteronarcella badia*

Chloroperlidae: *Alloperla severa*

Perlidae: *Hesperoperla pacifica*

Perlodidae: *Skwala americana*, *Isoperla fulva*

Cache County

Taeniopterygidae: *Doddsia occidentalis*, *Taenionema nigripenne*, *Taenionema pacificum*

Nemouridae: *Amphinemura banksi*, *Malenka californica*, *Prostoia besametsa*, *Zapada cinctipes*, *Zapada columbiana*, *Zapada haysi*

Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Capnia vernalis*, *Eucapnopsis brevicauda*, *Isocapnia crinita*, *Isocapnia vedderensis*, *Utacapnia logana*

Leuctridae: *Paraleuctra vershina*, *Perlomyia utahensis*

Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*, *Pteronarcys princeps*

Chloroperlidae: *Suwallia pallidula*, *Sweltsa borealis*, *Sweltsa coloradensis*, *Sweltsa fidelis*, *Sweltsa gaufini*, *Sweltsa lamba*, *Plumiperla diversa*, *Triznaka signata*, *Paraperla frontalis*

Perlidae: *Hesperoperla pacifica*

Perlodidae: *Diura knowltoni*, *Kogotus modestus*, *Skwala americana*, *Isoperla fulva*, *Isoperla patricia*, *Isoperla petersoni*, *Isoperla quinquepunctata*

Carbon County

Capniidae: *Capnia confusa*, *Utacapnia lemoniana*

Perlodidae: *Isogenoides zionensis*

Daggett County

Taeniopterygidae: *Taenionema pacificum*

Nemouridae: *Amphinemura banksi*, *Prostoia besametsa*

Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Utacapnia lemoniana*, *Eucapnopsis brevicauda*

Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*

Chloroperlidae: *Suwallia pallidula*

Perlidae: *Acroneuria abnormis*, *Hesperoperla pacifica*, *Classenia sabulosa*

Perlodidae: *Megaracys signata*, *Skwala americana*, *Isoperla sobria*, *Isoperla longiseta*, *Isoperla mormona*, *Isoperla patricia*

Davis County

Taeniopterygidae: *Taenionema nigripenne*

Nemouridae: *Podmosta delicatula*, *Prostoia besametsa*, *Zapada cinctipes*, *Zapada columbiana*

Capniidae: *Capnia cygna*, *Capnia gracilaria*, *Capnia nana*, *Eucapnopsis brevicauda*

Leuctridae: *Paraleuctra occidentalis*, *Paraleuctra vershina*

Chloroperlidae: *Suwallia pallidula*, *Sweltsa coloradensis*, *Sweltsa lamba*

Perlidae: *Hesperoperla pacifica*

Perlodidae: *Cultus aestivalis*, *Diura knowltoni*, *Megarcys signata*, *Skwala americana*, *Isoperla mormona*

Duschene County

Taeniopterygidae: *Oemopteryx fosketti*, *Taenionema pacificum*

Nemouridae: *Amphinemura banksi*, *Malenka californica*, *Malenka coloradensis*, *Podmosta delicatula*, *Zapada cinctipes*

Capniidae: *Utacapnia lemoniana*, *Capnia gracilaria*, *Capnia vernalis*

Pteronarcyidae: *Pteronarcella badia*,

Chloroperlidae: *Alloperla severa*, *Suwallia lineosa*, *Suwallia pallidula*, *Sweltsa coloradensis*, *Triznaka signata*, *Paraperla frontalis*

Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*

Perlodidae: *Isogenoides zionensis*, *Diura knowltoni*, *Megarcys signata*, *Isoperla sobria*, *Isoperla fulva*, *Isoperla patricia*

Emery County

Taeniopterygidae

Nemouridae: *Amphinemura mogollonica*, *Podmosta delicatula*, *Prostoia besametsa*

Capniidae : *Isocapnia vedderensis*

Leuctridae

Pteronarcyidae: *Pteronarcella badia*

Perlodidae: *Isogenoides zionensis*, *Isoperla petersoni*, *Skwala americana*

Garfield County

Capniidae: *Capnia vernalis*

Pteronarcyidae: *Pteronarcella badia*

Perlidae: *Hesperoperla pacifica*

Perlodidae: *Cultus aestivalis*, *Isogenoides colubrinus*, *Isogenoides zionensis*, *Megarcys signata*, *Isoperla sobria*, *Isoperla fulva*, *Isoperla pinta*

Grand County

Taeniopterygidae: *Taenionema pacificum*

Nemouridae: *Malenka coloradensis*

Perlodidae: *Isoperla longiseta*

Iron County

Nemouridae: *Malenka coloradensis*, *Zapada cinctipes*,

Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia wanica*, *Capnia utahensis*, *Utacapnia logana*

Pteronarcyidae: *Pteronarcella badia*
Chloroperlidae: *Sweltsa coloradensis*, *Sweltsa lamba*,
Perlodidae: *Megarcys signata*, *Isoperla sobria*, *Isoperla patricia*, *Isoperla quinquepunctata*

Juab County

Taeniopterygidae: *Taenionema nigripenne*
Nemouridae: *Malenka californica*
Leuctridae: *Perlomyia utahensis*,
Pteronarcyidae: *Pteronarcys princeps*
Perlidae: *Hesperoperla pacifica*

Kane County

Taeniopterygidae: *Taenionema pacificum*
Nemouridae: *Zapada cinctipes*
Capniidae: *Capnia gracilaria*
Perlodidae: *Isogenoides zionensis*, *Isoperla longiseta*

Millard County

Nemouridae: *Prostoia besametsa*
Capniidae: *Capnia utahensis*, *Capnia gracilaria*, *Utacapnia logana*
Leuctridae: *Perlomyia utahensis*
Pteronarcyidae: *Pteronarcella badia*
Perlidae: *Hesperoperla pacifica*
Perlodidae: *Skwala americana*, *Isoperla fulva*, *Isoperla patricia*, *Isoperla quinquepunctata*

Morgan County

Nemouridae: *Prostoia besametsa*, *Zapada cinctipes*,
Capniidae: *Capnia gracilaria*
Perlodidae: *Skwala americana*

Piute County

Nemouridae: *Prostoia besametsa*
Capniidae: *Eucapnopsis brevicauda*
Perlodidae: *Diura knowltoni*

Rich County

Nemouridae: *Podmosta delicatula*, *Zapada haysi*

Salt Lake County

Taeniopterygidae: *Doddsia occidentalis*, *Taenionema nigripenne*, *Taenionema pacificum*
Nemouridae: *Malenka californica*, *Podmosta delicatula*, *Prostoia besametsa*,
Zapada cinctipes, *Zapada columbiana*, *Zapada haysi*
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Isocapnia missourii*,
Eucapnopsis brevicauda, *Utacapnia lemoniana*, *Utacapnia logana*

Leuctridae: *Paraleuctra jewetti*, *Paraleuctra occidentalis*, *Paraleuctra rickeri*,
Paraleuctra vershina, *Perlomyia utahensis*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Alloperla severa*, *Suwallia pallidula*, *Sweltsa borealis*, *Sweltsa*
coloradensis, *Sweltsa lamba*, *Plumiperla diversa*, *Paraperla frontalis*
Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Cultus aestivalis*, *Diura knowltoni*, *Kogotus modestus*, *Megarcys*
signata, *Pictetiella expansa*, *Skwala americana*, *Isoperla sobria*, *Isoperla*
fulva, *Isoperla patricia*, *Isoperla quinquepunctata*

San Juan County

Taeniopterygidae: *Taenionema pallidum*
Nemouridae: *Amphinemura banksi*, *Malenka coloradensis*, *Zapada cordillera*
Chloroperlidae: *Suwallia pallidula*, *Sweltsa lamba*, *Triznaka pintada*
Perlidae: *Hesperoperla pacifica*
Perlodidae: *Isogenoides colubrinus*, *Kogotus modestus*, *Megarcys signata*, *Skwala*
americana

Sanpete County

Nemouridae: *Amphinemura mogollonica*, *Zapada cinctipes*, *Zapada haysi*
Pteronarcyidae: *Pteronarcella badia*
Perlodidae: *Skwala americana*, *Isoperla fulva*

Sevier County

Nemouridae: *Amphinemura mogollonica*, *Malenka coloradensis*, *Prostoia*
besametsa, *Zapada cinctipes*, *Zapada haysi*
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia vernalis*, *Capnia*
utahensis, *Capnia wanica*, *Isocapnia crinita*, *Utacapnia lemoniana*,
Utacapnia logana
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Suwallia pallidula*, *Sweltsa borealis*, *Plumiperla diversa*,
Triznaka signata
Perlidae: *Hesperoperla pacifica*
Perlodidae: *Isoperla fulva*, *Isoperla mormona*, *Isoperla patricia*

Summit County

Taeniopterygidae: *Taenionema pacificum*,
Nemouridae: *Amphinemura banksi*, *Malenka californica*, *Podmosta decepta*,
Podmosta delicatula, *Zapada cinctipes*, *Zapada columbiana*, *Zapada*
haysi
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Isocapnia crinita*,
Isocapnia vedderensis, *Utacapnia lemoniana*, *Utacapnia logana*
Leuctridae: *Paraleuctra vershina*, *Perlomyia utahensis*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Suwallia lineosa*, *Suwallia pallidula*, *Sweltsa borealis*, *Sweltsa*
coloradensis, *Sweltsa lamba*, *Plumiperla diversa*, *Triznaka pintada*,
Triznaka signata, *Paraperla frontalis*, *Utaperla sopladora*

Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Cultus aestivalis*, *Isogenoides elongatus*, *Megarcys signata*, *Skwala americana*, *Isoperla fulva*, *Isoperla patricia*, *Isoperla pinta*

Tooele County

Nemouridae: *Prostoia besametsa*, *Zapada cinctipes*, *Zapada haysi*
Capniidae: *Capnia gracilaria*, *Eucapnopsis brevicauda*, *Isocapnia hyalite*
Pteronarcyidae: *Pteronarcella badia*
Chloroperlidae: *Alloperla severa*, *Suwallia pallidula*, *Sweltsa coloradensis*
Perlidae: *Hesperoperla pacifica*
Perlodidae: *Isoperla fulva*, *Megarcys signata*, *Isoperla patricia*

Uintah County

Taeniopterygidae: *Oemopteryx foscetti*, *Taenionema nigripenne*
Nemouridae: *Amphinemura banksi*, *Zapada cinctipes*
Capniidae: *Capnia vernalis*, *Utacapnia poda*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Alloperla severa*, *Suwallia lineosa*, *Suwallia pallidula*, *Triznaka signata*
Perlidae: *Acroneuria abnormis*, *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Isogenoides colubrinus*, *Isoperla fulva*, *Isoperla longiseta*, *Isoperla patricia*, *Isoperla pinta*

Utah County

Taeniopterygidae: *Doddsia occidentalis*, *Taenionema nigripenne*, *Taenionema pacificum*
Nemouridae: *Amphinemura banksi*, *Malenka californica*, *Prostoia besametsa*, *Zapada cinctipes*, *Zapada columbiana*, *Zapada haysi*
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Capnia utahensis*, *Capnia vernalis*, *Eucapnopsis brevicauda*, *Isocapnia crinita*, *Isocapnia grandis*, *Isocapnia vedderensis*, *Isocapnia hyalita*, *Utacapnia lemoniana*, *Utacapnia logana*
Leuctridae: *Paraleuctra occidentalis*, *Perlomyia utahensis*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Alloperla severa*, *Suwallia pallidula*, *Sweltsa borealis*, *Sweltsa coloradensis*, *Plumiperla diversa*, *Triznaka signata*, *Paraperla frontalis*
Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Diura knowltoni*, *Isogenoides elongatus*, *Isogenoides zionensis*, *Megarcys signata*, *Pictetiella expansa*, *Skwala americana*, *Isoperla fulva*, *Isoperla mormona*, *Isoperla patricia*, *Isoperla pinta*

Wasatch County

Taeniopterygidae: *Taenionema nigripenne*, *Taenionema pacificum*
Nemouridae: *Amphinemura banksi*, *Malenka californica*, *Podmosta delicatula*, *Prostoia besametsa*, *Zapada cinctipes*
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Isocapnia crinita*, *Utacapnia lemoniana*, *Eucapnopsis brevicauda*, *Utacapnia logana*

Leuctridae: *Paraleuctra occidentalis*, *Paraleuctra vershina*,
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*, *Pteronarcys princeps*
Chloroperlidae: *Alloperla severa*, *Suwallia pallidula*, *Sweltsa borealis*, *Sweltsa coloradensis*, *Sweltsa lamba*, *Plumiperla diversa*, *Triznaka signata*, *Paraperla frontalis*, *Utaperla sopladora*
Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Cultus aestivalis*, *Diura knowltoni*, *Kogotus modestus*, *Megarcys signata*, *Skwala americana*, *Isoperla sobria*, *Isoperla fulva*, *Isoperla mormona*, *Isoperla patricia*, *Isoperla petersoni*, *Isoperla pinta*, *Isoperla quinquepunctata*

Washington County

Taeniopterygidae: *Taenionema pacificum*
Nemouridae: *Amphinemura mogollonica*, *Malenka coloradensis*, *Zapada cinctipes*
Capniidae: *Capnia wanica*, *Capnia gracilaria*, *Capnia utahensis*, *Mesocapnia frisoni*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Sweltsa lamba*
Perlidae: *Hesperoperla pacifica*
Perlodidae: *Isogenoides zionensis*, *Isoperla sobria*, *Skwala americana*

Wayne County

Pteronarcyidae: *Pteronarcys californica*
Perlodidae: *Isogenoides zionensis*, *Isoperla mormona*

Weber County

Taeniopterygidae: *Taenionema nigripenne*, *Taenionema pacificum*
Nemouridae: *Malenka californica*, *Prostoia besametsa*, *Zapada cinctipes*
Capniidae: *Capnia confusa*, *Capnia gracilaria*, *Capnia nana*, *Isocapnia crinita*, *Utacapnia lemoniana*, *Eucapnopsis brevicauda*, *Utacapnia logana*
Leuctridae: , *Paraleuctra vershina*
Pteronarcyidae: *Pteronarcella badia*, *Pteronarcys californica*
Chloroperlidae: *Sweltsa coloradensis*, *Sweltsa lamba*
Perlidae: *Hesperoperla pacifica*, *Classenia sabulosa*
Perlodidae: *Cultus aestivalis*, *Isogenoides colubrinus*, *Isogenoides elongatus*, *Megarcys signata*, *Skwala americana*, *Isoperla fulva*, *Isoperla mormona*, *Isoperla patricia*