

Procedures used for plot sampling in the 2004/2005 Alaskan fires:

1. Upon the survey of an area, locate a patch of approximately 100 by 100 m which appears to be homogeneous in terms of ground cover, tree burn severity, and the fraction of standing and downed trees.
2. Upon entering the area, walk 20 paces in a random direction. At the completion of these, use the final location as the center of the plot.
3. Select a random direction between 0 and 180, and locate a 40 m long baseline in this direction, 20 m on each side of plot center.
4. Locate a 30 m sample transect perpendicular to the baseline, with the baseline bisecting the sample transect.
5. Select 2 random integers between 5 and 20, Locate a 2nd and 3rd sample transect perpendicular to each point, with the transects being located on either side of the center transect, and each being bisected by the baseline.
6. Collect a GPS location at plot center. Record the lat/long and altitude from the GPS, as well as the datum used to collect the data.
7. Measure and record the slope and aspect of the site, as well as slope position (e.g., flat area below base of slope, flat area along a stream or river, flat area on an outwash feature, flat area on ridge or hill crest, upper, middle or lower slope, toe-slope).
8. Take digital photographs, the first of a board or piece of paper containing the date and site name, and one photograph looking each direction along the baseline and center transects (either looking outward from plot center or inward from a distance of 10 m in each direction).
9. Visually estimate the amount of charred organic soil, singed/dead moss, tussocks (burned or live) live moss, bare mineral soil, and bare mineral soil covered by a shallow char layer in the plot. This is done by dividing the plot into four 10 x 10 m quadrants and visually estimating the ground cover in each quadrant.
10. Estimate and record the Alaskan CBI visual estimates of fire/burn severity.
11. Every 5 m along each sample transect beginning at 0 m and at distances of 5, 15, 25, and 35 m along the baseline, extract a 20 by 20 cm organic layer core, and measure the depth of the different organic layers present (e.g., litter, lichen, green moss, brown moss, fibric, mesic, and humic soils. Note if sample was extracted from a specific feature, such as a patch of unburned, a singed sphagnum hummock, a tussock, etc.
12. Collect samples from the organic layers to determine bulk density and %C of the surface organic layers (Merritt/Gordon provide description).
13. Every 5 m along each sample transect beginning at 0 m, select the nearest tree and measure the following: (a) note whether the tree is standing or laying down; (b) if obvious, note if tree were dead at time of the fire; (c) measure the basal diameter of the tree; (d) measure the distance from the top of the uppermost adventitious root to the minimum and maximum distances to the charred organic layer; (e) measure the depth of the minimum and maximum charred organic layers to the underlying mineral soil.

14. Within plus/minus 1 m of each sample transect, measure the following on all trees > 1 m in height: (a) basal diameter; (b) note whether the tree is standing or lying down; and (c) assign a burn severity category to the tree based on the following criteria:

0 – tree is living and had no foliage consumed by fire, all needles are green.

1 – tree has been killed, but no foliage consumed by fire. This category can be determined through the presence of brown needles on the tree itself or lying on the ground below the tree.

2 – Needles and some small secondary branches consumed by fire

3 – Some secondary branches are consumed, but some are still present on the tree

4 – All secondary branches consumed and > 30% of the primary branches consumed (e.g., some consumption of primary branches)

5 – < 30% of primary branches remain on tree

6 – No primary branches left, significant charring of the tree bole (note, if only charred stump of a tree remains, it typically was dead at the time of the fire.