# Logo  Description automatically generated with medium confidence**Designing the protocols**

1. What are the **SMART objectives** (specific, measurable, attainable, realistic, timebound)?
	1. TIP: talk to your specialists. Collecting information for them helps build relationships and programs.

What **story** do you want to tell, and what data do you need to collect to tell that story?

1. How much **time** will it take to complete each plot, and how much time do you have?
	1. *Factor in the time it will take to enter and report data.*

## **Plot Design**

**Fixed radius -** Application: Fuel loading with 1000hrs and trees. Good for pre/post measures

Snag plot
0.2 acres
74.4’ radius

Tree plot
0.1 acres
37.2’ radius *Mature and Saplings*

Seedling plot
0.01 acres
11.8’ radius *Seedlings*

**Macro** plot
100 M2 18.5’ (5.64m) radius *1000 hr fuels*

**Micro** plot
1 M2
*Surface fuels*

Duff and Litter
Near corner

1. Choose a **random** azimuth and distance.
2. Make sure there are **no anomalies** (i.e., trails, campfires, large brush piles) within the plot.
3. **Mark** the plot center – rebar, fiberglass pin, aluminum tree tag, or flagging around a tree
4. Use a **compass** to get lines as close to N/S and E/W as possible
5. **Mark** TWO corners of the frames so you can replace the frames in the same location later – pin flags, nails, or foil.
6. Starting from NORTH, take a **picture** from the plot center looking at the frame and one looking down on the frame.
7. Measure **1000** within the 18.5 foot radius
8. Measure **trees** starting from NORTH. Only include trees whose entire bole is in the plot (37.2 feet)

**Transect** – Application: Fuel loading without tree measurements. Good for pre/post measurements

1. Put a **permanent marker** at the beginning and end of the transect

0

15ft

30ft

45ft

60ft

**Micro** plot
1 M2 *Surface fuels*

Duff and Litter
Near corner

**Macro** plot - 100 m2
10mX10m **or** 20mX2m

1. Take a **picture** standing and one end looking at the other. Have a person stand at the other point for reference.
2. **Walk only on one side** of the transect
3. **Adjust the length** and location of the micro plots as necessary
4. **Add measurements** to the transect, such as line point intercept for species information
5. **Measure 1000 hrs** in the macro plot 100 m2 – either 10mX10m (32.8 ft X32.8 ft) or 20mX2M (65.6 ft X6.6 ft)

**Random** – Application: Fuel loading. Good for a general *measurements* of loading across a site

1. Locate an area with representative low, moderate, and high loading
2. Choose a random azimuth and walk a set distance (ex. 1 chain)
3. Place the plot and sample surface fuels and duff/litter
4. Use the macro plot method for 1000’s

**Macro plot** – Application: Fuel loading. Good for a general *estimate* of fuel loading across a site

1. Locate an area with representative fuel loading.
2. Obseve the loading pattern generally in the area to see how it varies
3. 1, 10, 100 - Find the Photoload reference that matches best with the general loading
4. Duff and Litter - Measure duff and litter in several places and get the average depth
5. 1000 – estimate the average length and diameter for the 1000s in a representative 10X10 meter area.

**Gather material –** what you need depends on what you are sampling

* + Maps and map apps (Avenza, Gaia, Field maps)
	+ Measurement tapes (100 ft., DBH tape)
	+ Compass
	+ Clinometer
	+ Guides (FBFM, Photoload, Slash guide)
	+ Plot frames
	+ Go No-go gauge and Ruler
	+ Permanent plot marker (Rebar, fiberglass post, pin flags, Aluminum foil)
	+ Wet erase markers for photo points
	+ Sampling sheets
		1. **Customize** to what you are collecting
		2. **Review** the database or modeling program where the data will be entered to be sure you collect everything you need.
		3. **Test** them out

## **Photo points**

1. Include a recognizable feature (ex. crooked tree, bridge, rock)
2. Lean against a tree to take the picture and mark the tree with flagging or a tag so you can find the tree again.
3. Consider using a photo point app like Before After Cam

## **Data entry and analysis**

1. Enter the data as soon as possible
	1. Organize and label the pictures
2. TIP: Have the person enter the data that collected the data. They can fill in the gaps with memory if needed, AND it will teach them how to do a better job collecting data in the future.
	1. Make figures and share the results of your data – tell a story with your data
	2. Create a protocol for entering and storing data
3. TIP: FFI (FEAT and FIRMON Integrated) is ideal for long-term monitoring

## **Recommended training on the Wildland Fire Learning Portal**

1. Understanding and Collecting Fuel Moisture
2. Understanding and Selecting Fire Behavior Fuel Models
3. Introduction to the Photoload Sampling Technique
4. Introduction to FFI (FEAT and FIRMON Integrated)

**Final Tip**

The more you monitor, the faster you will get
and *the more you will monitor.*

The more you monitor, the more you know.
The more you know, *the more you can do.*

## **Data sheets and other resources**

<https://sparkedresources.weebly.com/fuels.html>