ECOP Fire Monitoring Module Field Instructions
(Immediate post-burn measurements)

V2 Last Updated: September 25, 2025

V2 updates: Added clarifying language about measuring burn severity of substrate and vegetation. Added notes about what to do when this protocol is NOT paired with an ECOP base Disturbance Monitoring Protocol plot.

Supplies needed:

- Data collecting device (phone or tablet with Survey123 form 'ECOP Fire Monitoring Module' downloaded on your device (https://arcg.is/11OnyK0)
- OPTIONAL: Datasheets- burn severity and tree scorch/char (not needed if using Survey123 app, which is preferred)
- Report for ECOP monitoring plot data collected pre-treatment (this has information on trees and snags measured; obtain from ECOP Technical Coordinator)
- 1 chaining pin and three 50-ft tapes
- Laser rangefinder
- DBH tape
- Compass
- 1-m² PVC frame

Collect the following data as soon as possible after plot cools (and when it's safe!), which is generally within two to three weeks post-fire.

Note: Ideally this protocol is used in conjunction with an ECOP Disturbance Monitoring Protocol plot (installed before the fire event). If this is not the case, you can still use this protocol on its own, but you will need to make modifications for Page 6 - Tree Scorch and Char.

PAGE 1 - Plot Information

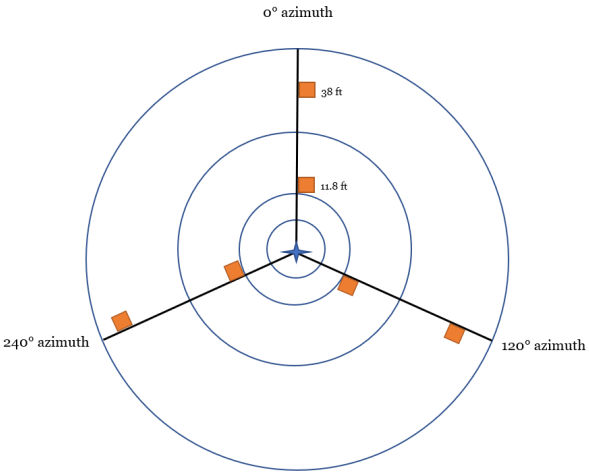
- Plot ID
- Observer Names
- Monitoring Date
- Plot Center Location (automatically taken when you open survey)
- Fire Date
- Fire Remarks

PAGE 2 - Photo Points

Same methodology as in the ECOP Disturbance Monitoring Protocol– take a photo straight on, standing over plot center and facing the ends of the 0, 120, and 240 degree transects. Take photos in the landscape orientation and consider using a monopod or other photo taking device that helps you take consistent photos from one visit to another. If possible, exclude people, gear, etc. from the photo. Plot ID, date, and azimuth will be recorded automatically in the file name for each photo, so there is no need for a whiteboard. There is also an option to take additional photos of unique fire effects within the plot.

Example of correct positioning for photo point.

PAGE 3, 4, 5 - Burn Severity Transects



Measure at 11.8 ft and 38 ft on each transect (six, 1-m² quadrats total per plot). Place the quadrat at 11.8 ft (equivalent to 11 ft and 9.6 inches) and 38 ft on the right-hand side of the transect. Bottom left corner of quadrat should be at the specified 11.8 or 38 ft locations.

Use Table PD-12 from the FIREMON protocol (see page 5 of this document) to assign each 1-m² quadrat a burn severity code for substrate and vegetation. Review forest, shrubland, and grassland vegetation columns and use what is most applicable to your site or that plot. Not applicable is an option for where there was no organic substrate present pre-burn (large rock covers entire quadrat surface) or if there was no vegetation present pre-burn.

From left to right: Substrate classified as scorched, lightly burned, and heavily burned.

It can be difficult to know what was growing within your plot before the fire event, especially if you don't have pre-fire data from the ECOP Disturbance Monitoring Protocol. Use your best judgement and you can always select "Not applicable" as your answer.

In some instances, there may be mixed burn severity within your 1-m² quadrat. Select the dominant burn severity of what you observe within the frame. For example, if 80% of frame would be classified as "scorched" and 20% of frame would be classified as "lightly burned", select "scorched" as your answer.

PAGE 6 - Tree Scorch and Char

Scorch is a result of radiant or convective heat from a fire and is represented by browning of needles or leaves. It may be difficult to distinguish between unburned dead foliage and scorched foliage on dead or near-dead trees. Scorched needles tend to be

droopy or curled, rather than upright or straight. Char results from flames and is represented by blackened tree boles and blackened soil/litter layers. See figures on page 6 of this document for graphical illustrations.

Record the following information for each tree in the plot that was measured pre-fire. If you have NOT completed the ECOP Disturbance Monitoring Protocol for this plot previously, you can collect information on trees within your plot following this guidance:

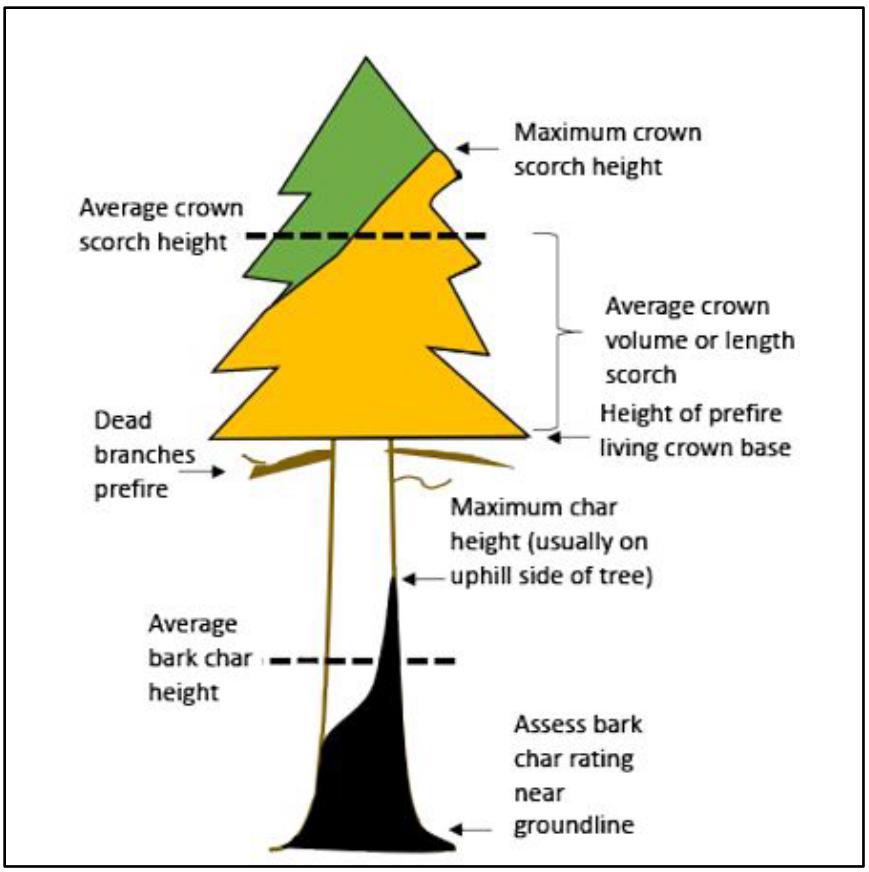
1) Within the 11.8 ft radius from plot center, measure trees with DBH ≥2.5" but <5".
2) Within the 24 ft radius from plot center, measures trees with DBH ≥5" but <24".
3) Within the full 50 ft radius from plot center, measure trees with DBH ≥ 24".

- Tree Species
- Tree ID (optional, if tree has tag from previous measurements)
- Azimuth from Plot Center
- Distance from Plot Center (ft)
- Tree Status: Options include standing tree, consumed or down tree, cut stump, and freshly resprouting oak. Standing tree would include a standing dead tree- the tree may have been alive in previous survey but is now dead and would be recorded as 100% scorched in following sections. If tree is standing, the following scorch and char measurements will also be taken.
- Crown Base Height (nearest ft): Height from the ground to the lowest live branch in the tree's crown.
- Percent Crown Scorched (nearest 5%): Percent of tree crown with browning needles or leaves caused by the heat from a fire.
- Maximum Scorch Height (nearest ft): The maximum height at which leaf mortality occurs due to heat generated by a fire. Below this height, most or all needles are brown and dead; above it, they are live and green.
- Percent Stem Base Charred (nearest 10%): Percent of tree base circumference (ground level) that is charred from fire.
- Maximum Char Height (nearest 0.5 ft): The maximum height of charred bark. Note that the maximum height is measured even if the char is patchy.
- Notes: Include any notes on the tree, recording interesting fire effects such as major branch loss, cavity consumption, etc.

Click submit and survey is complete! It is recommended to re-measure ECOP monitoring plots using the full Disturbance Monitoring Protocol at least one growing season after fire to observe the full effects of fire. At that point, any new snags will be measured fully.

Table PD-12—Use these fire severity class to determine the fire severity across the FIREMON macroplot.

Fire severity code	Substrate	Forest vegetation	Shrubland vegetation	Grassland vegetation
Unburned (5)	Not burned	Not burned	Not burned	Not burned
Scorched (4)	Litter partially blackened; duff nearly unchanged; wood/leaf structures unchanged.	Foliage scorched and attached to supporting twigs.	Foliage scorched and attached to supporting twigs.	Foliage scorched
Lightly burned (3)	Litter charred to partially consumed; upper duff layer may be charred but the duff is not altered over the entire depth; surface appears black; where litter is sparse charring may extend slightly into soil surface but soil is not visibly altered; woody debris partially burned; logs are scorched or blackened but not charred; rotten wood is scorched to partially burned.	Foliage and smaller twigs partially to completely consumed; branches mostly intact.	Foliage and smaller twigs partially to completely consumed; branches mostly intact; typically, less than 60 percent of the shrub canopy is consumed.	Grasses with approximately two inches of stubble; foliage and smaller twigs of associated species partially to completely consumed; some plant parts may still be standing; bases of plants are not deeply burned and are still recognizable.
Moderately burned (2)	Litter mostly to entirely . consumed, leaving coarse, light colored ash (ash soon disappears, leaving mineral soil); duff deeply charred, but not visibly altered; woody debris is mostly consumed; logs are deeply charred, burned out stump holes are evident.	Foliage twigs and small stems consumed; some branches still present.	Foliage twigs and small stems consumed; some smaller branches (0.25–0.50 inches) still present; typically, 40 to 80 percent of the shrub canopy is consumed.	Unburned grass stubble usually less than 2 inches tall, and mostly confined to an outer ring; for other species, foliage completely consumed, plant bases are burned to ground level and obscured in ash immediately after burning.
Heavily burned (1)	Litter and duff completely consumed, leaving fine white ash (ash disappears leaving mineral soil); mineral soil charred and/or visibly altered, often reddish; sound logs are deeply charred, and rotten logs are completely consumed.	All plant part consumed, leaving some or no major stems or trunks; any left are deeply charred.	All plant parts consumed leaving only stubs greater than 0.5 inch in diameter.	No unburned grasses above the root crown; for other species, all plant parts consumed.
Not applicable (0)	Only inorganic material on site before burn.	None present at time of burn.	None present at time of burn.	None present at time of burn.



Crown scorch and bark charring visual taken from OSU Extension Service.

Crown scorch and bark charring on ponderosa pine.

Maximum char height on oak tree.