10.1071/WF23078
International Journal of Wildland Fire

Supplementary Material

Accounting for among-sampler variability improves confidence in fuel moisture content field measurements

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Supplementary Material

Field Course Sampling Protocol
Sampling strategy adapted from Norum and Miller (1984)

1. Equipment

- 2 pairs secateurs (one for cutting dead material, one for cutting live material)
- Aluminium, rust proof sampling containers with tight-fitting screw lids
- Masking tape for sealing tins
- Pen/clipboard/recording sheets
- Gardening gloves

2. *Calluna vulgaris* sampling strategy

Samples will be collected from the following fuel layers:

1. Live canopy
2. Live stems (<2 mm diameter)
3. Dead canopy
4. Dead stems (<2 mm diameter)
5. Moss layer (top 2 cm)
6. Litter layer (top 2 cm)

2.1 Set out a 25 m transect covering a representative area of the site. Starting with the live *Calluna,* walk along the transect taking the same size sample from each plant, collecting sprigs from approximately 10 plants (Figure S1). Clip the sprigs into small one-inch segments, separating the top shoots and canopy into one tin and the lower canopy and stems into another. Aim to take the same approximate mass for each sample of the same material and fill the tin ¾ full.
Nb. Live heather may look brown or grey early in spring. If you are unsure if it is live heather or dead bend the stem. Dead heather stems should easily break and be brown inside. Live heather stems will bend and be harder to break. The inside of the stem will be green.

2.2 Repeat step 1 but for dead heather plants.
Nb. You may find completely dead plants, sections of dead heather or sprigs that have been pulled out from grazing sheep.

2.3 In the same haphazard manner, collect moss along the transect by grasping the top 2 cm of moss and pulling it up from the moss layer. Clip off the highly decomposed dark brown moss from the base of the layer.

2.4 Collect litter in the same manner underneath *Calluna* plants, grasping the top 2 cm of litter above the organic soil layer.

2.5 As soon as you have collected the material for one tin, replace the lid tightly and seal it with masking tape.

2.6 Record the following details on your sampling sheet: the tin number for each fuel layer, sampling time, date and sampler name.

3. Laboratory protocol

3.1 Preheat drying oven to 80 ˚C.

3.2 Remove masking tape from tin lid, ensure no tape or debris is stuck to the tin.

3.3 Weigh sample, with the lid still on, to 3 dp and record this as the wet weight. Repeat for all samples.

3.4 Remove the lid and place it under the tin as you put the sample in the drying oven. Space the samples evenly in the oven so air can circulate.

3.5 Record the date and time the samples were put in the oven.

3.6 Dry samples for at least 48 hours at 80 ˚C.

3.7 Remove samples from the oven in batches, quickly replacing the lid tightly as each tin is removed to prevent absorption of moisture. Close the oven door in between batches.

3.8 Allow the tins to cool to room temperature before weighing them and record the dry weight (following step 3).

3.9 Calculate fuel moisture content (%) as mass of water as a percentage of the mass of the dried sample (Equation 1).

$$\text{Fuel moisture content} = \frac{(\text{sample wet weight} - \text{sample dry weight})}{(\text{sample dry weight} - \text{container tare weight})} * 100 \qquad \text{[Eq.1]}$$

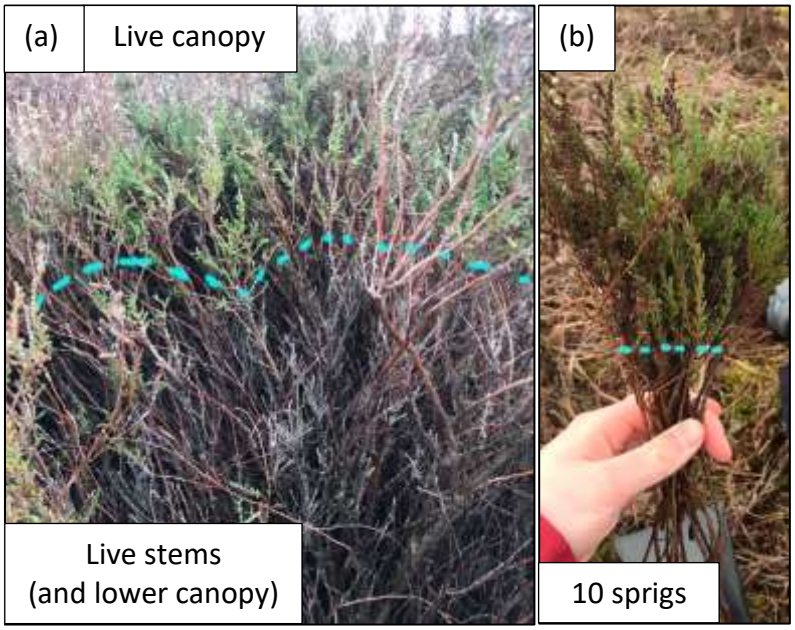

Figure S1 (a) Identifying live canopy material from live stems (and grey lower canopy material). (b) Collecting 10 sprigs as per step 2.1.

References

Norum R a., Miller M (1984) Measuring Fuel Moisture Content in Alaska: Standard Methods and Protocols. *General Technical Report* 1–40. doi:10.1016/S0140-6701(02)85652-1.

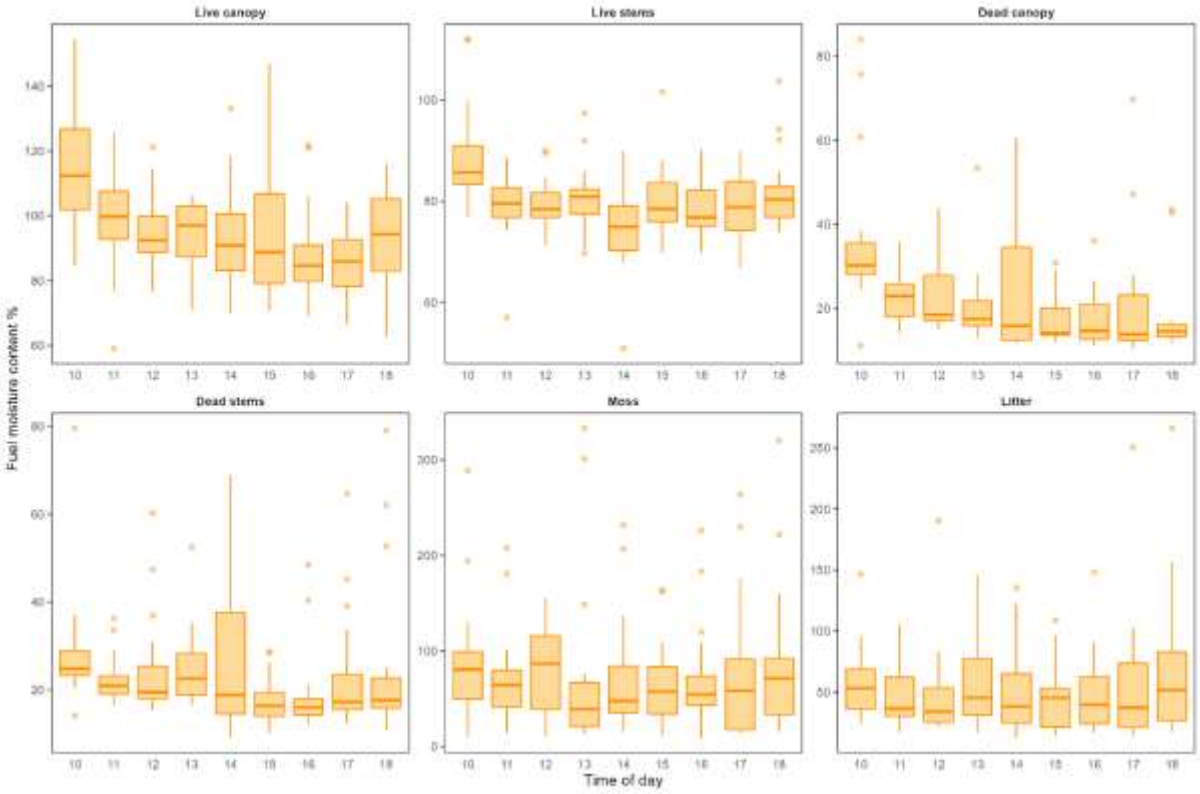

Figure S2: Measurement variability in fuel moisture content measurements for each fuel layer hourly from 10:00 to 18:00. Each y-axis is scaled independently to clearly visualise within-fuel layer measurement variability.