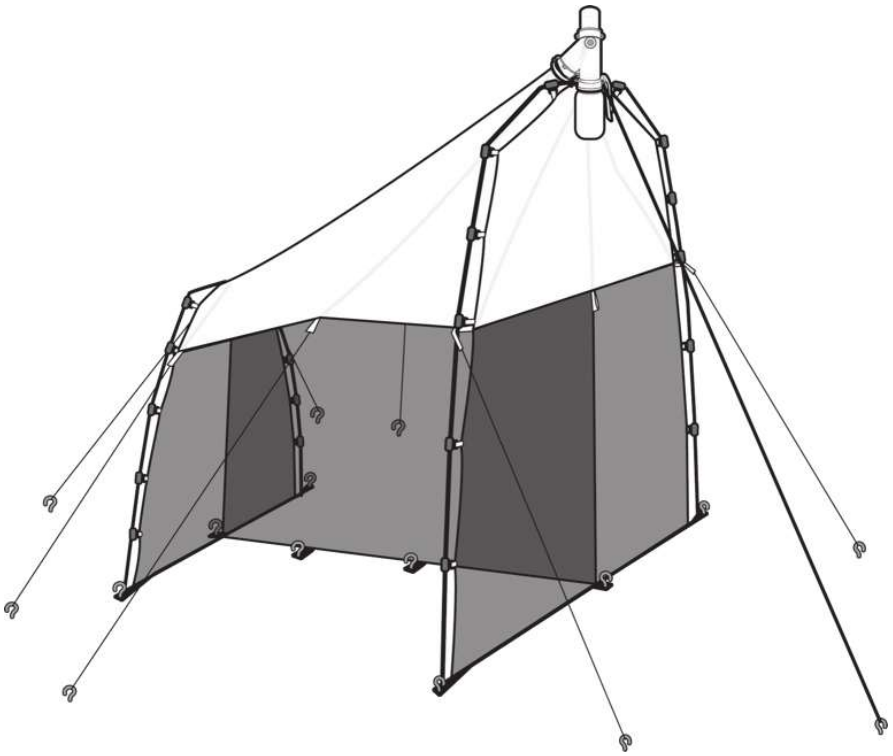
Centre for Biodiversity Genomics

Global Malaise Program

Malaise Trap Sampling

Standard Operating Procedures — 500 mL Bottles

With TrapTracker app (trial edition)



Record your Trap ID here for reference (from your TrapTracker label) **T _ _ _ _ _**	**Contacts** Trap, field and shipping questions: **info@globalmalaise.org** TrapTracker app support: **traptracker.support@globalmalaise.org**

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

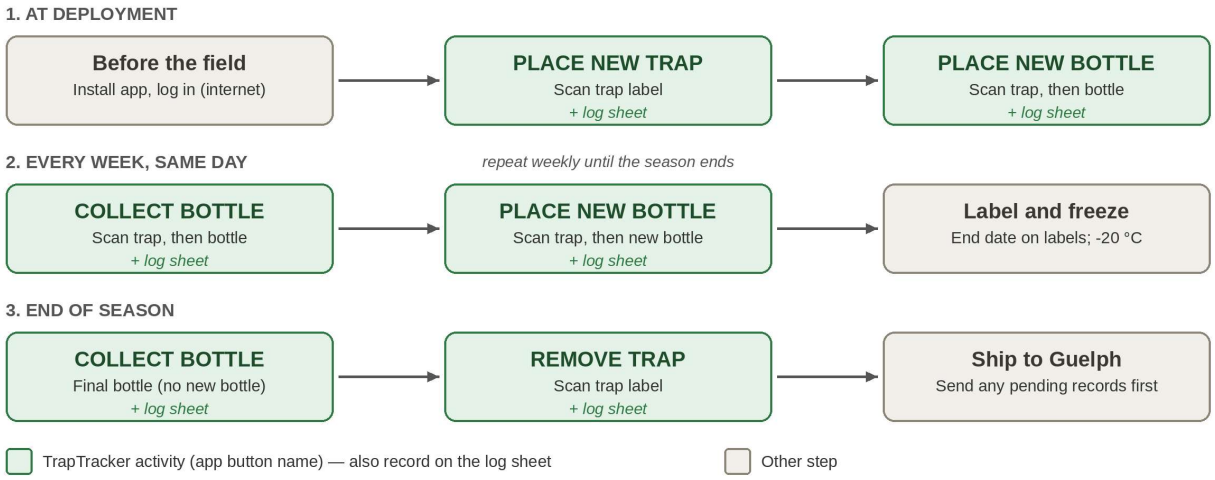
OVERVIEW

TRAPTRACKER TRIAL **Read this first.** TrapTracker is in a trial period. Record **every** activity in the app **and** on the paper Sample Log Sheet. The log sheet is the backup record. Look for the **LOG: app + sheet** tag on each step.

Can't use the Android app? Use the non-app version of this SOP or follow the same steps and record everything on the Sample Log Sheet only.

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	Install and log in to TrapTracker; prepare the first bottle	5
Trap assembly	Poles, trap head, stakes, guy lines; final check	6–8
Deployment	Place new trap, first bottle, place new bottle, site photos	9
Weekly collection	Collect bottle, place new bottle, trap checks	10
Labelling and storage	Dates on labels; -20 °C storage	11
End of season	Final bottle, remove trap, removal photos, send pending records	12
Before you ship	Check log sheet; export rules; notify CBG	13
Prepare samples	Remove ethanol; IATA limits	14
Pack and ship	Double bag, box, mark, customs, address	15
Troubleshooting	App, trap and sample problems; FAQ	16
Your samples and data	Processing, ownership, data release	17
Shipment checklist	Check-off summary for shipping day	18

TrapTracker 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 'TrapTracker' Trap ID QR label + zip ties
- ☐ **52 pre-labelled 500 mL collection bottles** (numbered lids; external + internal GMP label)
- ☐ 1 decanting lid (spare coupling ring)
- ☐ 2 Nitex filters
- ☐ Shipping stickers (A180 marking, address)

Supplied by you

- ☐ 95% ethanol (no substitutes)
- ☐ Ethanol waste container
- ☐ Ethanol squirt bottle
- ☐ Standard household freezer (-20 °C), preferred, or refrigerator
- ☐ Android phone, Android 13 or newer, with TrapTracker installed
- ☐ Pencil
- ☐ Two large plastic bags, absorbent material (e.g. paper towels) and a return shipping box
- ☐ 2 × 6–8 ft posts (optional, for windy sites)
- ☐ Mallet (optional)
- ☐ Foil (for sunnier sites)



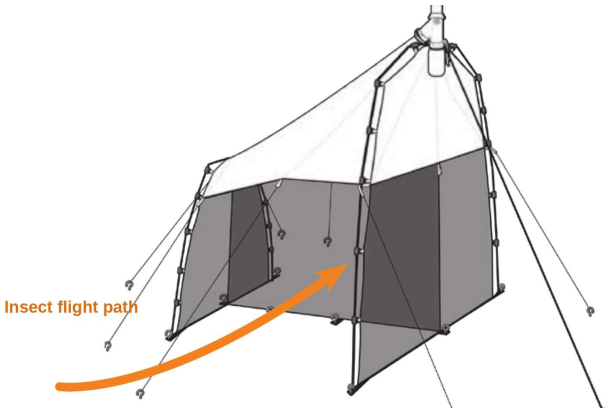


Malaise trap kit and pre-labelled 500 mL collection bottles.

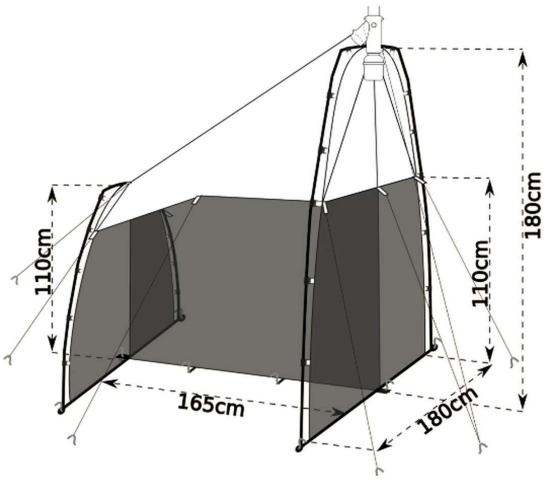
2 SITE SELECTION

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. 13).
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

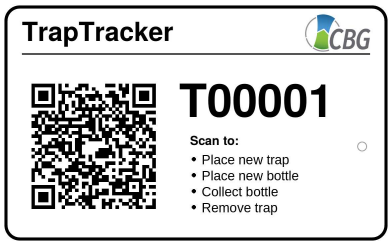
Do this at home or the office, while you have an internet connection.

What you'll need

- ☐ Android phone (Android 13 or newer)
- ☐ Internet connection
- ☐ Trap kit
- ☐ First pre-labelled collection bottle
- ☐ 95% ethanol
- ☐ Pencil

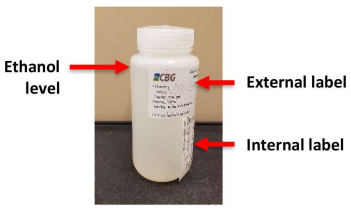
What you'll do

1. **Watch the trap deployment video** (QR code below, or youtube.com). It shows an older trap design, but most tips still apply.
2. **Install TrapTracker.** In the Google Play Store, search for "TrapTracker" and install it. The app and its User Guide are also on the TrapTracker web page (QR code below).
3. **Allow permissions.** When the app opens, allow **notifications** (maintenance and update alerts) and **location** (choose precise). Without location access, the app cannot record trap coordinates.
4. **Create an account.** Accept the Terms of Use, then enter a username, a valid email and a password of 10–15 characters with upper- and lowercase letters, a number and a special character.
5. **Log in and check the main menu.** You should see four buttons: **PLACE NEW TRAP**, **PLACE NEW BOTTLE**, **COLLECT BOTTLE**, and **REMOVE TRAP**.
6. **Prepare the first bottle.** Use the bottles in order of the numbers on their lids, starting with the lowest. Fill the bottle with 95% ethanol to the level shown. Do not substitute other alcohols or preservatives.
7. **Write the start date.** Using a **PENCIL**, write the start date on both the **external label** and the **internal label** (inside the bottle).



Your trap label

Scan the QR code in the app or type the Trap ID if it will not scan.



Pre-labelled bottle

CRITICAL Log in **before every field visit** while you have a connection. A login stays valid for up to about a week, so it can expire between weekly visits. Logging in needs internet; recording at the trap does not.

NOTE Records are saved on the phone and sync when connected. By default, the app syncs **on Wi-Fi only**. After each submission, check that the sync status shows **Complete** (green); "Enqueued" or "In Progress" means it is waiting for a connection.

NOTE Each pre-labelled bottle is used **once**: it holds that week's sample through storage and shipping. The app rejects a bottle code that has already been used.

Trap deployment video

TrapTracker web page

4 TRAP ASSEMBLY (1 OF 3)

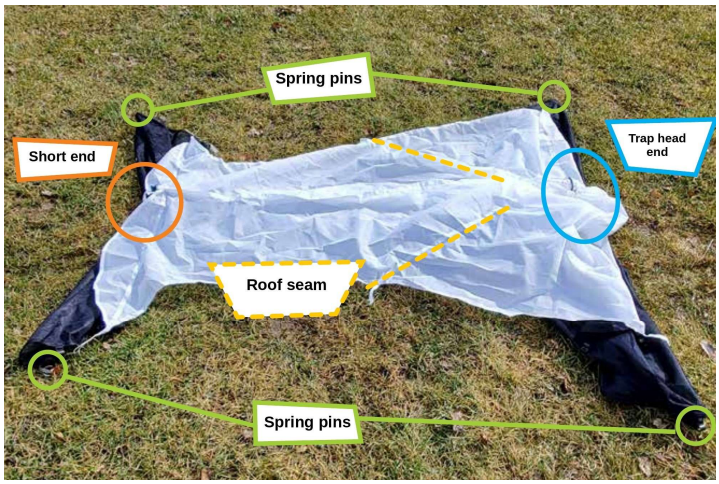
Ideally done by two people. Allow for about 30 minutes.

What you'll need

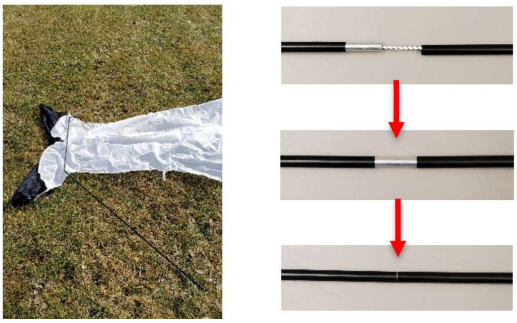
- ☐ Malaise trap kit (carrying bag)
- ☐ Mallet (optional)
- ☐ 2 × 6–8 ft posts (optional)
- ☐ Zip ties or rope (optional)

What you'll do

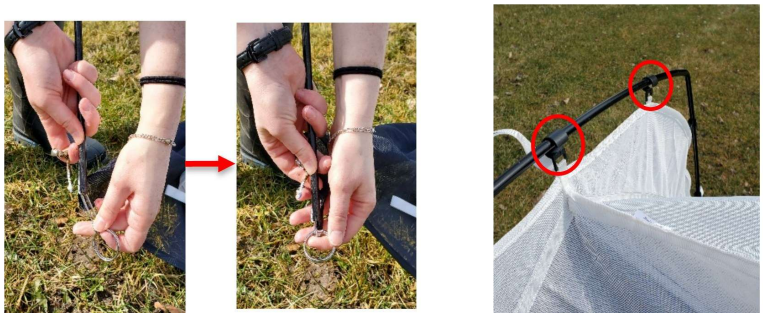
1. Bring the carrying bag with all components to the site.
2. Unfold the trap body and lay it flat on the ground, **white side up**.



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



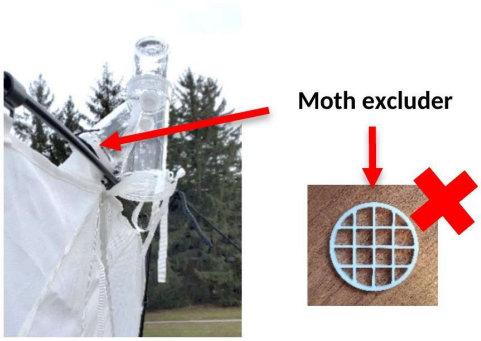
4. Push the **spring pins** at the front corners of the trap into the ends of the **long pole**. Clip the hooks sewn onto the trap around the pole to form a mesh panel. Repeat at the back with the **short pole**.



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.





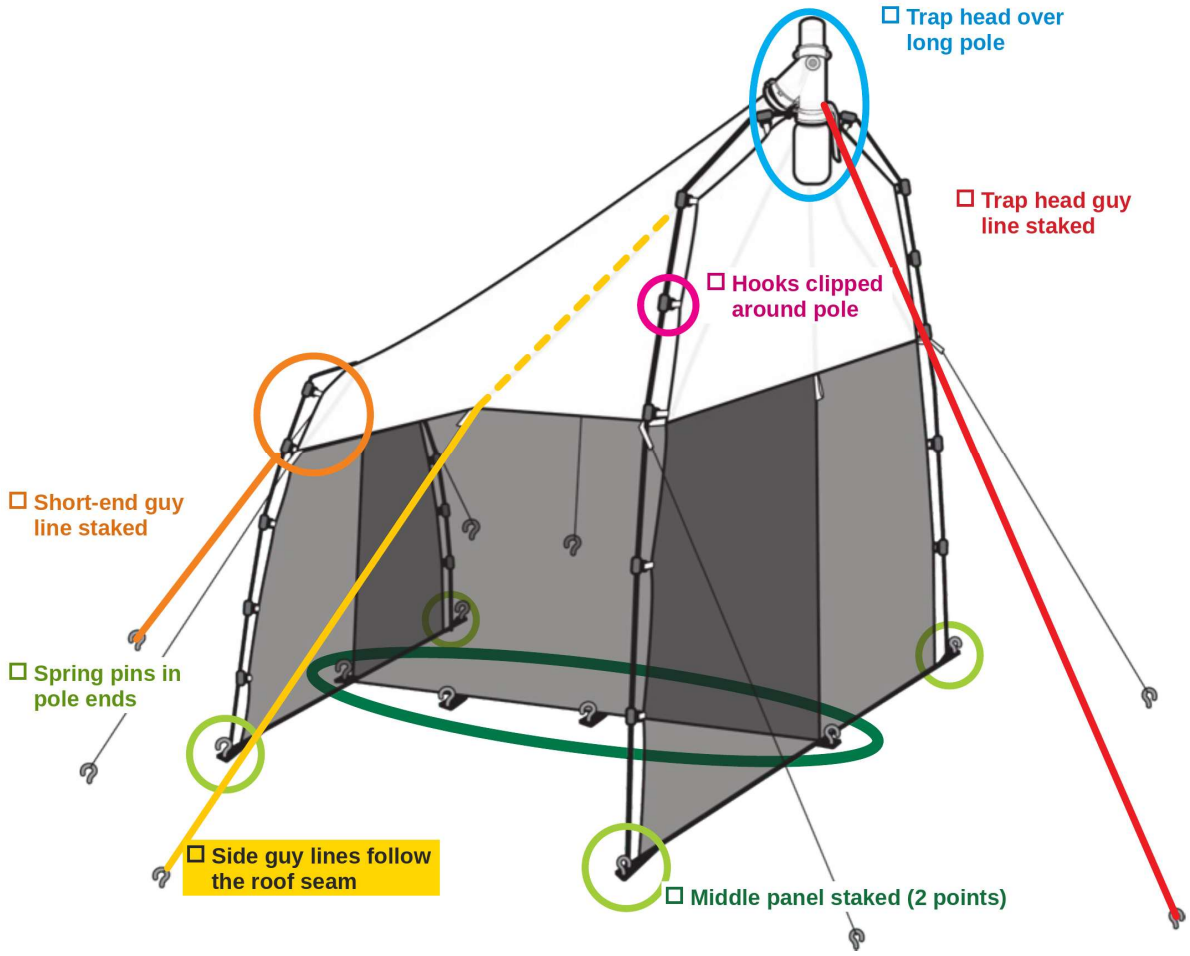
5. Attach and stake the remaining guy lines (8 in total, including the two above), so the trap holds its shape under tension. On the sides, follow the **seam line on the white roof**; this funnels insects up to the trap head. Front and back lines can be tied to trees instead.





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

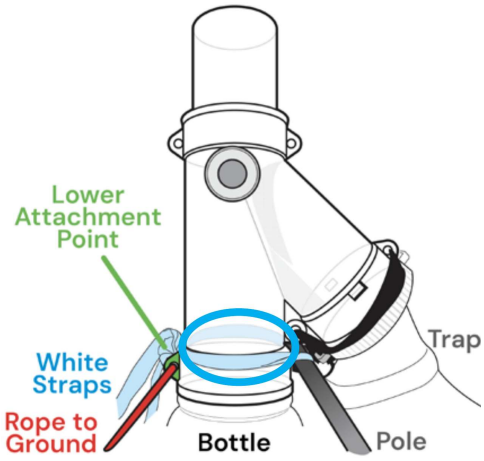
Complete the app steps standing at the trap: PLACE NEW TRAP records the coordinates of where you are.

What you'll need

- ☐ Assembled trap
- ☐ TrapTracker QR label + zip ties
- ☐ Labelled bottle with 95% ethanol
- ☐ Phone, logged in to TrapTracker
- ☐ Sample Log Sheet + pencil
- ☐ Foil (sunny sites)

What you'll do

1. **Attach the trap label** to the front (tall) pole, close to the trap head, using the zip ties. QR code facing out.
2. In TrapTracker, tap **PLACE NEW TRAP** and scan the trap label. If it does not scan within about 10 seconds, type the code (e.g. T00001). Enter the deployment date and any notes, check the review screen shows latitude, longitude and elevation, then **Submit**. LOG: app + sheet
3. **Log sheet:** fill in the header: Trap ID, deployment date, site details and the coordinates shown in the app.
4. **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.







5. Tap **PLACE NEW BOTTLE**, scan the trap label, then scan the **GMP label on the bottle**. Enter the deployment date and Submit. On the log sheet, start the Week 1 row: GMP# and start date, check off “app”. LOG: app + sheet
6. **Check sync.** Sync status should read “Complete”. If it is waiting for Wi-Fi, confirm it later the same day.
7. **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

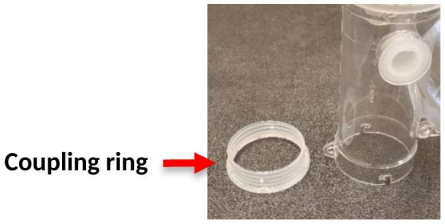
Collect on the same day every week. Each visit = one COLLECT BOTTLE + one PLACE NEW BOTTLE.

What you'll need

- ☐ Next pre-labelled bottle (95% ethanol, start date written)
- ☐ Lid for the collected bottle
- ☐ Phone, logged in to TrapTracker
- ☐ 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. Tap **COLLECT BOTTLE**. Scan the trap label and choose the **Trap Condition**. Scan the GMP label on the full bottle, enter the collection date and choose the **Bottle Condition**. Add notes if needed, then Submit. LOG: app + sheet
3. **Log sheet:** on that week's row, enter the end date, trap and bottle conditions and notes; check off "app".
4. Screw on the next bottle and tie it with the white straps. Tap **PLACE NEW BOTTLE**, scan the trap label, then the new bottle's GMP label, and Submit. Start the next row on the log sheet. LOG: app + sheet
5. **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**.
6. Take the full bottle back, add the end date to its labels and put it in the freezer the same day (p. 11).

Trap Condition (app dropdown)	Bottle Condition (app dropdown)
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 same condition as in the app using its short code: **OK** or the issue number (e.g. **3**). Describe any "Other" or issue in the notes.

7 LABELLING AND STORAGE

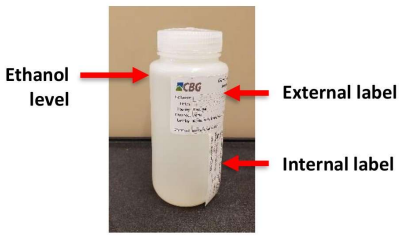
Each collected bottle is the sample. Complete its labels and freeze it the same day.

What you'll need

- ☐ Collected bottle (capped)
- ☐ Pencil
- ☐ Squirt bottle of 95% ethanol
- ☐ Freezer (-20 °C)

What you'll do

1. **Check the cap.** Make sure the cap is screwed on tightly and the bottle is not leaking.
2. Using **PENCIL**, write the end date and any notes (e.g. trap down, bottle dry) on both the **external label** and the **internal label**. The start date was written when the bottle was prepared.



3. **Do not remove any specimens** from the bottle (this keeps samples comparable across sites).
4. Store bottles **upright** in a **standard household freezer at -20 °C**. In a freezer, minimal ethanol is needed.
5. **No freezer?** Store bottles in a refrigerator or a cool, dark place, and add fresh 95% ethanol as needed so the whole insect mass stays **fully submerged**.

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.

8 END OF SEASON

Do the last collection and REMOVE TRAP on the same visit, at the trap.

What you'll need

- ☐ Phone, logged in to TrapTracker
- ☐ Sample Log Sheet + pencil
- ☐ Bottle lid
- ☐ Trap carrying bag

What you'll do

1. Collect the final bottle with **COLLECT BOTTLE** as usual. **Do not** place a new bottle. LOG: app + 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. Tap **REMOVE TRAP**, scan the trap label, enter the removal date and notes, and Submit. Write the removal date in the log sheet header. LOG: app + 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.
5. **Send any pending records.** Open TrapTracker while connected to Wi-Fi so any records still waiting are sent. If a submission failed, email traptracker.support@globalmalaise.org; the log sheet is the record in the meantime.

9 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, and every row is checked off "app".
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 bottles 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 bottles 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.

10 PREPARE SAMPLES: REMOVE ETHANOL

Do this just before shipping, not earlier.

What you'll need

- ☐ Bottled samples (from freezer)
- ☐ Decanting lid + Nitex filter
- ☐ Ethanol waste container
- ☐ Squirt bottle of 95% ethanol

What you'll do

1. Fit the decanting lid with a Nitex filter onto the bottle. Pour off the ethanol into the waste container, keeping the specimens in the bottle. Scan the QR code for a short video.



Decanting video

2. Leave **no more than 30 mL** of ethanol in each bottle and keep the package total under 1 L (see table). Rinse any specimens on the filter back into the bottle with a little ethanol.
3. Screw the original cap back on tightly. Rinse the filter thoroughly before the next bottle.

Samples per package	Ethanol per bottle	Why
Up to 33 bottles	Up to 30 mL	33 × 30 mL ≈ 1 L package limit
34–52 bottles (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 container and **1 L** flammable liquid per outer package. Shipments over these limits cannot travel as non-restricted scientific specimens.

11 PACK AND SHIP

What you'll need

- ☐ Capped sample bottles
- ☐ Two large plastic bags
- ☐ Absorbent material
- ☐ Box + cushioning
- ☐ Shipping stickers
- ☐ Customs Declaration Form (outside Canada)
- ☐ Packing tape

What you'll do

1. **Double bag.** Place the capped bottles in a plastic bag and seal it. Place that bag in a second plastic bag with absorbent material (e.g. paper towels) between the two bags. Seal both bags tightly, with a heat sealer if you have one, or by taping generously.
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.

12 TROUBLESHOOTING

App problems: traptracker.support@globalmalaise.org · Trap, sample or shipping problems: info@globalmalaise.org

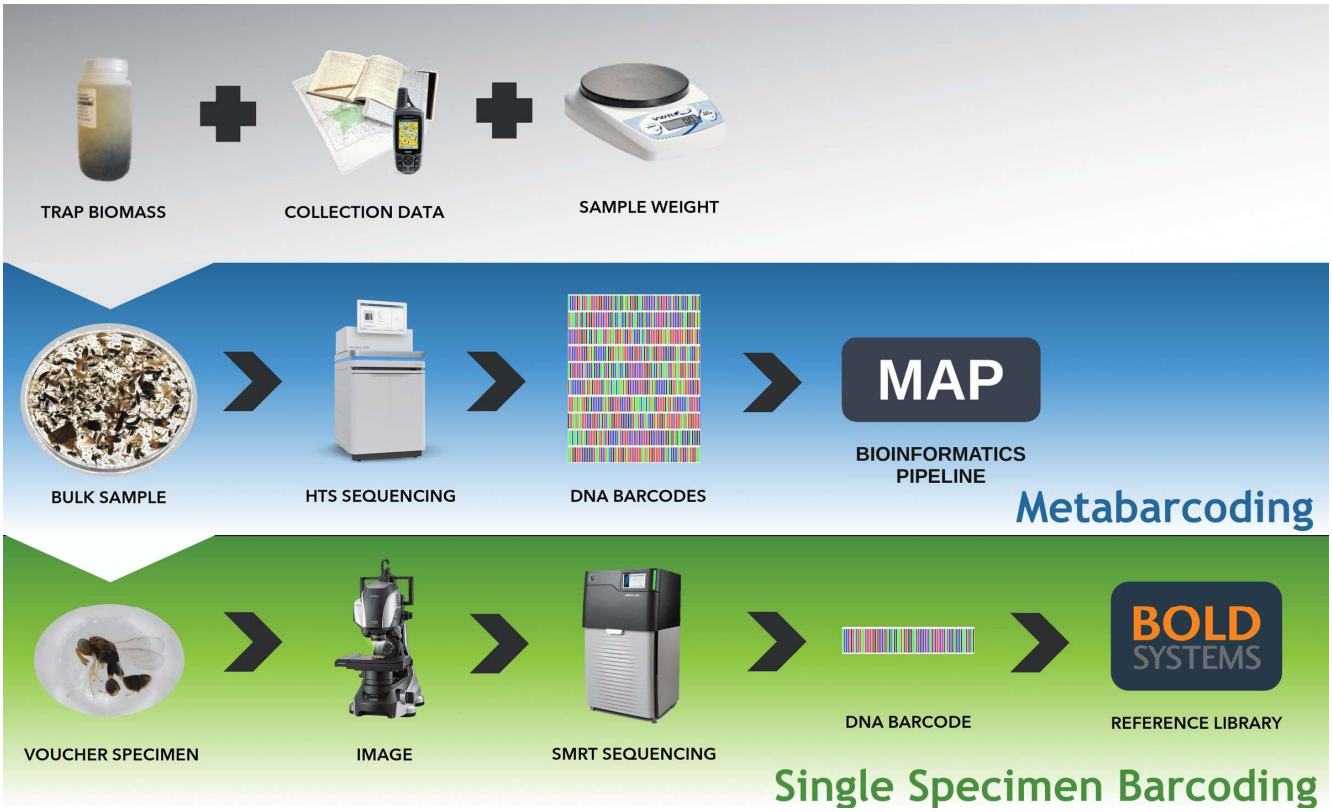
Problem	What to do
QR code will not scan	Wait about 10 seconds for the manual entry option and type the code printed on the label (e.g. T00001 or the GMP#).
"Code does not exist" when placing a bottle	The trap must be placed first. Check PLACE NEW TRAP was submitted for this Trap ID.
Bottle code rejected as already used	Each pre-labelled bottle can be used only once. Check you took the next bottle in lid-number order.
Sync shows Enqueued / In Progress	The record is saved on the phone and waiting for a connection (Wi-Fi by default). Check again once connected.
Sync shows Failed	The app shows only a general error. Keep the log sheet entry, note the date, time and activity that failed, and email traptracker.support@globalmalaise.org.
Logged out at the trap with no signal	Record everything on the log sheet. Enter it in the app once you can log in, using the actual dates, and add a note that it was entered late.
Invalid credentials	The app shows how many login attempts are left. After 5 failed attempts, login is paused for 5 minutes (the login button shows a countdown); further failed attempts lengthen the pause. Use Forgot Password rather than guessing. Repeated failures can block login from that phone; if so, email traptracker.support@globalmalaise.org.
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	Store bottles in a refrigerator or cool, dark place with the insects fully submerged in ethanol, and contact info@globalmalaise.org before sampling.

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

TrapTracker User Guide
Account, password and sync details.
globalmalaise.org/resources/traptracker

13 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. Trap coordinates from TrapTracker 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**

14 SHIPMENT CHECKLIST

Check off each item on shipping day. Detailed steps: pages 13–15.

Records

- ☐ Log sheet complete: every bottle has GMP#, start and end dates, and conditions
- ☐ TrapTracker opened on Wi-Fi so any pending records are sent
- ☐ Export permits and country shipping rules checked
- ☐ CBG emailed: number of bottles, Excel log sheet, removal photos, export requirements

Samples

- ☐ Each bottle holds 30 mL ethanol or less; whole package 1 L or less
- ☐ Each bottle capped tightly; start and end dates on both labels
- ☐ Bottles double bagged with absorbent material; both bags 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