Supplementary Material

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| **Supplemental Table S1** Life history, mobility, morphology, and ecology traits of macroinvertebrates and their classification standards. |
| **Trait** | Trait state(modality) | Code |
| **Life history** |  |  |
| Voltinism | Semivoltine(1<generation/y) | Volt 1 |
|  | Univoltine | Volt 2 |
|  | Bi-or multivoltine(≧1 generation/y) | Volt 3 |
| **Ecology** |  |  |
| Rheophily | Depositional only | Rheo 1 |
|  | Depositional and erosional | Rheo 2 |
|  | Erosional | Rheo 3 |
| Thermal preference | Cool eurythermal | Ther 1 |
|  | Cool/warm eurythermal | Ther 2 |
|  | Warm eurythermal | Ther 3 |
| Habits | Burrow | Habi 1 |
|  | Climb | Habi 2 |
|  | Sprawl | Habi 3 |
|  | Cling | Habi 4 |
|  | Swim | Habi 5 |
| Trophic habits  | Collector-gatherers | Trop 1 |
|  | Collector-filterers | Trop 2 |
|  | Herbivore | Trop 3 |
|  | Predators | Trop 4 |
|  | Shredders | Trop 5 |
| **Mobility** |  |  |
| Occurrence in drift | Rare(catastrophic) | Drft 1 |
|  | Common(typically observed) | Drft 2 |
|  | Abundant(dominant in drift samples) | Drft 3 |
| Swimming ability | None | Swim 1 |
|  | Weak | Swim 2 |
|  | Strong | Swim 3 |
| **Morphology** |  |  |
| Attachment  | None | Atch 1 |
|  | Some | Atch 2 |
|  | Both | Atch 3 |
| Shape | Streamlined | Shpe 1 |
|  | Not streamlined | Shpe 2 |
| Size at maturity | Small(<9mm) | Size 1 |
|  | Medium(9-16mm) | Size 2 |
|  | Large(>16mm) | Size 3 |

**Supplemental Table S2** Number of individuals of macroinvertebrate taxa in the FP, MP, and AM (mean ± SE).

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| TAXA | Macroinvertebrate richness |
| FP | MP | AM |
| *Amphinemura* sp. | 1.00±1.26 | 1.00±0.63 | 4.00±1.41 |
| *Podmosta* sp. | 0.00±0.00 | 0.00±0.00 | 3.20±0.75 |
| *Nemoura* sp. | 8.80±3.06 | 3.40±1.02 | 1.60±0.49 |
| *Leuctra* sp. | 1.20±1.60 | 4.60±1.02 | 2.00±1.26 |
| *Chloroperla* sp. | 8.00±4.34 | 5.20±1.17 | 2.60±1.02 |
| *Suwallia* sp. | 7.20±3.66 | 4.80±0.75 | 3.80±1.17 |
| *Sweltsa* sp.  | 8.80±2.14 | 6.00±1.41 | 3.20±1.60 |
| *Haploperla* sp.  | 3.20±3.97 | 1.60±0.80 | 3.40±1.02 |
| *Kamimuria* sp. | 0.00±0.00 | 0.00±0.00 | 3.00±1.10 |
| *Oyamia* sp. | 0.00±0.00 | 0.00±0.00 | 2.80±0.75 |
| *Stavsolus* sp. | 1.80±1.47 | 2.00±0.63 | 5.20±1.72 |
| *Megarcys* sp. | 0.00±0.00 | 0.00±0.00 | 4.00±1.10 |
| *Ephemerella* sp. | 10.40±2.87 | 5.20±0.75 | 4.00±1.41 |
| *Cincticostella* sp.  | 1.00±1.26 | 1.80±0.40 | 6.20±1.33 |
| *Ephacerella* sp.  | 0.00±0.00 | 0.00±0.00 | 2.80±1.72 |
| *Uracanthella* sp.  | 0.60±0.80 | 0.00±0.00 | 4.80±1.33 |
| *Drunella* sp. | 1.00±0.89 | 0.00±0.00 | 3.80±1.72 |
| *Epeorus* sp. | 8.80±4.62 | 1.80±0.40 | 2.80±0.75 |
| *Heptagenia* sp. | 12.80±4.53 | 11.20±1.33 | 12.40±4.32 |
| *Caenis* sp. | 3.20±3.43 | 0.00±0.00 | 6.00±1.41 |
| *Ameletus* sp. | 0.80±0.98 | 1.20±0.98 | 4.60±1.85 |
| *Paraleptophlebia* sp. | 10.60±2.58 | 5.80±1.94 | 4.40±1.02 |
| *Mystrophora* sp. | 0.00±0.00 | 0.00±0.00 | 4.40±1.85 |
| *Glossosoma* sp. | 2.60±3.32 | 0.00±0.00 | 3.00±0.89 |
| *Arctopsyche* sp. | 2.20±1.33 | 1.60±0.49 | 4.20±1.72 |
| *Hydropsyche* sp. | 2.60±2.80 | 1.40±0.49 | 4.60±1.36 |
| *Potamyia* sp. | 2.00±1.26 | 1.20±0.75 | 7.00±1.41 |
| *Desmona* sp. | 2.00±1.67 | 1.00±0.63 | 5.00±0.89 |
| *Apatania* sp. | 2.80±2.32 | 1.40±0.49 | 5.00±1.41 |
| *Cyrnellus* sp. | 1.40±1.20 | 1.20±0.75 | 2.80±0.75 |
| *Nyctiophylax* sp. | 1.60±1.36 | 0.00±0.00 | 4.20±0.75 |
| *Stenophylax* sp. | 0.00±0.00 | 0.00±0.00 | 4.40±1.02 |
| *Ecnomus* sp. | 0.80±0.98 | 0.00±0.00 | 3.40±1.50 |
| *Brachycentrus* sp. | 0.00±0.00 | 0.00±0.00 | 0.20±0.40 |
| *Cercion* sp. | 1.40±1.20 | 0.00±0.00 | 3.40±1.02 |
| *Antocha* sp. | 1.00±1.26 | 1.20±0.40 | 4.20±1.33 |
| *Paratriclodadius* sp. | 4.20±2.56 | 3.00±0.63 | 7.60±1.50 |
| *Orthocladius* sp. | 2.40±2.06 | 4.20±1.33 | 5.20±1.72 |
| *Chaetocladius* sp. | 0.00±0.00 | 0.00±0.00 | 5.80±1.17 |
| *Chironomus* sp. | 8.20±0.75 | 6.00±1.79 | 13.00±1.41 |
| *Gammarus* sp. | 1.80±1.60 | 1.40±0.49 | 2.80±0.75 |