

Proposed Freshwater Invertebrate Laboratory Practices and What to Expect from Your Bug Lab

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*Salmoperla
sylvanica*

Talk outline

- Overview of the BMI laboratory.
- Important considerations and practices/procedures to produce future comparable data sets.



*Calliperla
luctuosa*

Overview of the BMI Laboratory

- Lab Staff and Resources
- Sample Receipt
- Sample Preparation
- Identification and Enumeration of BMI's
- Internal Quality Control of BMI Data
- Storage of BMI Samples and Remnants



*Cosumnoperla
hypocrena*

Lab Staff & Resources

Taxonomist qualifications

Taxonomist must be active SAFIT member and attend training activities.

Also Recommended: Minimum Bachelor's Degree in Entomology, Zoology or similar degree with relevant coursework



*Cultus
tostonus*

Lab Staff & Resources

Reference collection

Labs should maintain an internal reference collection of vouchered specimens with confirmed ID's



*Isoperla
adunca*

Lab Staff & Resources

Taxonomic reference library

Staff should have access to up to date taxonomic information including keys, species descriptions, biogeographic distributions, etc.



*Isoperla
baumanni*

Lab Staff & Resources

General Laboratory Practices

Labs should maintain a laboratory SOP detailing all the materials and methods used.



*Isoperla
bifurcata*

Lab Staff & Resources

Standard Taxonomic Effort (STE)

The minimum taxonomic resolution should conform to the standard taxonomic effort levels specified by the project manager.
Ex. SWAMP uses SAFIT Level 1 and Level 2 standard effort.



*Isoperla
bifurcata*

Laboratory Sample Receipt

Sample documentation check

Labs should confirm that sample labels match chain of custody forms and all samples are accounted for. Confirm that any required ancillary sample information is present.



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Laboratory Sample Receipt

Sample Integrity Check

Labs should ensure all sample jars are intact, have no more than 50% (by volume) of sample material, and are filled to the top with 70% ethanol .



*Isoperla
marmorata*

Laboratory Sample Receipt

Hydrometer Preservation Check

Samples must contain a minimum of 70% ethanol. Check 10% of samples by project (or no fewer than one container per shipment). If failures are found, the entire batch must be checked.



*Isoperla
marmorata*

Laboratory Sample Receipt

Sample Database Login and Laboratory
Sample Identification

Labs should develop a system to aid in
sample tracking and data management.



*Isoperla
miwok*

Sample Preparation

BMI Sample Cleaning

Labs should wash fine sediment from samples prior to subsampling.



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sp.?

Sample Preparation

Subsampling of BMI samples

Labs should remove a random subsample of at least the target count of BMI's from the surrounding matrix of detritus using a gridded tray or other random sub-sampling device.

A minimum of 3 separate grids -OR- at least 25% of the total sample material (volume) should be processed to ensure representativeness of the sub-sample.

Sample Preparation

Quality Control of Picking/Sorting process

Labs should perform QC checks for picking effectiveness on at least 10% of sample remnants per project.



*Isoperla
sobria*

Identification and Enumeration of BMI specimens

Determination and Enumeration of Non-Chironomidae

Taxonomists should identify at least the target count of BMI to appropriate SAFIT STE Level.

Taxonomists should also indicate the developmental stage (larva, pupa, adult, or X for non-insect taxa) for each Final ID.

Identification and Enumeration of BMI specimens

Determination and Enumeration of
Chironomidae

Identify at least the target count of BMI to
appropriate SAFIT STE Level.

Taxonomists should also indicate the
developmental stage (larva, pupa, adult)
for each Final ID.

Identification and Enumeration of BMI specimens

Deviations from STE

Any deviation from SAFIT taxonomic effort levels should be accompanied by explanation codes (e.g., immature specimens, damaged specimens, etc.)

Identification and Enumeration of BMI specimens

Reporting unique taxa that cannot be named

Taxonomists should distinguish distinct taxa
and voucher in separate vials



*Isoperla
tilasqua*

Identification and Enumeration of BMI specimens

Slide Mounting, Clearing Specimens or
Dissected Structures for Identification

Taxonomists should perform as needed to
properly identify specimens.

Identification and Enumeration of BMI specimens

Adding Qualified Specimens to a Laboratory
Reference Collection

Labs should document reference collection
holdings.

Identification and Enumeration of BMI specimens

Sample Archiving

Identified organisms should be archived with at least one vial per final ID. Each vial must contain complete locality and determination labels.

Additionally, locality labels should include unique sample tracking number.

Internal Quality Control of BMI Data

Internal QC procedures

Laboratories should have a written SOP describing internal quality control check procedures.

And perform quality control checks on at least 1 sample, or 10% of samples per project.

Storage of BMI Samples and Sample Remnants

Minimum storage requirements

Labs should keep vials of identified organisms for 5 years or longer. Sorted sample residue keep for 1 year. Unsorted sample remainder keep for 2 years.



*Magarcys
subtruncata*

Questions?

- This preliminary information will be available in the SWAMP Laboratory SOP which is projected to be available sometime early next year.



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