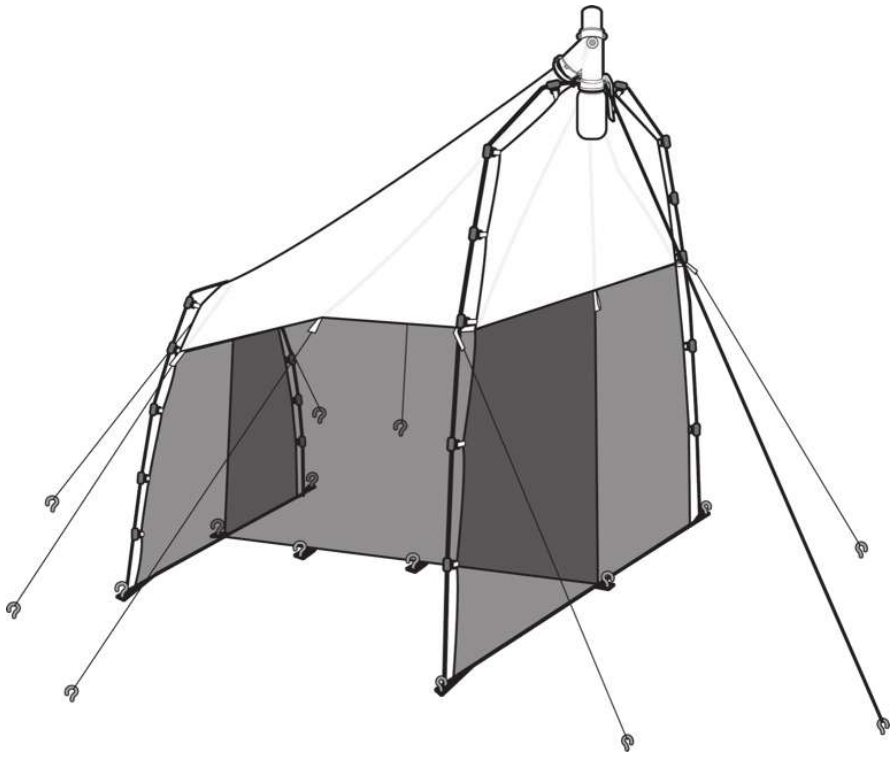
Centre for Biodiversity Genomics

Global Malaise Program

Malaise Trap Sampling

Standard Operating Procedures — Heat Seal Bags



Record your Trap ID here for reference (from the Trap ID label in your kit) **T _ _ _ _ _**	**Contacts** Trap, field and shipping questions: **info@globalmalaise.org**

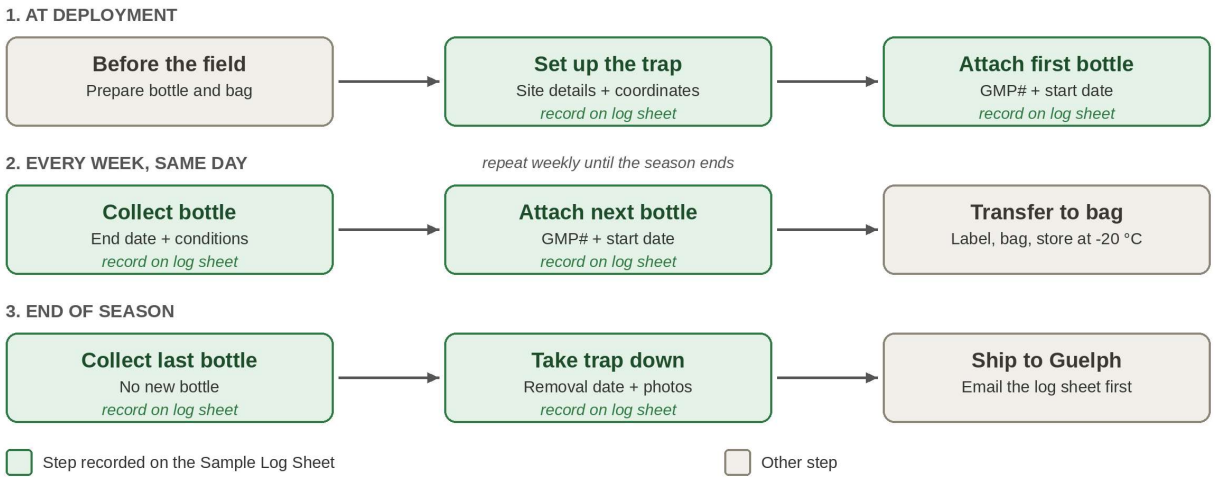
Digital copies of this SOP and the Sample Log Sheet
Latest versions on the Global Malaise website.
globalmalaise.org/resources/sops

OVERVIEW

NOTE **Record everything on the Sample Log Sheet.** Every bottle, date, trap and bottle condition and note goes on the log sheet, which is returned to CBG before shipping. Look for the LOG SHEET tag on each step.

Section	Key points	Page
Sampling kit	Kit contents checklist; what you supply	3
Site selection	Permits; habitat; positioning on a flight path	4
Before the field	Watch the video; prepare the first bottle and bag	5
Trap assembly	Poles, trap head, stakes, guy lines; final check	6–8
Deployment	Site details and coordinates, first bottle, site photos	9
Weekly collection	Collect bottle, attach next bottle, trap checks	10
Sample transfer	Decant and transfer into the labelled bag	11
Storage and bottle reuse	-20 °C storage; bottle and label rotation	12
End of season	Final bottle, removal photos, take the trap down	13
Before you ship	Check log sheet; export rules; notify CBG	14
Prepare samples	Remove ethanol; IATA limits; heat sealing	15–16
Pack and ship	Double bag, box, mark, customs, address	17
Troubleshooting	Trap and sample problems; FAQ	18
Your samples and data	Processing, ownership, data release	19
Shipment checklist	Check-off summary for shipping day	20

Sampling workflow



1 SAMPLING KIT

Check your kit against this list when it arrives. Contact info@globalmalaise.org if anything is missing.

Paperwork (also emailed by shipping@ccdb.ca)

- ☐ This SOP (PDF)
- ☐ Sample Log Sheet: printed copy + Excel file
- ☐ Biological Material Transfer Policies
- ☐ Customs Declaration Form
- ☐ Sample shipment checklist

Equipment

- ☐ 1 Malaise trap kit (see photo)
- ☐ 1 Trap ID label + zip ties
- ☐ 4 × 500 mL collection bottles
- ☐ 1 decanting lid (spare coupling ring)
- ☐ 2 Nitex filters
- ☐ Plastic pipettes
- ☐ 55 × 500 mL heat seal sample bags
- ☐ GMP label sets: **2 identical external stickers** + 1 internal fluid-paper label per GMP#
- ☐ Shipping stickers (A180 marking, address)

Supplied by you

- ☐ 95% ethanol (no substitutes)
- ☐ Ethanol waste container
- ☐ Ethanol squirt bottle
- ☐ Standard household freezer (-20 °C)
- ☐ GPS or phone with GPS (for site coordinates)
- ☐ Pencil and scissors
- ☐ Bag-holding container (e.g. 2 L plastic bottle cut in half)
- ☐ Heat sealer (may be provided, depending on project size)
- ☐ Absorbent material (e.g. paper towels) and return shipping box
- ☐ 2 × 6–8 ft posts (optional, for windy sites)
- ☐ Mallet (optional)
- ☐ Foil (for sunnier sites)

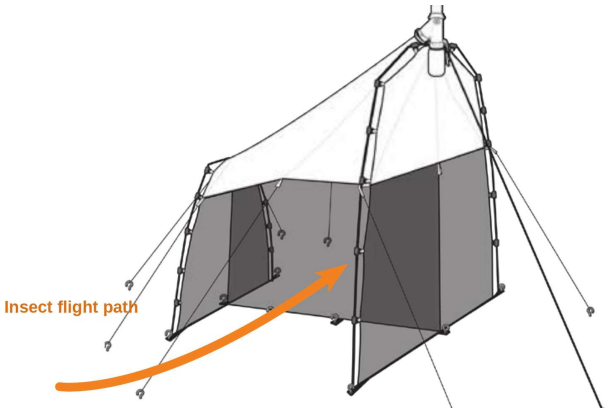


Malaise trap kit.

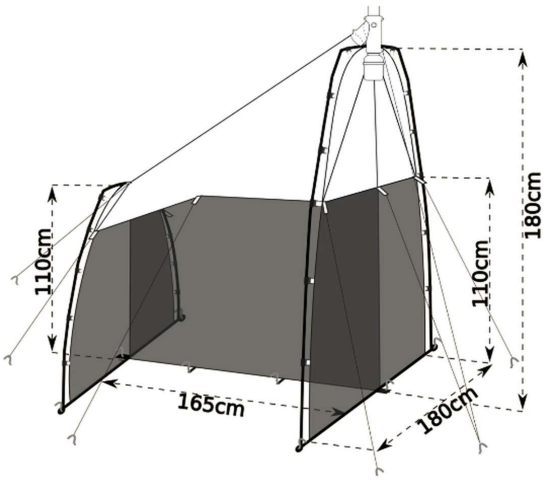
2 SITE SELECTION

Choose the site before deployment day.

1. **Get permission first.** Obtain all required specimen collecting permits and landowner or site-manager permissions before deploying. Check export requirements in your country now, since permits can take time (see Before you ship, p. 14).
2. **Choose minimally disturbed habitat.** A site in the habitat's climax vegetation is ideal, for example a national park or other protected area. An ecoregion not yet sampled in your country adds the most value.
3. **Pick a spot you can reach every week.** Bottles are changed on the same day each week, so the site must be safe and practical to visit weekly for the whole season. Keep clear of mowing, landscaping and other site activities.
4. **Position the trap across a flight path.** Insects follow corridors such as forest edges, clearings, trails, animal paths and streams. Place the trap at a right angle to that path so the middle mesh panel blocks it; insects then fly up into the bottle (see drawing).
5. **Choose flat ground with low vegetation.** Tall or dense plants at the trap opening block insects. Elevated sites are recommended, but very open, exposed sites risk wind damage.
6. **Reduce the risk of disturbance.** Avoid places with likely wildlife damage or vandalism. The trap stays at one site for the whole season, so choose carefully; if problems persist, contact info@globalmalaise.org before moving it.



Place the middle panel across the flight path.



Footprint about 165 × 180 cm; the tall front end holds the trap head.

WHY THIS MATTERS Sites are compared across the global network. Consistent placement (habitat, orientation, weekly timing) is what makes those comparisons valid.

3 BEFORE THE FIELD

Do this at home or the office before deployment day.

What you'll need

- ☐ Internet connection (for the video)
- ☐ Trap kit
- ☐ 1 collection bottle + 1 heat seal bag
- ☐ 95% ethanol
- ☐ GMP label set (lowest number)

What you'll do

1. **Watch the trap deployment video** (QR code below, or youtube.com). It shows an older trap design, but most tips still apply.
2. **Prepare the first bottle.** Fill one 500 mL collection bottle with 95% ethanol. Do not substitute other alcohols or preservatives.
3. **Label the bottle and its bag together.** Take the lowest-numbered GMP label set. Stick one sticker on the bottle and the other on the **bottom half of an empty, dry heat seal bag**; put the matching **internal label** inside the bag. Keep the bag in a safe place until transfer.

> **NOTE** Four bottles rotate through the season. Each time a bottle is reused it gets a **new** GMP label (p. 12), so every sample has its own number.

Trap deployment video
Watch before your first deployment.
www.youtube.com/watch?v=sU9rW71f5ZA&t=9s

4 TRAP ASSEMBLY (1 OF 3)

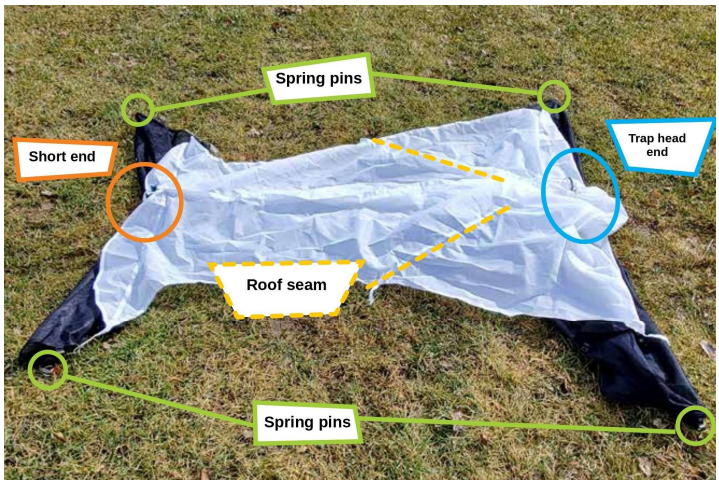
Ideally done by two people. Allow for about 30 minutes.

What you'll need

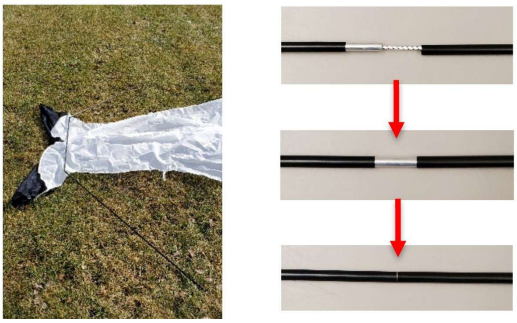
- ☐ Malaise trap kit (carrying bag)
- ☐ Mallet (optional)
- ☐ 2 × 6–8 ft posts (optional)
- ☐ Zip ties or rope (optional)

What you'll do

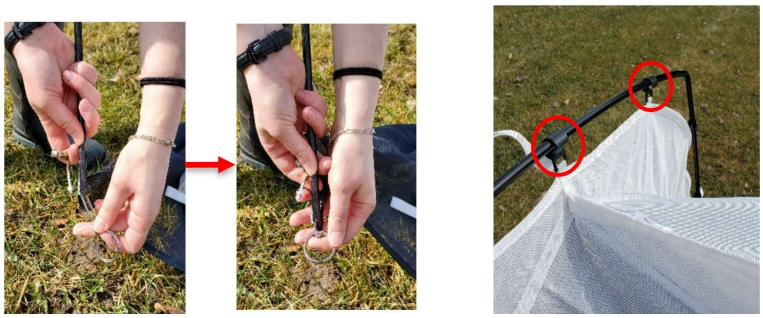
1. Bring the carrying bag with all components to the site.
2. Unfold the trap body and lay it flat on the ground, **white side up**.



3. Assemble the short and long shock-corded poles. Make sure the narrow end of each section is fully seated in the next section.



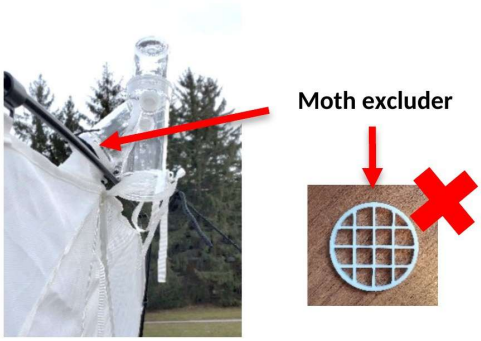
4. Push the **spring pins** at the front corners of the trap into the ends of the **long pole**. Clip the hooks sewn onto the trap around the pole to form a mesh panel. Repeat at the back with the **short pole**.



4 TRAP ASSEMBLY (2 OF 3)

1. With two people, stand up both mesh panels, holding the tops of the poles. The inverted Y-shaped **trap head** must sit over the long pole; fasten it with the **white strap** already attached to the trap. Check that the **moth excluder** has been removed from the trap head; if not, push and twist it out.





2. **Trap head guy line:** tie a guy line to the **lower attachment point** on the trap head (see close-up, p. 9) and stake it to the ground in front of the trap.
3. At the short end, tie a guy line to the white loop on the trap and stake it to the ground.
4. Stretch the base fully and stake it down with the alloy pins and plastic X-stakes: **8 in total**, including the 2 points in the middle panel.





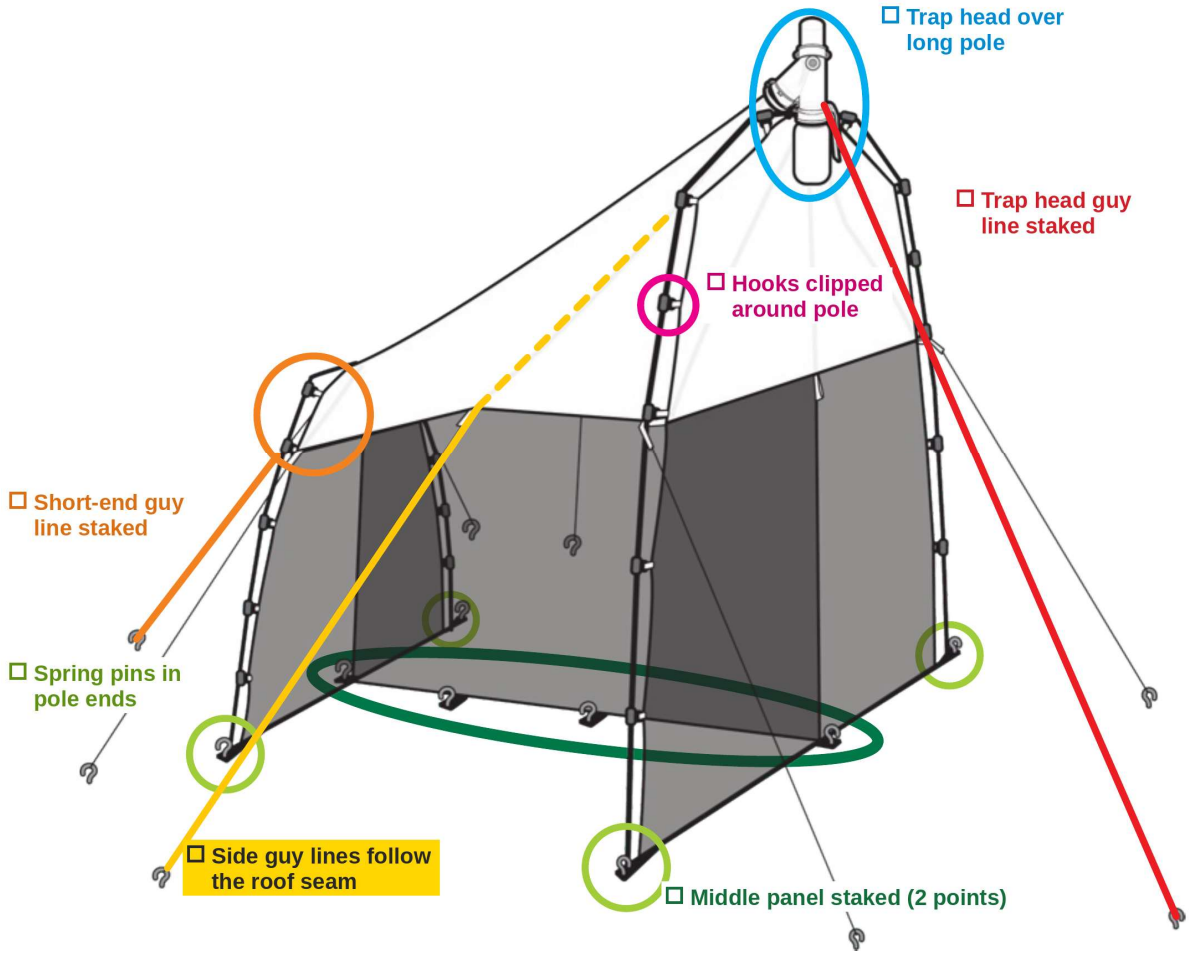
5. Attach and stake the remaining guy lines (8 in total, including the two above), so the trap holds its shape under tension. On the sides, follow the **seam line on the white roof**; this funnels insects up to the trap head. Front and back lines can be tied to trees instead.





4 TRAP ASSEMBLY (3 OF 3): FINAL CHECK

Before you leave the site, check every point below. A reviewer will look for the same points in your site photo.



WHY THIS MATTERS A loose or twisted trap catches fewer insects, and an untied trap head can let the bottle tip and leak. Tension along the roof seam is what guides insects up into the bottle.

NOTE **Optional, for windy or exposed sites:** attach the trap to an 8 ft post at the front and a 6 ft post at the back with zip ties or rope (photo below). Add flagging tape to guy lines in busy areas to prevent tripping.



5 DEPLOYMENT

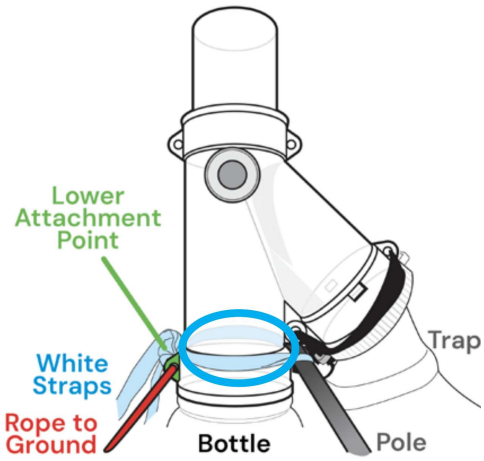
Record the site details and coordinates while standing at the trap.

What you'll need

- ☐ Assembled trap
- ☐ Trap ID label + zip ties
- ☐ Labelled bottle with 95% ethanol
- ☐ GPS or phone with GPS
- ☐ Sample Log Sheet + pencil
- ☐ Camera or phone
- ☐ Foil (sunny sites)

What you'll do

1. **Attach the Trap ID label** to the front (tall) pole, close to the trap head, using the zip ties.
2. **Log sheet header:** fill in the Trap ID, collector, site name and description, habitat, ecoregion and deployment date. Standing at the trap, record **latitude and longitude in decimal degrees** and **elevation in metres** from a GPS or phone. LOG SHEET
3. **Attach the bottle** to the open end of the trap head and tie it with the white straps. Keep the trap head and bottle upright. At sunny sites, wrap the bottle (not the trap head) in foil to protect the DNA from UV.







4. **Log sheet:** start the Week 1 row with the bottle's GMP# and the start date. LOG SHEET
5. **Take site photos:** the whole trap, and the trap within its surroundings. Email them to **info@globalmalaise.org** with subject "T00001 – deployment photo" (your Trap ID), files named `TrapID_YYYY-MM-DD`. Check off "photo sent – deployment" on the log sheet.

6 WEEKLY COLLECTION

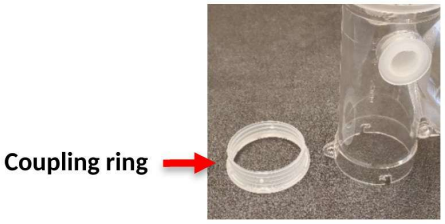
Collect on the same day every week. Each visit: collect the full bottle and attach the next one.

What you'll need

- ☐ Next bottle (95% ethanol, GMP sticker on) and its labelled bag
- ☐ Lid for the collected bottle
- ☐ Sample Log Sheet + pencil

What you'll do

1. Unscrew the full bottle from the trap head and cap it. Make sure the **coupling ring stays on the trap head**; re-attach it if it comes off.



2. **Log sheet:** on that week's row, enter the end date, the **Trap Condition** and **Bottle Condition** codes (table below) and any notes. LOG SHEET
3. Screw on the next bottle and tie it with the white straps. Start the next row on the log sheet with its GMP# and the start date. LOG SHEET
4. **Inspect the trap:** tension, tears, stakes, guy lines and anything blocking the trap head. In the first weeks, and whenever bottles fill fast, check more often (ethanol and catch level). After strong wind or heavy rain, check as soon as possible and top up ethanol if needed. For repairs or replacement parts, contact **info@globalmalaise.org**.
5. Take the full bottle back and transfer it to a bag the same day (p. 11).

Trap Condition codes	Bottle Condition codes
OK OK – Trap upright and operating normally **Issue 1 Sagged/loose** – Structure drooping but still standing **Issue 2 Partially damaged** – Minor damage (tear, bent pole, loose support rope) but still functioning **Issue 3 Fallen/collapsed** – Trap down or non-functional **Issue 4 Broken/major damage** – Significant structural failure **Issue 5 Missing/removed** – Trap gone, vandalized or removed **Issue 6 Other** – Describe in notes	**OK OK/Functional** – Bottle intact, preservative level normal **Issue 1 Full** – Bottle at or near capacity **Issue 2 Contents spilled over** – Sample lost or spilled **Issue 3 Low/evaporated liquid** – Preservative low or empty **Issue 4 Missing** – Bottle absent, stolen or removed **Issue 5 Other** – Describe in notes

NOTE On the log sheet, write the short code: **OK** or the issue number (e.g. **3**). Describe any "Other" or issue in the notes.

7 SAMPLE TRANSFER

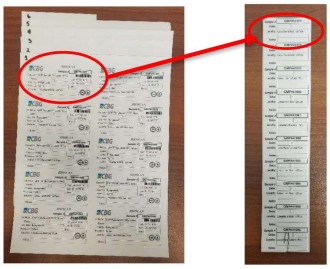
Move each collected sample from its bottle into a heat seal bag for storage and shipping.

What you'll need

- ☐ Collected bottle and its labelled bag
- ☐ Decanting lid + Nitex filter
- ☐ Ethanol waste container
- ☐ Squirt bottle of 95% ethanol
- ☐ Bag-holding container
- ☐ Pencil

What you'll do

1. **Check the match.** The GMP# label on the bottle must match the GMP# label on the bag and the internal label inside the bag.
2. Take the internal label out of the dry bag. Using **PENCIL**, write the collection dates (start–end) and any notes on the internal label and on the bag sticker, then put the internal label back **inside** the bag.



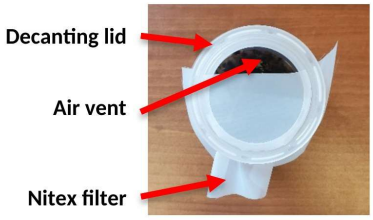
External (sticker) labels

Internal (fluid) labels



Sticker label goes on bottom of bag and MATCHING fluid label goes inside bag.

3. Fit the decanting lid and Nitex filter. Drain a little more than half the ethanol (about 200 mL) into the waste container, leaving the specimens covered. Scan the QR code for a short video.







Decanting video

4. Swirl the bottle to suspend the insects and pour everything into the bag, standing in the holder. Rinse any specimens left on the bottle or filter into the bag with ethanol. **Do not remove any specimens** (this keeps samples comparable across sites). Clean the filter before reusing it.







8 STORAGE AND BOTTLE REUSE

1. Squeeze the air out of the bag and close the zipper lock. Store bags **upright** and do not fold the tops until they are heat sealed.

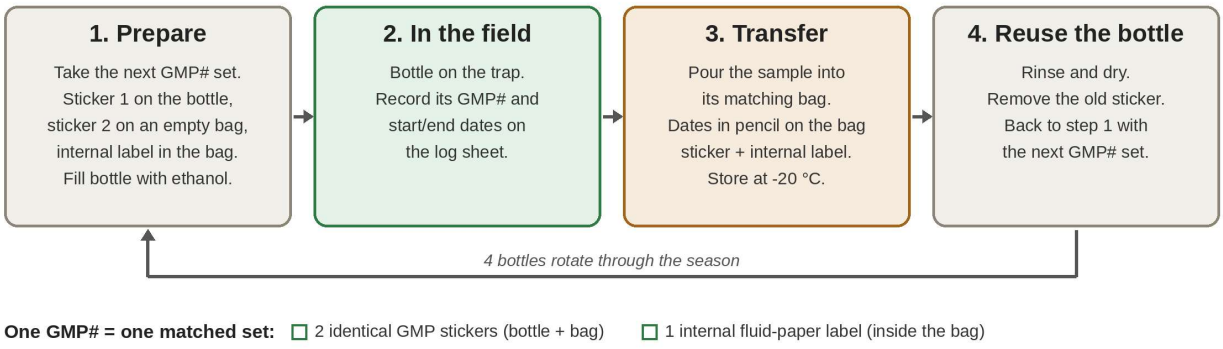


2. Store bags in a **standard household freezer at -20 °C**. In a freezer, bags can hold minimal ethanol and may be heat sealed straight away (p. 16). In a refrigerator, the whole insect mass must stay submerged.
3. **Reuse the bottle:** rinse it with ethanol and let it dry. **Remove the old GMP label**. If the label can't be removed, cover it completely with a new one. Then prepare it with the next GMP label set and its bag, as on p. 5 (step 7), and refill with 95% ethanol.

CRITICAL Freezer storage at -20 °C is critical for DNA. Light, heat or changing temperatures degrade DNA and can make samples unusable. Any other storage arrangement must be agreed with CBG **before** sampling starts.

WHY THIS MATTERS Each GMP# belongs to one sample only. An old label left on a bottle can be mistaken for the next sample's number.

Bottle and label rotation



9 END OF SEASON

Do the last collection and take the trap down on the same visit.

What you'll need

- ☐ Sample Log Sheet + pencil
- ☐ Bottle lid
- ☐ Camera or phone
- ☐ Trap carrying bag

What you'll do

1. Collect the final bottle as usual and complete its row on the log sheet. **Do not** attach a new bottle. LOG SHEET
2. **Take removal photos** before taking the trap down: the whole trap, and the trap within its surroundings. Email them to **info@globalmalaise.org** with subject "T00001 – removal photo" (your Trap ID), files named `TrapID_YYYY-MM-DD`. Check off "photo sent – removal" on the log sheet.
3. **Log sheet:** write the trap removal date in the header. LOG SHEET
4. Take the trap down. Make sure it is **completely dry** and free of debris before packing it into the carrying bag with all poles, stakes and guy lines. Keep the trap label with the kit.

10 BEFORE YOU SHIP

Complete these steps before packing anything.

What you'll need

- ☐ Completed Sample Log Sheet
- ☐ Excel copy of the log sheet
- ☐ Removal photos
- ☐ Your country's export requirements

What you'll do

1. **Check the log sheet.** Every GMP# has its start and end dates and conditions filled in.
2. **Digitize the log sheet** by entering it into the Excel file provided. A blank copy can be downloaded from the Global Malaise website.

Global Malaise website
Digital Sample Log Sheet (Excel) and this SOP.
globalmalaise.org/resources/sops

3. **Check export requirements first.** Find out what your country needs to export dead, preserved insect specimens (permits, forms, carrier restrictions) and obtain any permits before you email CBG.
4. **Email info@globalmalaise.org** to say you are ready to ship. Include:
    - the number of bags you will send
    - the Excel log sheet
    - removal photos, if not already sent
    - any export or shipping requirements or restrictions for your country
    - whether you can cover the shipping cost (see note below)

> **NOTE** **Shipping costs:** we encourage participants to cover shipping if they can, to help offset project costs. If you can't, tell CBG in your email so fee recovery or collect shipping can be arranged.

> **NOTE** **First time running a trap?** Ship a test batch of 20–30 bags part-way through the season. CBG can check sample condition early, and you can confirm the export route works before sending the full collection.

> **NOTE** **Import into Canada:** Canada does not normally require import documents for dead, preserved insect specimens shipped for research. CBG will tell you if your shipment needs anything else.

11 PREPARE SAMPLES: REMOVE ETHANOL

Do this just before shipping, not earlier.

What you'll need

- ☐ Bagged samples (from freezer)
- ☐ Plastic pipettes
- ☐ Small piece of Nitex filter + tape
- ☐ Forceps
- ☐ Ethanol waste container
- ☐ Heat sealer

What you'll do

1. Tape a small piece of Nitex filter over the tip of a plastic pipette.
2. Open each bag and use the filtered pipette to remove most of the ethanol. If specimens stick to the tip, return them to the bag with forceps.
3. Leave **no more than 30 mL** of ethanol in each bag and keep the package total under 1 L (see table).
4. **Heat seal each bag** (next page).

Samples per package	Ethanol per bag	Why
Up to 33 bags	Up to 30 mL	33 × 30 mL ≈ 1 L package limit
34–52 bags (e.g. full year)	Remove as much as possible	52 × 30 mL = 1.56 L would exceed 1 L

CRITICAL IATA Special Provision A180: maximum **30 mL** free ethanol per bag and **1 L** flammable liquid per outer package. Shipments over these limits cannot travel as non-restricted scientific specimens.

12 HEAT SEALING

CBG provides one of two sealers depending on project size.

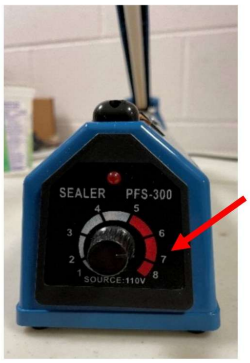
CRITICAL Never place either sealer on blankets, sofas, clothes, any flammable surface, near a burner or in an oven.

Yeler: After 30 minutes of continuous use, let it rest for 3 minutes. Do not clean the heating strip with a wet cloth.

Salton: Pressing the heat pad switches it on (fire hazard if pressed in storage). The built-in bag opener blade is very sharp.

A. Yeler Impulse Sealer PFS 300

1. Plug in the sealer and set the dial to **7**. Place the open end of the bag straight across the heating element, as close to the top of the bag as possible (so CBG can open and reseal it).





2. Press the lever down until the indicator light turns off. The seal is complete.





3. Raise the lever and continue with the next bag.

B. Salton smartsealer (battery)

1. Insert 2 AA batteries.
2. Place the open edge of the bag in the sealer, with no ethanol, insects or debris in the sealing path.
3. Hold the bag in one hand and the sealer in the other. Press and hold the press bar against the heat pad for 3 seconds to preheat (once per session).
4. Keeping light pressure on the press bar, slowly slide the sealer across the top edge of the bag. **Take about 10 seconds per bag**; moving faster can leave gaps in the seal.
5. Check that the seal is closed along the entire edge. Repeat for all bags.

13 PACK AND SHIP

What you'll need

- ☐ Heat-sealed sample bags
- ☐ Large outer plastic bag
- ☐ Absorbent material
- ☐ Box + cushioning
- ☐ Shipping stickers
- ☐ Customs Declaration Form (outside Canada)
- ☐ Packing tape

What you'll do

1. **Double bag.** Place the sealed bags in a second plastic bag with absorbent material (e.g. paper towels) and **heat seal** the outer bag. Tape can be added over the seal for extra security.
2. Place the bag in a sturdy box or plastic container with cushioning and seal it with tape.
3. Mark the box (or use the sticker provided): **"Scientific research specimens, not restricted, Special Provision A180 applies"**.
4. **Outside Canada:** on the customs declaration write "Insect Specimens for Scientific Study Only (dead), NON-HAZARDOUS, No Commercial Value" and declare a value of zero (or the lowest allowed). Complete the CBG Customs Declaration Form and attach it to the outside with the other shipping documents.
5. Address the package (or use the address sticker):

   Sample Submission – Malaise Trap Sampling
   Centre for Biodiversity Genomics, University of Guelph
   50 Stone Road East, Guelph, Ontario, CANADA N1G 2W1
   Phone: +1 (519) 824-4120 ext. 56393

6. Write your **name, return address, phone number, and tracking number** on the outside of the box, separate from the waybill, so the package can be traced if the waybill is lost.
7. **Ship by courier:** FedEx is preferred, using an international express or priority service. Tell CBG first if you need to use another carrier or postal service.
8. **Email the tracking number** to info@globalmalaise.org.

> **NOTE** Ship early in the week (Monday–Wednesday) and avoid public holidays, so samples are not held in transit over a weekend.

14 TROUBLESHOOTING

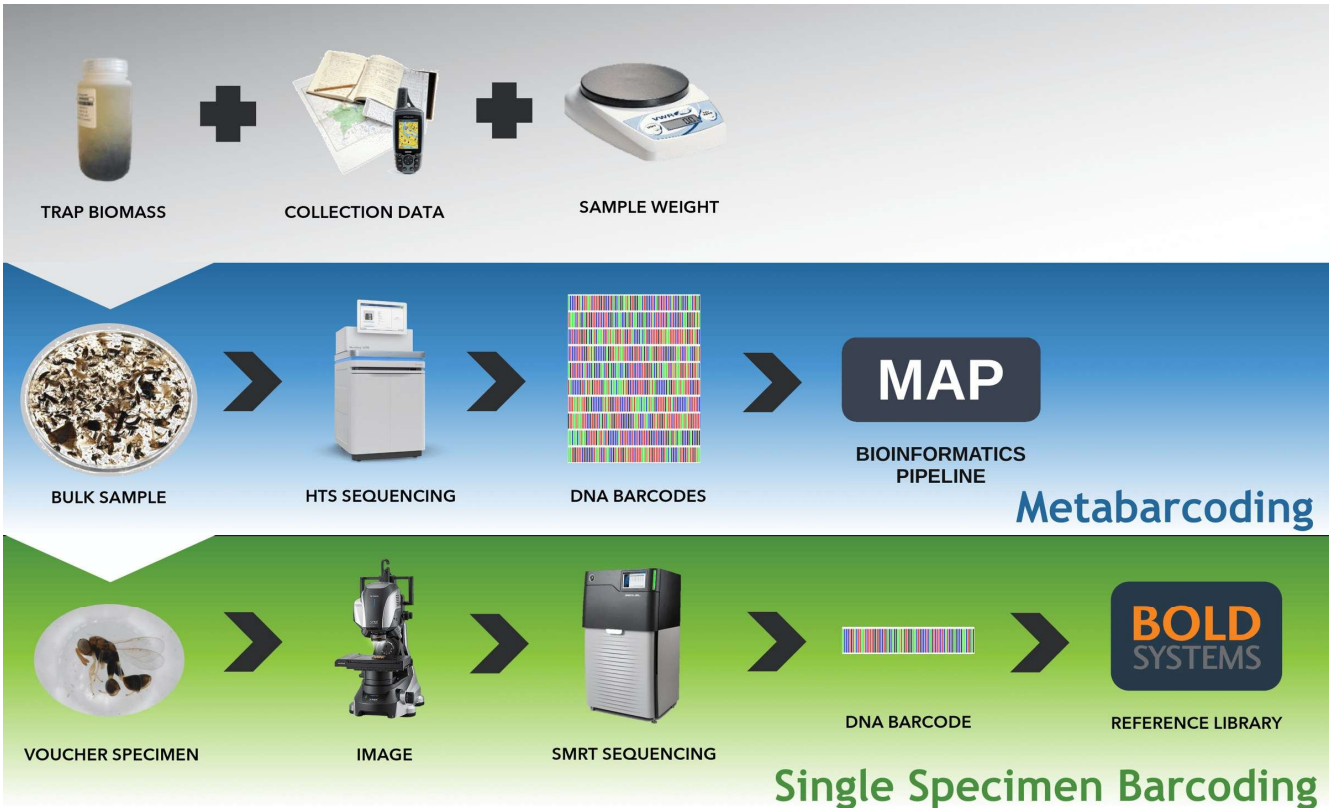
Trap, sample or shipping problems: info@globalmalaise.org

Problem	What to do
Trap down, damaged or blown over	Record the Trap Condition (Issue 1–5), repair if possible, and contact info@globalmalaise.org for parts.
Bottle dry, low or overflowing	Record the Bottle Condition and top up with 95% ethanol. Visit more often if bottles fill quickly or ethanol evaporates.
Missed a weekly visit	Collect on the next possible day, then go back to your usual day. Record the actual dates. Choose a collection day unlikely to fall on holidays and train a backup person.
Storm or high winds	Check the trap as soon as possible: repair, re-tension and top up ethanol.
Want to move the trap	Traps stay at one site for the whole season so changes over time can be compared. Contact info@globalmalaise.org before moving it.
Freezer not available	Contact info@globalmalaise.org before sampling to agree on an alternative.

Frequently asked questions
Site choice, permits, shipping, results and more.
globalmalaise.org/resources/faq

15 YOUR SAMPLES AND DATA

What happens after your samples reach Guelph.



Processing. Processing usually finishes about a year after all samples are received, depending on volume and funding; samples may be held frozen until then. Every processed sample is weighed (wet weight) prior to analysis. Results appear on BOLD for single specimen barcoding, while metabarcoding results are emailed. Check with CBG before using any data.

Sample Ownership. Material is held by CBG as a permanent loan unless otherwise specified; you can request its return or destruction (cost-recovery fee applies).

Data Release. Data is released after a 12-month embargo. Site coordinates follow the same rules.

Learn more

Data Release Policy biodiversitygenomics.net › Data Release Policy	**Material Transfer Policies** globalmalaise.org › BMTA	**BOLD Systems** portal.boldsystems.org	**Centre for Biodiversity Genomics** biodiversitygenomics.net

NOTE Questions about your samples or data: **info@globalmalaise.org**

16 SHIPMENT CHECKLIST

Check off each item on shipping day. Detailed steps: pages 14–17.

Records

- ☐ Log sheet complete: every bottle has GMP#, start and end dates, and conditions
- ☐ Export permits and country shipping rules checked
- ☐ CBG emailed: number of bags, Excel log sheet, removal photos, export requirements

Samples

- ☐ Each bag holds 30 mL ethanol or less; whole package 1 L or less
- ☐ Each bag heat sealed
- ☐ Each bag labelled: GMP sticker on the outside, matching internal label inside
- ☐ Bags double bagged with absorbent material; outer bag heat sealed
- ☐ Box cushioned and taped shut

Box and documents

- ☐ Box marked “Scientific research specimens, not restricted, Special Provision A180 applies”
- ☐ Outside Canada: customs declaration and CBG Customs Declaration Form attached
- ☐ Addressed to CBG
- ☐ Your name, return address, phone and tracking number written on the box
- ☐ Shipping Monday–Wednesday, not before a public holiday
- ☐ Tracking number emailed to info@globalmalaise.org