

# Fire Fuel Protocol: Transect Measurements

## Field Guide

### Task

Multiple measurements will be taken:

1. Slopes of individual transects,
2. Counts of the different sizes of downed woody fuel types,
3. Diameters and rot classes of logs greater than 8 cm,
4. Canopy cover and heights of shrubs less than 2-meters tall,
5. Herbaceous cover, and
6. Depths of litter and duff.

### What You Need

- Fire Fuel Transect Measurements Data Sheet
- Wooden stakes
- Flexible tape measure, at least 30 meters
- Compass
- Clinometer
- 0.5-0.65 cm wooden dowel
- 2.5 wooden dowel
- 2 clear rulers in mm
- Meter stick
- Garden trowel
- Clipboard
- Pencils or pens
- Colorful tape or flagging (optional)

### In the Field

#### Part 1: Measurements taken between the 5-meter and 15-meter marks along a transect

1. From the center of the site, lay a flexible tape measure due East (90°) for 30 meters. Keep the tape measure as tight and straight as possible.
2. If not already done, mark the 5- meter, 7-meter, 10-meter, 15-meter, and 25-meter distances with colorful tape or flagging.
3. Use a clinometer to measure the slope of the transect. Pick two students of approximately the same height. One student stands at the start of the transect with the clinometer while the other student walks 25 meters away along the transect. The student with the clinometer sights the eye of the other student and records the angle.
4. Starting at the 5-meter mark, walk to the 7-meter mark. Count the 0-1 cm, 1-3 cm, 3-8 cm, and 8+ cm fuel particles that cross the sampling plane of the transect between the 5 and 7-meter section of the transect. The sample plane starts at the ground surface and extends exactly 2 meters directly vertical above the ground surface. The diameter of the fuel particle is determined exactly where the particle crosses the sampling plane from the zero end. Use the 0.5-0.65 cm and 2.5 dowels and ruler to estimate size categories.

5. Use the ruler to measure the diameter of the downed woody fuel with diameters greater than 8 cm. Measure the diameter where the log crosses the sampling plane and perpendicular to the long axis of the log. Record the log decay class of each log.
6. Continue walking to the 10-meter mark. Count all 3-8 cm and greater than 8 cm downed fuel particles. Use the ruler to measure the diameter of the downed woody fuel greater than 8 cm. Record the log decay class of each log greater than 8 cm.
7. Continue walking to the 15-meter mark. Only count the downed woody fuel greater than 8 cm in diameter. Measure the diameter and record rot class for each log.

***Part 2: Measurements taken at the 15-meter mark***

8. At the 15-meter mark, estimate the canopy cover of live shrubs less than 2-meters tall within a circle that has a 1-meter radius. Make sure the plants have woody stems. Use the cover classes shown in Table FF-2.
9. Use the meter stick to estimate the average height of the live shrubs. Measure to the nearest 10 cm.
10. Estimate the cover of the dead parts of the shrubs less than 2-meters tall within the circle. Do not add those shrub branches that are unattached and lying on the ground. Use the cover classes shown in Table FF-2.
11. Use the meter stick to estimate the height of the dead shrub layer. Measure to the nearest 10 cm.
12. Estimate the percent cover of live herbaceous plants within the circle. Use the cover classes shown in Table FF-2.
13. Estimate the height of the live herbaceous layer
14. Estimate the percent cover of dead herbaceous plants within the circle. Use the cover classes shown in Table FF-2.
15. Estimate the height of the dead herbaceous layer
16. Between 20 and 30 cm to the right (as you face the end of the transect) of the 15-meter mark, use a garden trowel to cut through the litter and duff to the mineral soil. Try not to compress the litter and duff layer. Place the ruler with 0 end next to the mineral soil. Measure the thickness of the entire litter/duff layer with the ruler. If no place is available to measure duff and litter, enter '0' for duff and litter depth on data sheet.
17. Measure the thickness of the duff layer.

***Part 3: Measurements taken between the 15 and 25-meter marks***

18. Walk to the 25-meter mark. Count the downed woody fuel greater than 8 cm in diameter. Measure the diameter and record log decay class for each log.

***Part 4: Measurements taken at the 25-meter mark***

19. Repeat steps 8-17 for the 25-meter mark. These are the same measurements taken at the 15-meter mark.

***Part 5: Repeat measurements along next transect***

20. At the end of the transect, point the compass in a 330° direction. Lay a flexible tape measure in the 330° direction for 30 meters. Keep the tape measure as tight and straight as possible.
21. Repeat steps 2-19.
22. At the end of the transect, point the compass in a 210° direction. Lay a flexible tape measure in the 210° direction for 30 meters. Keep the tape measure as tight and straight as possible.
23. Repeat steps 2-19.
24. A total of 100 fuel particles for all size classes combined is requested. If this has not been reached, then lay out another transect in the 150° and repeat steps 2-19. A total of 7 transects can be measured as shown in Figure 3.