Ecological Monitoring System Australia

Densitometer mount and staff assembly instructions

Overview of EMSA modules a densitometer is used for

Cover Module

A densitometer, mounted on a pole is used to conduct point intercept sampling. A quick simple view of the immediate canopy cover above can be determined by mounting the densitometer on a pole. Mounting a laser mounted below and in line with the densitometer, pinpoints the location of a point intercept downward reduces observer bias when sampling the lower vegetation and substrate.

Fire Severity Module

A densitometer and laser mounted on a staff are used to conduct point intercept sampling to survey signs of fire visible on the vegetation and the substrate using the same method as outlined for the Cover Module.

Time requirement

With all the required equipment and materials, it is estimated that it may take one personnel half an hour to construct a densitometer mount and staff.

Equipment

Materials for Densitometer mount

Table 1. List and approximate cost of materials for assembling a densitometer mount.

	Item	Quantity	Approximate cost per item ($)	Total ($)
	PVC Tee Socket (size will be determined by densitometer diameter in step 1)	1	9.00	9.00
	PVC Faucet Tee - Socket x Socket x Female BSP (size will be determined by PVC tee socket diameter in step 3)	1	5.50	5.50
	50-70mm Hose clamps	2	4.00	8.00
	GRS Densitometer	1	220.00	220.00
	25-20mm reducing bush	1	5.50	5.50
	1.1-2m Extension pole	1	22.00	22.00
	Laser pointer	1	7.00	7.00
	Total Cost			**277.00**

Consumables

- Liquid nails adhesive
- Nail polish
- Permanent marker

Tools for assembly

- 60 mm hole saw
- Hacksaw
- File
- Tape measure

Instructions and procedures

Constructing the Densitometer mount

1 Measure the diameter of the lens of the densitometer including the outside rim (see Figure 1). The diameter of the densitometer lens will determine the size of the PVC tee socket and PVC faucet tee required for the mount.

2 Select a PVC tee socket that is slightly larger than the densitometer diameter, aim for a snug fit.

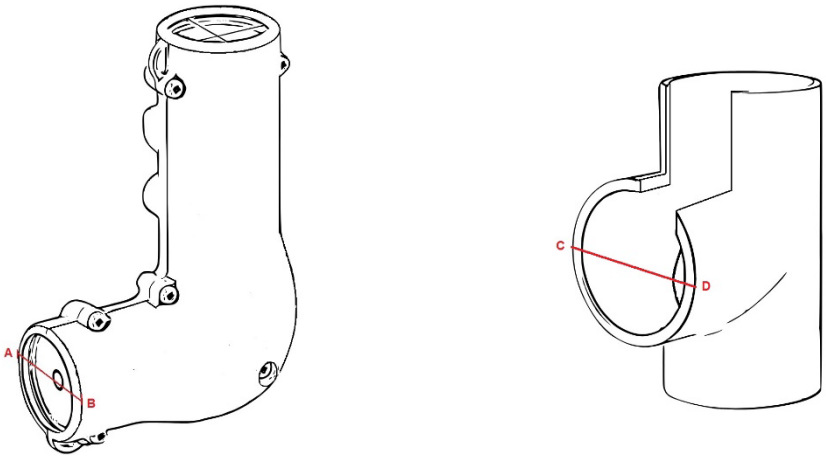

Figure 1. The point at which to measure diameter for the densitometer (left) and PVC tee socket (right) is indicated by the red lines.

3 Measure the diameter of the PVC tee socket, including the outside rim (see Figure 1).

4 Select a PVC faucet tee slightly larger than the diameter of the PVC tee socket. Again, aim for a snug fit.

5 On the PVC tee socket, use a permanent marker to mark two parallel lines between the top opening and the centre opening the width of the densitometer apart (see Figure 2).

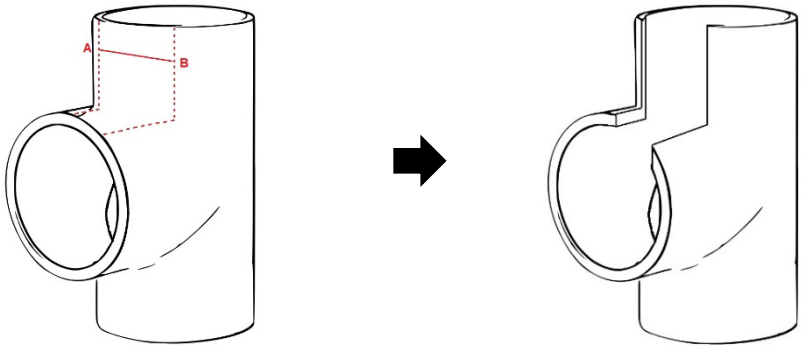

Figure 2. The parallel red dotted lines indicate where to cut to create a mount holding for the densitometer. The width of the parallel lines is determined by the diameter of the densitometer.

6 Using the hacksaw, make two straight cuts on the PVC tee socket along the measured marks.

7 On the PVC Faucet Tee, on the opposite side of the thread, using a permanent marker, mark a circle with a diameter matching the width of the PVC tee socket. Mark two parallel lines from the edge of the circle to the end of the PVC tee socket cylinder (see Figure 3)

8 Using the hole saw and hack saw, cut out the hole in the centre of the opening of the cylinder.

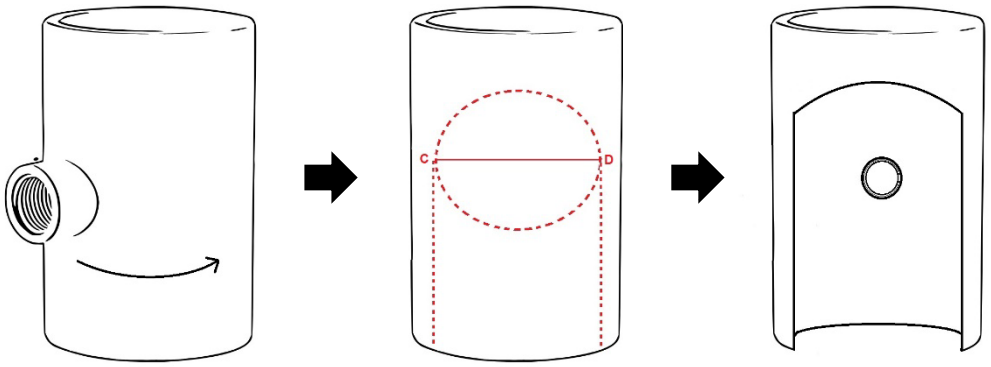

Figure 3. The red dotted lines indicate where on the PVC Faucet tee to cut to create the mount for the densitometer. The diameter of the circle and width of the parallel lines is determined by the diameter of the PVC tee socket.

9 Check that the PVC tee socket fits snuggly inside the PVC faucet tee and that the densitometer fits inside the PVC tee socket (see Figure 4) Some filing may be required.

10 Once everything fits, tighten one hose clamp around the front of the faucet tee and one around the neck of the faucet tee (Figure 5).

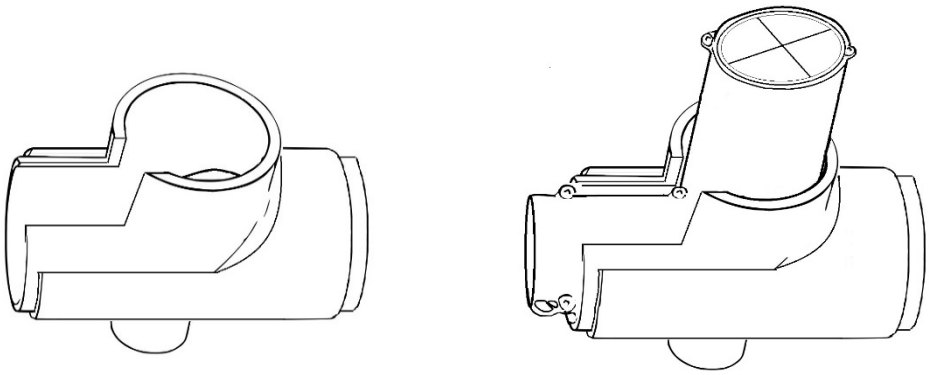

Figure 5. The densitometer should fit snuggly inside the PVC tee socket and the PVC socket within the PVC faucet tee

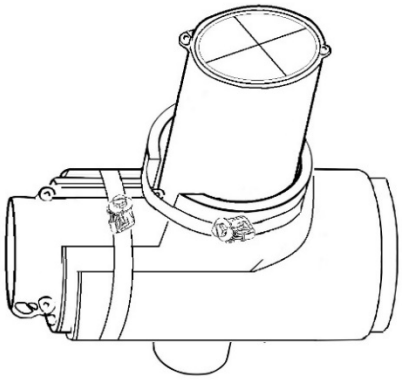

Figure 4. Densitometer mount fastened in place using hose clamps

11 If the extension pole does not have a thread to secure it to the base of the densitometer mount or if the thread does not match the thread of the PVC faucet tee on the densitometer mount, then use liquid nails adhesive to attach the reducing brush to the top of the pole (see Figure 6).

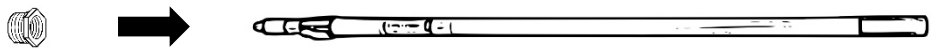

Figure 6. Attach a reducing brush with a thread that will fit the PVC faucet tee on the densitometer pole to the extension pole

12 On the lower half of the extension pole, use a tape measure and nail polish to mark 10 cm increments from the bottom of the pole up (see Figure 7).

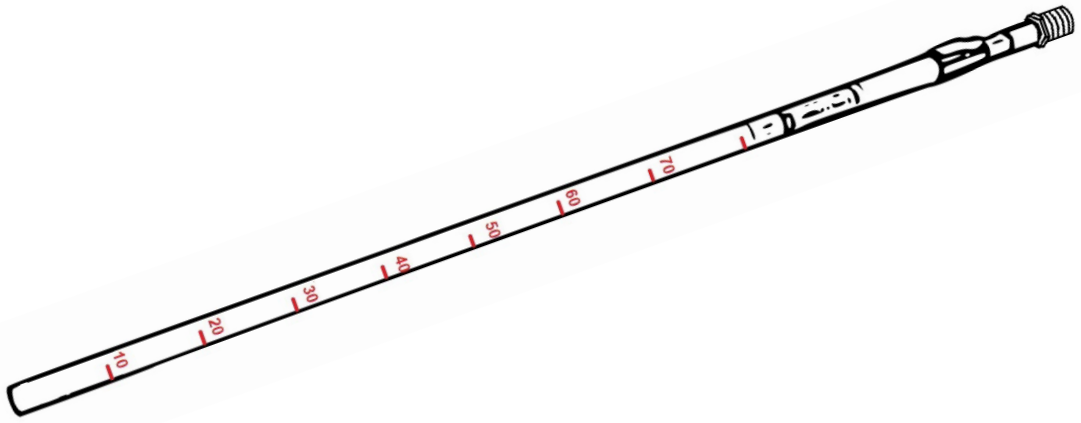

Figure 7. Extension pole marked every 10 cm.

13 Using duct tape, attach a laser pointer to the pole at a position that allows the observer to comfortably depress the laser's button and look through the densitometer without the need to readjust (see Figure 8)

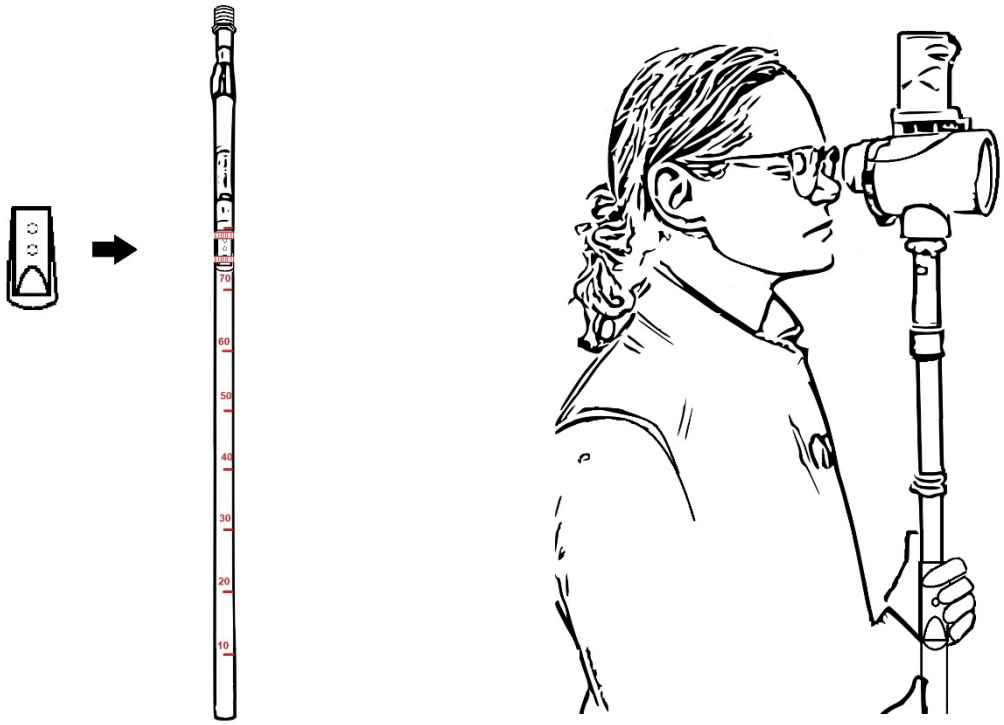

Figure 8. the laser pointer attached at a point comfortable for the observer to use without changing position when looking through the densitometer

Additional guidelines

- Nail polish is recommended for use over a permanent marker to mark the measurements on the extendable pole, as permanent marker readily rubs off.
- The position of the laser pointer may change depending on the observer's comfort and dominant hand and also to change batteries when necessary. Duct tape that can be removed and repositioned is therefore recommended instead of a more permanent fixture.
- It is recommended to carry a spare battery for the laser pointer or a spare, fully charged laser pointer and extra duct tape while in the field in case of the need for replacement mid-survey.