

## BOSQUE ECOSYSTEM MONITORING PROGRAM

# Pitfall Monitoring Directions

### Pitfall Monitoring Background

The 20 pitfall traps at each site are used to measure surface active arthropod activity, which provides information about habitat conditions. The presence, absence, abundance and diversity of particular arthropods provide supporting documentation on the ecological condition of each site.

### Pitfall Monitoring Materials

#### Day one supplies

- pitfall data sheet, clipboard and pen
- one trowel per person
- several holey cups
- several solid cups
- map of site
- extra wood lids
- Sharpie

#### Day two supplies

- 20 plastic sandwich Ziplock bags labeled with site name, collection date and numbers 1 – 20 per site
- Sharpie
- one gallon Ziplock bag labeled with site name and collection date
- cooler and frozen blue ice
- pitfall data sheet, clipboard and pen
- plastic lids for cups
- trowel

### Pitfall Monitoring Directions

Pitfall trap monitoring is a two-day task. Traps are opened on one day and collected 48 hours later.

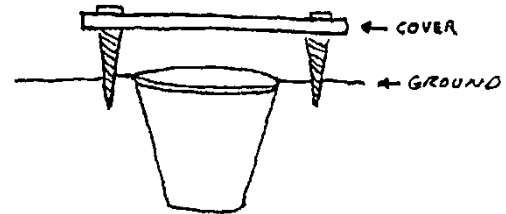
#### Day one

Record site name, date of setting, name of setters and time of setting on data sheet. Locate traps using site map. Lift wooden lid away from yourself (see image).



If cups are in good condition and dirt is close to edges of

lid already, leave plastic lid on and build up dirt right to the edge of the cups. Remove plastic lid, pat dirt right up to the edge of the cup and place wooden lid on surface of ground (see image).



If cups are not in good condition (have cracks, are bent, etc.), replace one or both cups. If needed, clean out the top cup. Scatter any contents and debris. Leaving the bottom cup in place remove any dirt that might have fallen into it. Replace the top cup into the bottom cup.

Confirm that cup is level. The rim of the top cup should be level with the ground surface. If it is not level, take out both cups, re-dig the hole and replace the cups so that they are at the right level.

Place plastic lid on cups and build up dirt right to the edge of cups. Remove plastic lid, pat dirt right up to the edge of the cup and place wooden lid on surface of ground (see image above).

The wood lid, designed to reduce predation and limit rainfall, should be about 1.5 inches above the cup rim. Once set, you should easily be able to slide two fingers between the cup and the cover.

Read rain gauges and record current rain amounts on data sheet. Do not empty gauges!

#### Day two (48 hours later)

Record site name, date of collection, name of collectors and time of collecting on data sheet. Open trap by opening it away from yourself. Pull the top cup out, leaving the bottom cup in place to hold the hole.

Empty the entire contents of each trap (bugs, leaves, dirt, etc.) into a Ziplock bag marked with that particular trap number, site and date. Be careful to put the correct

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## Surface Active Arthropod Trapping

Bosque Ecosystem Monitoring Program – Science, Education & Stewardship

BEMP site name: \_\_\_\_\_



Traps Opened By (your name): \_\_\_\_\_

Date Traps Opened: \_\_\_\_\_ Time: \_\_\_\_\_




Traps Collected By (your name): \_\_\_\_\_


Date Traps Collected: \_\_\_\_\_ Time: \_\_\_\_\_

### Rain Gauge Readings - Do Not EMPTY!!!



1. level when traps collected: \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)
2. level when traps opened: \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)
3. **Total Rainfall** \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)
4. level when traps collected: \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)
5. level when traps opened: \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)
6. **Total Rainfall** \_\_\_\_\_ (mm) \_\_\_\_\_ (inches)

| Trap | Opened | Comments | Trap | Closed | Comments  |
|------|--------|----------|------|--------|--|
| B1   |        |          | B1   |        |  |
| B2   |        |          | B2   |        |  |
| B3   |        |          | B3   |        |  |
| B4   |        |          | B4   |        |  |
| D5   |        |          | D5   |        |  |
| D6   |        |          | D6   |        |  |
| D7   |        |          | D7   |        |  |
| D8   |        |          | D8   |        |  |
| F9   |        |          | F9   |        |  |
| F10  |        |          | F10  |        |  |
| F11  |        |          | F11  |        |  |
| F12  |        |          | F12  |        |  |
| H13  |        |          | H13  |        |  |
| H14  |        |          | H14  |        |  |
| H15  |        |          | H15  |        |  |
| H16  |        |          | H16  |        |  |
| J17  |        |          | J17  |        |  |
| J18  |        |          | J18  |        |  |
| J19  |        |          | J19  |        |  |
| J20  |        |          | J20  |        |  |

\*\* When you open pitfall traps, make sure the cups are level with the ground! 

\*\* When traps are collected, place all invertebrates from each cup in it's own labeled bag!

Data Entry ~ file: \_\_\_\_\_  
entry by: \_\_\_\_\_ date: \_\_\_\_\_

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trap contents into each bag. Record anything necessary (if the trap was disturbed or not set well) on the data sheet and Ziplock bag. If you find an empty trap, still empty the contents into the Ziplock, as there may be microscopic arthropods in the cup.

If vertebrate species have been caught, record animal on data sheet and Ziplock bag with a Sharpie and release it.

If you can positively identify any large arthropods (*Eleodes suturalis*, *Calosoma scrutator*, *Pasimachus* sp., wolf spider, large centipede, child of the earth, etc.), release them and note the identification and quantity on the data sheet and Ziplock bag with a Sharpie.

Put plastic lid securely onto solid cup and place into bottom, holey cup. Place wood lid on top of the cups and press it down so that it is flush with the soil. To reduce the potential for disturbance, the wooden lid can be covered with leaves and dirt.

Place all of the sandwich bags in a larger Ziplock bag and put into a cooler with frozen blue ice. When back from the field, put bugs into a freezer and leave them there for at least a month before identifying them.

### Pitfall Lab Materials

- forceps
- plastic weigh boats or trays
- arthropod identification pages
- pitfall lab data sheet
- magnifying glasses

### Pitfall Lab Directions

Write the site name and collection date on Ziplock bags

and your name on the data sheet.

Take a Ziplock bag and write the trap number of that bag on the data sheet. Remove any plant material or large chunks of wood but be careful that no arthropods are attached to them! Place these into one plastic weigh boat.

Identify arthropods in this trap as best as possible using the arthropod identification sheets that follow. Write the trap number (i.e. 1), followed by the identification of one type of arthropod (i.e. spider or Araneae), followed by the quantity (i.e. 3). For another type of arthropod in this bag, again, write the trap number (1), followed by the identification (i.e. pill bug), followed by the quantity (i.e. 205). Continue this until you have identified all the arthropods in this trap.

SAVE ALL ARTHROPODS except for pill bugs and sow bugs. Be sure you identify which isopod you have – pill bug vs. sow bug! Once the person leading the lab has seen that you know the difference between these two, you can throw your isopods into the trash *once you have written down your quantity*.

Once you have identified everything in this trap, put all the non-isopod arthropods **and fine dirt** back into the Ziplock bag from which they came and start another bag. BEMP staff will look through the fine dirt through a microscope to identify microscopic arthropods such as mites and springtails.

When you are done with the lab, place all small Ziplock bags into the large bag from which they came and insert your data sheet into this bag.



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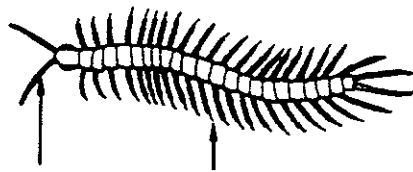
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To begin, separate the animals by counting the number of legs that they have:

1a. If it has more than 14 walking legs (7 pairs) ..... 2

2a. Body with many segments (parts), flattened, one pair of legs per segment. The jaws contain venom ..... CHILOPODA (centipedes)  
CODE: 2000000



2b. Body with many segments (parts), rounded, two pair of legs per segment. The mouth is small ..... DIPLOPODA (millipedes)  
CODE: 3000000



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1b. If it has 14 or fewer walking legs ..... 3

3a. With 14 legs, body with many segments (parts), color gray, sometimes with white speckles. Included here are two kinds, one that can roll up and one that cannot ..... ISOPODA (pill bugs, sow bugs, woodlice)  
 CODE: 6020000

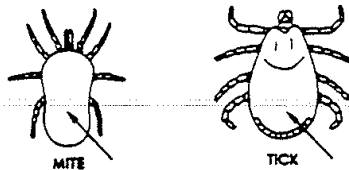


3b. Fewer than 14 legs ..... 4

4a. If it has walking 8 legs (4 pairs) ..... 5

5a. Body all one piece ..... 6

6a. Body size small (often less than 1 mm) ..... ACARI (mites, ticks)  
 CODE: 5020000

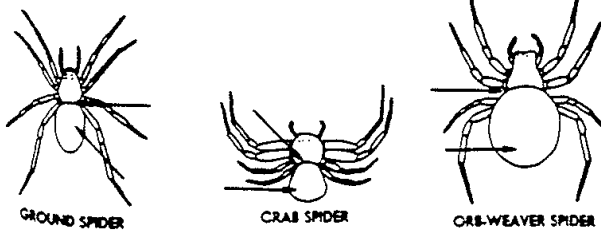


6b. Body size larger, two simple eyes on top of head. Legs often very long ..... OPILIONES (harvestmen, daddy long-legs)  
 CODE: 5040000



5b. Body with at least two pieces ..... 7

7a. Abdomen with spinnerets at the posterior (back) end of ventral (belly) side ..... ARANEAE (spiders)  
 CODE: 5010000

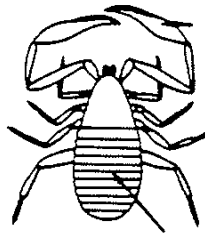


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**Pitfall Monitoring Directions**

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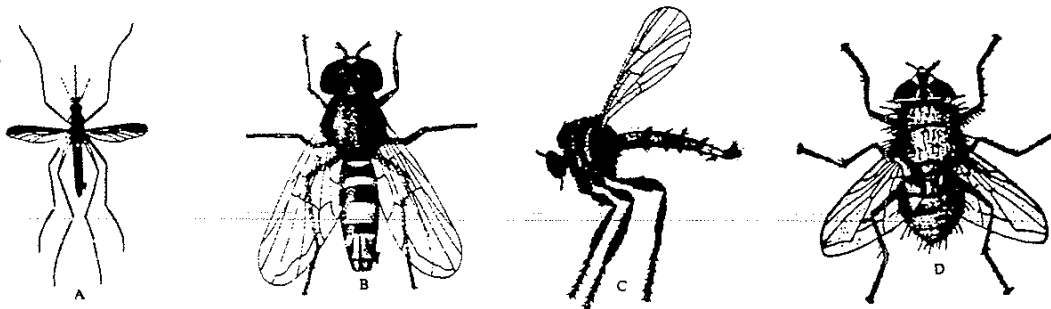
7b. Abdomen without spinnerets and without tail. Body length small (usually less than 2 mm). Front palps (feelers) like pincers . . . . PSEUDOSCORPIONES (pseudoscorpions)  
CODE: 5030000



4b. If it has 6 walking legs (3 pairs) . . . . . 8

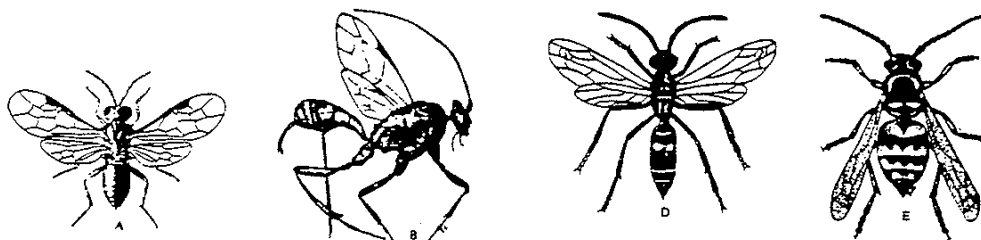
8a. With obvious wings . . . . . 9

9a. With only one pair of wing. . . . . DIPTERA (flies)  
CODE: 1060000



9b. With two pairs of wings . . . . . 10

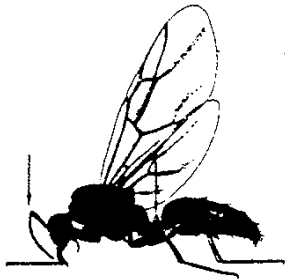
10a. Wings do not have scales or hairs and have few veins (lines). Most have skinny waist. Stinger may or may not be present . . . . . HYMENOPTERA (in part: wasps, bees)  
CODE: 1110000



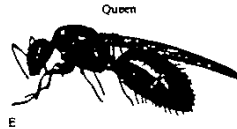
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10b. Look like wasps but usually with no stinger. Skinny waist.  
Antennae bent like elbows. Black, brown, red or yellow. ....  
..... HYMENOPTERA (in part: ants)  
CODE: 1111300



10c. Similar to ants but covered with hairs, fuzzy. Often colorful. Only males have wings ..... HYMENOPTERA (in part: velvet ants)  
CODE: 1111900

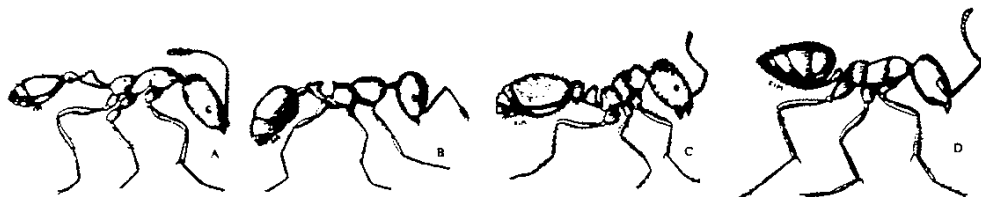


10d. Other insects with wings usually do not fall into pitfall traps. These include mayflies, antlions, lacewings, dragonflies, damselflies, caddisflies, butterflies and moths. We do not count these, but save them in the bag.

8b. No wings, or front wings thick and cover thinner back wings ..... 11

11a. No wings ..... 12

12a. Look like wasps, very skinny waist, no wings. Antennae bent like elbows. Black, brown, red or yellow. ....  
..... HYMENOPTERA (in part: ants)  
CODE: 1111300





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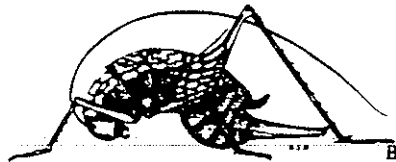
**Pitfall Monitoring Directions**

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12b. Similar to ants but covered with hairs, fuzzy. Often colorful.  
 Females lack wings and can sting. ....  
 .... HYMENOPTERA (in part: velvet ants)  
 CODE: 1111900

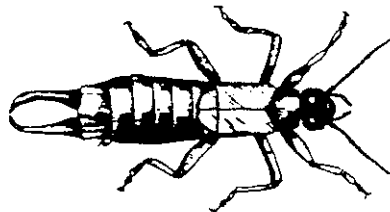


12c. Long, curved antennae, long back legs. Arched back. ....  
 .... ORTHOPTERA (in part: camel crickets)  
 CODE: 1190800



11b. Wings modified, front wings hard or leathery and covering back wings . . . 13

13a Back wings folded under very short, hard front wings (wing covers).  
 Abdomen has pincers on end ..... DERMAPTERA (earwigs)  
 CODE: 1010000

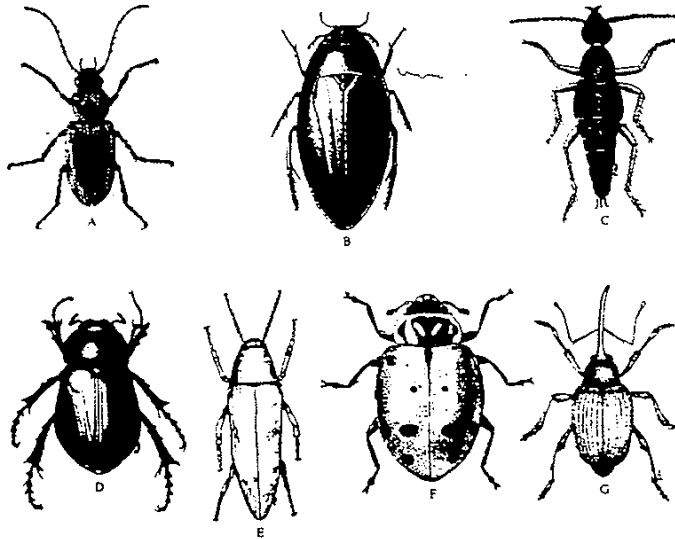


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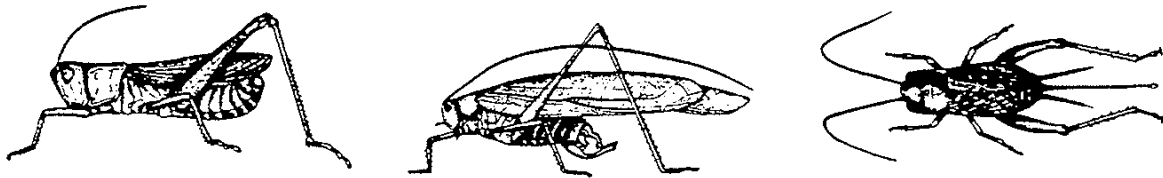
**Pitfall Monitoring Directions**

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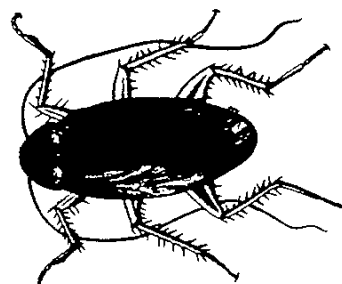
13b. Back wings folded under hard front wings (wing covers) which usually reach the end of the abdomen. No pincers .....  
 ..... COLEOPTERA (beetles)  
 CODE: 1020000



13c. Back wings held lengthwise along back under leathery front wings. Back legs are large for jumping .....  
 ..... ORTHOPTERA (in part: grasshoppers, crickets)  
 CODE: 1190000



13d. Back wings held lengthwise along back under leathery front wings. All legs are slender (thin). Body is broad, flattened .....  
 ..... BLATTODEA (cockroaches)  
 CODE: 1170000



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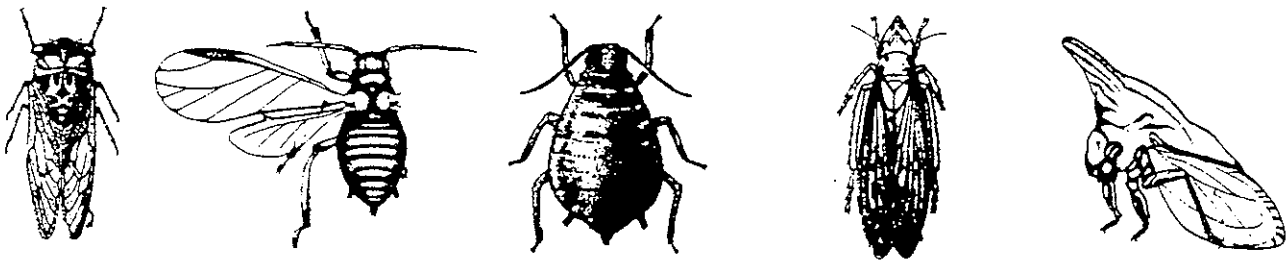
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13e. The front wings are clear and thin, or slightly thickened. Both pairs of wings are held along the back, or may be held above the body like a tent or roof. Long mouth like a straw that sticks down between the front legs

..... HOMOPTERA (leaf hoppers, cicadas, aphids)

CODE: 1150000



13f. Front wings are thick near the back but very thin near the end, like a membrane. The front wings overlap near the end. Long mouth like a straw that sticks down between the front legs

..... HEMIPTERA (true bugs)

CODE: 1750000

