

Northern California Province Monitoring Protocols



The intent of this guide is the streamline monitoring data collection for common fire, fuels and ecology treatments in the Northern Province; while standardizing the collection process and entry into the FFI database. This field guide is not intended to be a “catch all” for all monitoring, yet it is a tool that can be commonly used for most projects. To use this guide, you must first understand the objectives of your project and how much time, money and effort you will be putting into your monitoring – which determine what protocols are chosen and how many plots are needed. This guide has a list of common protocols used within FFI and a full description of the protocols frequently used in the Northern Province along with recommendations for how to establish associated plots. To have a successful and consistent approach, we suggest the following:

- Utilize FFI as the database to store and track your data. Store photos of plots in the database and back them up on your computer.
- Do not have too many monitoring projects. It is more useful to have a few that are successful rather than too many that constrain your ability to conduct post-treatment monitoring.
- Plan a sampling frequency that includes pre-treatment, immediate post-treatment, 1 yr. post, 2 yr. post, and 5 yr. post. Extend this sampling time frame as needed to meet project objectives.
- Use the naming convention of pre-treatment, immediate post-treatment, 1 year post-treatment, etc.
- Create a monitoring report and add additional information such as a Fire Effects Monitoring Report after each treatment. This puts the monitoring data to use and informs others of any findings.
- We recommend taking field trips post-treatment, discussing plots with other folks, and even having other disciplines assist with plots to gain more knowledge across disciplines for monitoring.

The list below are sampling methods that can be used to help meet your monitoring needs for the objectives outlined by your project. For a list of all FFI protocols/methods, sampling forms/data sheets, and field equipment checklist go to: <https://www.frames.gov/partner-sites/firemon/sampling-methods/> *The starred protocols below are the protocols commonly used by the Northern Province Ecology group and are included in this guide. Each protocol in the guide includes a description of data and a sample data sheet with required fields highlighted in yellow; other fields are optional.

***Plot description:** Used to describe site characteristics with biophysically based measurements that are meaningful to fire management. Photos of your plots can be stored here.

***Tree data:** Used for sampling individual trees in a fixed-area plot to estimate tree density, size, and age class distributions before and after vegetation alteration (i.e. fire) so that tree survival and mortality rates can be assessed. Tree data can also be used for estimating pre- and post-treatment canopy base heights along with basic fire effects to determine the effectiveness of a treatment. This protocol includes overstory trees, saplings and seedlings.

***Surface Fuel load:** Used to sample dead and down woody debris, depth of the duff/litter profile and estimate the proportion of litter in the profile. This method is generally used for fuel reduction objectives.

***Cover—Species composition:** Used to provide ocular estimates of canopy cover and height measurements for plant species on a macroplot. This method provides plant species composition and canopy coverage estimates to describe a stand or plant community. This method is less scientific, but can be conducted more rapidly than other cover methods (e.g. cover/frequency, line intercept, etc.).

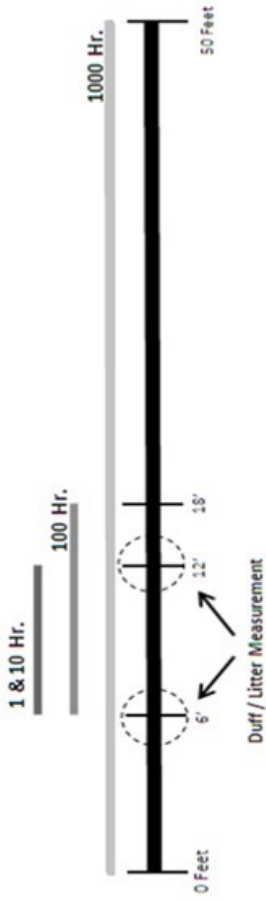
***Cover—Line intercept:** Used to assess changes in plant species cover for a macroplot. This method uses line transects to sample within stand variation and quantify statistically valid changes in plant species cover and height over time.

***Post Burn Severity & CBI:** Used to assess the impact of fire severity on various strata of fuels and vegetation

Cover/frequency: Used to assess changes in plant species cover and frequency for a macroplot. This method uses quadrats to sample within stand variation and quantify statistically valid changes in plant species cover, height, and frequency over time.

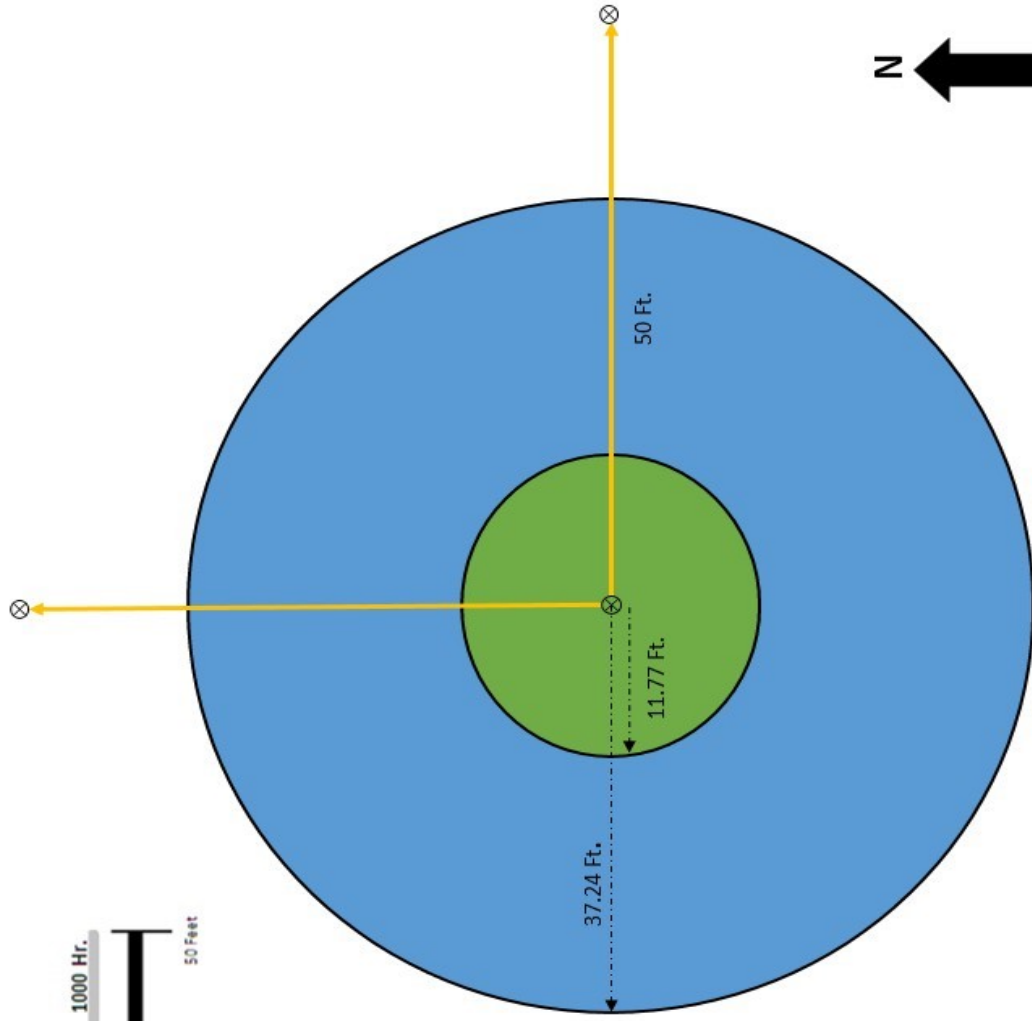
Point intercept: Used to assess changes in plant species cover or ground cover for a macroplot. This method uses a narrow diameter pole placed at systematic intervals along line transects to sample within stand variation and quantify statistically valid changes in plant species cover and height over time.

Density: Used to assess changes in plant species density and height for a macroplot. This method uses quadrats and belt transects to sample within stand variation and quantify statistically valid changes in plant species density and height over time.



Basic Procedures

1. Install transect tapes (install rebar if first visit)
2. Complete plot description, include photos in 4 cardinal directions
3. Complete surface fuel transects as shown in diagram above
4. Collect tree data (overstory, sapling and seedling)
5. Collect post fire data (if applicable)
6. Collect species composition – cover or line intercept
7. Collect additional project specific information (if applicable)



Plot Description:

- ⇒ Standard plot radius of 37.2 feet (1/10 acre plot) for overstory tree data and species composition, and radius of 11.8 feet (1/100 acre plot) for seedlings and saplings.
- ⇒ English units should be used for all plots.

Administrative Unit: Ranger District (Goosenest, etc...)

Project Unit: Monitoring project (Can be NEPA Project or Implementation Project. Examples: HCFP Underburns, Green Mountain, SFMU Rx burning, Goods, Weaverville Community Forest)

Macroplot: Monitoring type + number (i.e. for a Sagebrush plot: ARTR 1, ARTR 2 or Block I Plot 1)

Monitoring Status (Sample Event): Pre-treatment, pre-thin, post-thin, pre-burn, post-burn, 1yr post-burn, etc.

Date: Date data collected.

Fire Behavior and fuels: Record fuel model information and basic stand information. The new 40 fuel models are preferred (https://www.fs.fed.us/rm/pubs/rmrs_gtr153.pdf). A local guide for using these fuel models in the Klamath Mountains can be found at [https://ftp.nifc.gov/public/incident_specific_data/Fuels/CA_SHF/Fire%20Effects%20Monitoring%20\(FEMO\)/SB_Fuel_Model_PhotoGuide_AFAR_2020.pdf](https://ftp.nifc.gov/public/incident_specific_data/Fuels/CA_SHF/Fire%20Effects%20Monitoring%20(FEMO)/SB_Fuel_Model_PhotoGuide_AFAR_2020.pdf).

Plot Photos: Photo at each cardinal direction (4 total), record photo number for future use. Photos should include plot center and the entire transect (where transects are present) with as much canopy as possible. Document who took the data on the forms each visit.

Comments: Lat/long, UTM coordinates (including projection), and any information that is pertinent to the plot, including general directions and distinctive markings/flagging.

Be sure to mark plot center in some way. Methods include T post, rebar conduit or some other permanent locator to allow for re-measurement in the same location.



Plot Description

English Metric

Administration unit

Project unit

Macroplot

Monitoring status

Date

Field Crew

Radius/Length

Width

Landform, Geology, Soils

Landform

Verticle Shape

Horizontal Shape

Geology 1

Geology 2

Soil Texture

Erosion Type

Erosion Severity

Vegetation - Tree Cover

Tree Cover

Seeding Cover

Sapling Cover

Pole Cover

Med. Cover

Larger Tree Cover

Very Lg. Tree Cover

Erosion Severity

Vegetation - Shrub & Herbaceous Cover

Shrub Cover

Low Shrub Cover

Med. Shrub Cover

Tall Shrub Cover

Graminoid Cover

Forb Cover

Fern Cover

Moss/Lichen Cover

Vegetation Composition

Upper Species 1

Upper Species 2

Mid Species 1

Mid Species 2

Low Species 1

Low Species 2

PVT Code

Pot. Life form

Ground Cover

Bare Soil

Gravel

Rock

Duff

Wood

Moss/Lichen

Char

Ash

Basal Vegetation

Water

Fire Behavior and Fuels

Fuel Model Number

Fuel Model Code

Photo series

Stand Height

Canopy Base Ht

Canopy Cover

Flame Length

Spread Rate

Fire Behav. Pic.

Fire Sev. Code-Veg.

Fire Sev. Code-Sub.

Fire ID

Plot Photos

Photo 1

Photo 1 Az. 0

Photo 2

Photo 2 Az. 90

Photo 3

Photo 3 Az. 180

Photo 4

Photo 4 Az. 270

Photo 5

Photo 6

Photo 6 Az.

Photo 7

Photo 7 Az.

Photo 8

Photo 8 Az.

Photo 9

Photo 9 Az.

Photo 10

Photo 10 Az.

User Variables

UV 1

UV 2

UV 3

Comments

Include directions and lat/long with projection

Tree Data (TD):

Mature/Overstory Trees (individuals)

Collect information in highlighted fields. Note that there is a second page to include when doing immediate post-burn collection. Standard overstory tree plot size is 1/10 of an acre, radius of 37.2 ft. Trees above the breakpoint diameter are counted individually, trees with DBH below the breakpoint diameter are saplings.

Tag Number: Begin measuring trees to the North and start with tag number 1, placing the tag where DBH will be measured (4.5 feet above the ground). Additional trees will be collected in a clockwise fashion. If the central axis of tree is within plot radius, tree is counted. For trees on the border, alternate between counting as in or out. NOTE: all tags should face plot center. Angle nail downward so tag is not resting against bark.

Species: Enter the species in the form using 4-letter codes (e.g., PIPO for *Pinus ponderosa*). If the code is unknown, use the common name and determine the scientific name when you return to the office. NOTE: Common codes are provided at the end of this guide and additional codes can be found at plants.usda.gov.

Tree Status: H – Healthy, U – Unhealthy, S – Sick, D – Dead. (see below for definitions).

DBH: Diameter at breast height (4.5 feet above the ground) in inches. Measure /re-measure DBH at top of tag nail.

Height: Height of each tree in feet.

Live Crown Ratio: Percent of crown that is alive compared with what is dead (see chart on pg. 8).

Crown Class: Identify the crown class for each tree relative to the surrounding canopy see below

Crown Fuel Base Height: Height (in feet) to the base of the crown that would support a crown fire. General guide is to determine the lowest point on the bole where branches are present in at least two quadrats.

Mortality Cause: If status is dead, determine probable cause if there is sufficient evidence (see table pg. 8).

Decay Class: If status is dead, record snag decay class (see table on pg. 8 for class descriptions).

Tree Status

H – Healthy tree with very little biotic or abiotic damage.

U – Unhealthy tree with some biotic or abiotic damage, and this damage will reduce growth. However, it appears the tree will fully recover from this damage.

S – Sick tree with extensive biotic or abiotic damage and this damage will ultimately cause death within the next 5 -10 years.

D – Dead tree or snag with no living tissue visible.

Crown Class

O – Open grown, or the tree is not near any other tree.

E – Emergent, or the crown is totally above the canopy of the stand.

D – Dominant, or the crown receives light from at least 3 -4 directions.

C – Codominant, or the crown receives light from at least 1-2 directions.

I – Intermediate, or the crown only receives light from the top.

S – Suppressed, or the crown is entirely shaded and underneath the stand canopy.

Trees

Overstory Individuals Page 1 of 2

English

Metric

Page

Plot area	1/10 Acre - Radius 37.2 Ft.
Snag plot area	1/10 Acre - Radius 37.2 Ft.
Break point diameter	5"
Collected by	
Entered/verified by	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	

Tag #	Species	Status	DBH	Height	Crown ratio	Crown class	Live cm base ht.	Cm fuel base ht.	Crown radius	Quarter	Subplot fraction	Mortality Cause	Decay class

Tree Data (TD):

Mature/Overstory Trees (individuals) Cont'd

Collect the following information for immediate post-fire sampling events (highlighted in orange).

Bole char height: Record height of char on bole immediately following fire (feet).

Scorch height: Record height of scorch in crown of tree (feet).

Crown scorch %: Record percent of crown appearing scorched (see table below).

Live Crown Ratio and Crown Scorch Classes	
Code	Live Crown or Crown Scorch Percent
0	Zero percent
0.5	> 0 -1 percent
3	> 1 – 5 percent
10	> 5 – 15 percent
20	> 15 – 25 percent
30	> 25 – 35 percent
40	> 35 – 45 percent
50	> 45 – 55 percent
60	> 55 – 65 percent
70	> 65 -75 percent
80	> 75 – 85 percent
90	> 85 -95 percent

Mortality Codes	
Mortality Code	Description
F	Fire caused
I	Insect caused
D	Disease caused
A	Abiotic (flooding, erosion)
H	Harvest caused
U	Unable to determine
X	Did not assess

Snag Decay Class Descriptions					
Snag Code	Limbs	Top of Bole	Bark	Sapwood	Other
1	All Present	Pointed	100% remains	Intact	Height Intact
2	Few, Limbs	May be broken	Some loss, variable	Some Decay	Some loss in height
3	Limb stubs only	Usually broken	Start of sloughing	Some sloughing	Broken top
4	Few or no limb stubs	Always broken some rot	50% or more loss of bark	Sloughing evident	Loss in height always

Trees

English

 X

Metric

Page

Overstory Individuals Page 2 of 2

Plot area	1/10 Acre - Radius 37.2 Ft.
Snag plot area	1/10 Acre - Radius 37.2 Ft.
Break point diameter	5"
Collected by	
Entered/verified by	
UVI description	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	

Tag #	Num. live stems	Num. dead stems	Bole Char ht.	Scorch ht.	Crown scorch	Damage code 1	Severity code 1	Damage code 2	Severity code 2	Comment	UVI

Tree Data (TD) :

Saplings (by diameter class)

Saplings are trees greater than 4.5' tall (meaning they have a DBH) and less than the breakpoint DBH (standard breakpoint DBH is 5"). Record the number of saplings of each species present broken into the size classes described in the table below. Standard plot size for saplings is 1/100 of an acre, or a radius of 11.8 feet.

Diameter class: Size class of saplings based on their DBH using the table provided below.

Species: Enter the species in the form using 4-letter codes (e.g., PIPO for *Pinus ponderosa*). If the code is unknown, use the common name and determine the scientific name when you return to the office.

NOTE: Common codes are provided at the end of this guide and additional codes can be found at plants.usda.gov in the search sidebar.

Status: H – Healthy, U – Unhealthy, S – Sick, D – Dead (same as for overstory trees)

Count: Count the number of saplings in each size class for each species present in the plot.

Average height: For each species, record the average height of each size class in feet.

Sapling Classes	
Class	Diameter (in)
0.5	> 0 -1
1.5	> 1 -2
2.5	> 2 – 3
3.5	> 3 – 4
4.5	> 4– 5

Trees by Diameter Class

English

X

Metric

Page

Saplings

Saplings = trees over 4.5 ft tall with DBH less than 5"

Plot area	1/100 Acre - radius 11.8 ft.
Collected by	
Entered/verified by	
UV1 description	
UV2 description	
UV3 description	

Date	
Administration unit	
Project unit	
Macro plot	

Diameter class	Species	Status	Count	Avg- height	Avg- cm ratio	Subplot fraction	Comment	UV1	UV2	UV3

Tree Data (TD):

Seedlings (By Height class)

Seedlings are trees less than 4.5' tall (meaning they do not have a DBH). Standard plot size for seedlings is 1/100 of an acre, or a radius of 11.8 feet.

Height Class: Height class of seedlings based on their height using the table provided below.

Species: Enter the species in the form using 4-letter codes (e.g., PIPO for *Pinus ponderosa*). If the code is unknown, use the common name and determine the scientific name when you return to the office.

NOTE: Common codes are provided at the end of this guide and additional codes can be found at plants.usda.gov in the search sidebar.

Count: Count the number of seedlings in each height class for each species present in the plot.

Seedling Classes	
Class	Height Range (ft.)
0.2	> 0.0 – 0.5
1	>0.5 – 1.5
2	>1.5 – 2.5
3	> 2.5 – 3.5
4	> 3.5 – 4.5

Trees by Height Class

Seedlings

Seedlings = trees less than 4.5 Ft tall

Plot area	1/100 Acre - radius 11.8 ft.
Collected by	
Entered/verified by	
UV1 description	
UV2 description	
UV3 description	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	

Height class	Species	Status	Age class	Count	Avg. diameter	Subplot fraction	Comment	UV1	UV2	UV3

Surface Fuels.

The surface fuel protocol utilizes transects to collect information on the dead surface fuels present in each plot. Fuels within 6 feet of the surface are counted. These surface fuels are collected in 3 categories, each with its own datasheet:

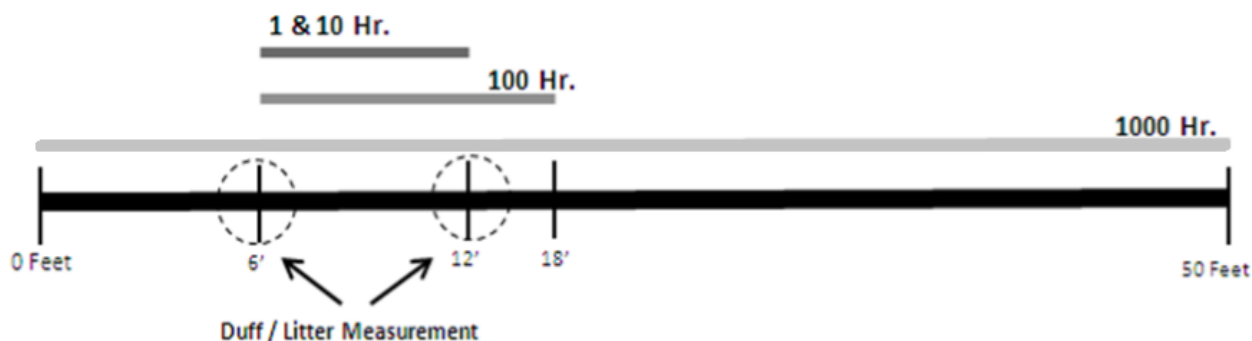
1. Fine woody debris (FWD)
2. Coarse woody debris (CWD)
3. Litter and duff

See table below for differentiation between FWD and CWD.

General Procedure:

1. Run two transect tapes (50 feet) starting from plot center; one North and one East
2. Record the slope
3. Tally 1hr fuels from 6-12 feet
4. Tally 10hr fuels from 6-12 feet
5. Tally 100hr fuels from 6-18 feet
6. Take a litter and duff depth measurement at 6 feet and 12 feet
7. Record diameter and decay class (see table on pg. 16) for each 1000hr fuel that crosses the transect anywhere along the entire 50 ft. Diameter should be taken at the intersection.

Don't worry about the CWD Fuel Con Set



Dead Wood Class		
Woody Debris Type	Time Lag Category	Size (inches)
FWD	0 hour	0 to 0.25"
FWD	10 hour	0.25" to 1.0"
FWD	100 hour	1.0" to 3.0"
CWD	1,000 hour	3.0" and greater

Surface Fuels

FWD

English

Metric

Page

Num. Transects	2
1-hr Tran. Len.	6 ft
10-Hr Tran. Len.	6 ft
100-hr Tran. Len.	12 ft
Collected by	
Entered/verified by	
UV1 description	
UV2 description	
UV3 description	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	

Transect	Azimuth	Slope	1-hr count	10-hr count	100-hr count	FWD FuConSt	Comment	UV1	UV2	UV3

Surface Fuels—Coarse Woody Debris

CWD Decay Class

Decay class 1: All bark is intact. All but the smallest twigs are present. Old needles probably still present. Hard when kicked.

Decay class 2: Some bark is missing, as are many of the smaller branches. No old needles still on branches. Hard when kicked.

Decay class 3: Most of the bark is missing and most of the branches less than 1 inch in diameter also missing. Still hard when kicked.

Decay class 4: Looks like a class 3 log but the sapwood is rotten. Sounds hollow when kicked and you can probably remove wood from the outside with your boot. Pronounced sagging if suspended for even moderate distances.

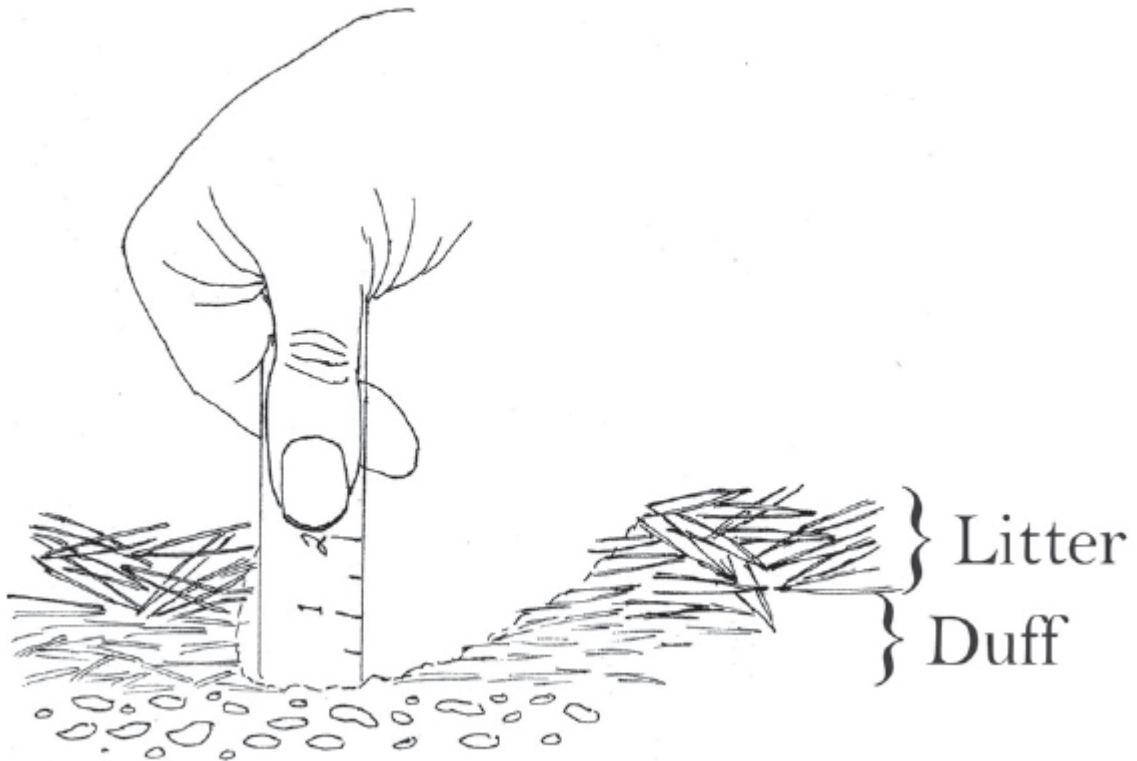
Decay class 5: Entire log is in contact with the ground. Easy to kick apart but most of the piece is above the general level of the adjacent ground. If the central axis of the piece lies in or below the duff layer then it should not be included in the CWD sampling as these pieces act more like duff than wood when burned.

Surface Fuels—Litter and Duff

Measure litter and duff depth to nearest 1/10th of an inch. Use a trowel or shovel to dig down and pull away the litter and duff layer to leave a profile of the litter and duff that is as undisturbed as possible.

Litter is loose organic material whose source is readily determined.

Duff is decomposing organic material. Its source is not readily determined but it is obviously organic in nature and can be distinguished from the mineral soil beneath.



**Surface Fuels
Duff and Litter**

English Metric Page

Num. Transects Collected by	2	Date	
Entered/verified by		Administration unit	
UV1 description		Project unit	
UV2 description		Macro plot	
UV3 description		Monitoring status	

Transect	Sample location	Offset	Litter depth (in)	Duff depth (in)	Fuelbed depth (ft)	DL FuConSt	Comment	UV1	UV2	UV3
1	6 ft.									
1	12 ft.									
2	6 ft.									
2	12 ft.									

Cover—Species Composition

Collect information in highlighted fields.

Item Code: Typically only shrub/ground cover species are collected in this protocol, however, tree cover may be an important factor in some projects. Ideally item code is the 4 letter species code. Due to difficulty in plant identification, species can be grouped by life form, typical categories include shrub, herb, and grass. If tree cover is being assessed, attempt to determine by species, if not possible, lump into species category of tree. Species codes can be found on the [USDA plants website](#).

Status: Live or dead status of species or life form group.

Size Class: See tables below. TO for total cover indicates one entry for all individuals of that item code, not broken into size categories.

Cover: % cover from species or life form status/size combination within the plot area (1/10th acre) .

Height: Average height (feet) of individuals in the item code/status/size class combination.

Status Codes	
Code	Description
L	Live
D	Dead
NA	Not Applicable

Shrub and Herbaceous Size Class	
Codes	Description (English)
TO	Total Cover
SM	Small <0.5 feet
LW	Low 0.5 < 1.5 feet
MD	Medium 1.5 < 4.5 feet
TL	Tall 4.5 < 8 feet
VT	Very Tall > 8 feet
NA	Not Applicable

Tree Size Class	
Codes	Description (English)
TO	Total Cover
SE	Seedling < 1" DBH or < 4.5 feet
SA	Sapling 1" < 5" DBH
PT	Pole Tree 5" < 9" DBH
MT	Medium Tree 9" < 21" DBH
LT	Large Tree 21" < 33" DBH
VT	Very Large Tree > 33" DBH
NA	Not Applicable

Cover Species Composition

Min. cover level	Date
Plot area	Administration unit
Collected by	Project unit
Entered/verified by	Macro plot
UV1 description	Monitoring status
UV2 description	
UV3 description	

1/10 Acre - 37.2 ft radius

Item code	Status	Size class	Age class	Cover (%)	Height	Comment	UV1	UV2	UV3

Cover – Line Intercept

This protocol collects information about species that are intersected along one or more transects. If collecting surface fuel loading transects, the same transect can be used for this protocol. If additional transects are needed, adding the remaining cardinal directions is recommended (South and West).

This protocol can be used to collect any plant that intercepts the transect and can be broken down by individual species. For the sake of simplicity, item codes can be lumped into grass, forb, and shrub, similar to species composition. Further simplification can be achieved by collecting only shrub species or only grasses/forbs, depending upon vegetation type and project goals. Each individual that crosses the transect is recorded on its own line of the datasheet.

Collect information in highlighted fields.

Transect: Direction (degrees or cardinal direction) or transect number. Be sure to note transect azimuth if using numbers instead of direction.

Item Code: Typically only shrub/ground cover species are collected in this protocol, however, tree cover may be an important factor in some projects. Ideally item code is the 4 letter species code. Due to difficulty in plant identification, species can be grouped by life form, typical categories include shrub, herb, and grass. If tree cover is being assessed, attempt to determine by species, if not possible, lump into species category of tree. Species codes can be found on the USDA plants website.

Status: Live or dead status of species or life form group.

Start: Where the plant begins to cross the transect (in feet and inches)

Stop: Where the plant ends on the transect (in feet and inches)

Height: Average height of the shrub

Cover

English Metric

Page

Num. transects	2
Transect length	50 ft.
Collected by	
Entered/verified by	
UV1 description	
UV2 description	
UV3 description	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	

Transect	Item code	Status	Size class	Age class	Start	Stop	Height	Subplot fraction	Comment	UV1	UV2	UV3

Post Burn Severity

Use this protocol to document fire effects immediately post-burn. Collect at least the information in the highlighted fields. If using this protocol along with surface fuel transects, the same transects can serve as locations for collecting severity data. However, the number of plots may need to be increased in order to capture the true variability of fire effects throughout a large unit or a unit that experienced a high level of mosaic fire effects.

Transect: transect number or direction

Point: the number for that point along the transect

Tape: distance or location on measuring tape of the point

Vegetation Severity: Rate severity effects on vegetation from unburned to heavily burned.

Substrate Severity: Rate severity of fire effects on litter, duff and soil.

Guidance on severity ratings can be found on page 110 of the NPS [Fire Monitoring Handbook \(FMH\)](#).

Post Burn Severity

English

X

Metric

Page

Num. Transects	
Transect Len.	
Num. points/tran.	
Plot type	
Plot area	
Collected by	
Entered/verified by	

Date	
Administration unit	
Project unit	
Macro plot	
Monitoring status	
UV1 description	
UV2 description	
UV3 description	

Transect	Point	Tape	Vegetation severity	Substrate severity	Comment	UV1	UV2	UV3

Post Burn Severity—CBI

Use this protocol to document fire effects immediately post-burn in order to create a unit wide composite burn index (CBI). This protocol is often used to validate remote sensing data and to assist in improving the accuracy of remotely sensed fire severity data.

If this method is desired for post-burn monitoring, random points are recommended. Multiple people improve the overall accuracy of the ratings and a general consensus between multiple raters is desirable for this protocol.

See the PDF version of the data collection form for instructions on how to rate the various components of CBI.

FFI -- BURN SEVERITY -- COMPOSITE BURN INDEX

PD - Abridged		Examiners:		Fire Name:	
Administrative Unit		Project Unit		Macro Plot	
Field Date <small>mmddyyyy</small>	/ /	Fire Date <small>mmyyyy</small>	/		
Plot Aspect		Plot % Slope		UTM Zone	
Plot Diameter Overstory		UTM E plot center		GPS Datum	
Plot Diameter Understory		UTM N plot center		GPS Error (m)	
Number of Plot Photos		Plot Photo IDs			

BI -- Long Form	% Burned 100 feet (30 m) diameter from center of plot =	Fuel Photo Series =					
STRATA RATING FACTORS	BURN SEVERITY SCALE						FACTOR SCORES
	No Effect	Low		Moderate		High	
	0.0	0.5	1.0	1.5	2.0	2.5	

A. SUBSTRATES

% Pre-Fire Cover: Litter =		Duff =		Soil/Rock =		Pre-Fire Depth (inches): Litter =		Duff =		Fuel Bed =		Σ =
Litter/Light Fuel Consumed	Unchanged	–	50% litter	–	100% litter	–	80% light fuel	–	98% Light Fuel			
Duff	Unchanged	–	Light char	–	50% loss deep char	–	Consumed				N =	
Medium Fuel, 3-8 in.	Unchanged	–	20% consumed	–	40% consumed	–	–	–	60% loss, deep ch			
Heavy Fuel, > 8 in.	Unchanged	–	10% loss	–	25% loss, deep char	–	–	–	40% loss, deep ch			
Soil & Rock Cover/Color	Unchanged	–	10% change	–	40% change	–	–	–	80% change			
CBI 1												

B. HERBS, LOW SHRUBS AND TREES LESS THAN 3 FEET (1 METER):

%Pre-Fire Cover =		% Enhanced Growth =		Σ =
% Foliage Altered (blk-brn)	Unchanged	–	30%	
Frequency % Living	100%	–	90%	
Colonizers	Unchanged	–	Low	
Spp. Comp. - Rel. Abund.	Unchanged	–	Little change	
CBI 1				

C. TALL SHRUBS AND TREES 3 to 16 FEET (1 TO 5 METERS):

%Pre-Fire Cover =		% Enhanced Growth =		Σ =
% Foliage Altered (blk-brn)	0%	–	20%	
Frequency % Living	100%	–	90%	
% Change in Cover	Unchanged	–	15%	
Spp. Comp. - Rel. Abund.	Unchanged	–	Little change	
CBI 1				

D. INTERMEDIATE TREES (SUBCANOPY, POLE-SIZED TREES)

%Pre-Fire Cover =		Pre-Fire Number Living =		Pre-Fire Number Dead =		Σ =
% Green (Unaltered)	100%	–	80%	–	40%	
% Black (Torch)	None	–	5-20%	–	60%	
% Brown (Scorch/Girdle)	None	–	5-20%	–	40-80%	
% Canopy Mortality	None	–	15%	–	60%	
Char Height	None	–	1.5 m	–	2.8 m	
CBI 1						

Post Fire: %Girdled = %Felled = %Tree Mortality =

E. BIG TREES (UPPER CANOPY, DOMINANT, CODOMINANT TREES)

%Pre-Fire Cover =		Pre-Fire Number Living =		Pre-Fire Number Dead =		Σ =
% Green (Unaltered)	100%	–	95%	–	50%	
% Black (Torch)	None	–	5-10%	–	50%	
% Brown (Scorch/Girdle)	None	–	5-10%	–	30-70%	
% Canopy Mortality	None	–	10%	–	50%	
Char Height	None	–	1.8 m	–	4 m	
CBI 1						

Post Fire: %Girdled = %Felled = %Tree Mortality =

Community Notes/Comments:	CBI = Sum of Scores / N Rated:	Sum of Scores	N Rated	CBI
	Understory (A+B+C)			
	Overstory (D+E)			
	Total Plot (A+B+C+D+E)			

% Estimators: **20 m Plot:** 314 m² 1% = 1x3 m 5% = 3x5 m 10% = 5x6 m *After, Key and Benson 1999, USGS NRMSC, Glacier Field Station.*
30 m Plot: 707 m² 1% = 1x7 m (<2x4 m) 5% = 5x7 m 10% = 7x10 m *Version 4.0 8/27, 2004 (updated 11/26/07 for FFI)*
 Strata and Factors are defined on the reverse side of this form. See the FIREMON Landscape Assessment, Chapter 2, available at <http://frames.nril.gov/firemon>, for more information.

Common Klamath Species Codes:

Trees:

<u>Common Name</u>	<u>Code</u>
Western Juniper	JUOC
White Oak	QUAL
California Black Oak	QUKE
Canyon Live Oak	QUCH2
Ponderosa Pine	PIPO
Sugar pine	PILA
Jeffrey Pine	PIJE
Lodge pole Pine	PICOM
Knobcone Pine	PIAT
Gray Pine	PISA2
Pacific Madrone	ARME
Incense Cedar	CADE27
White fir	ABCO
Red fir	ABMA
Douglas fir	PSME
Port Orford Cedar	CHLA
Pacific yew	TABR2
Bigleaf Maple	ACMA3
Quaking Aspen	POTR10

Shrubs:

<u>Common Name</u>	<u>Code</u>
Manzanita	ARCTO3
Whiteleaf manzanita	ARMA
Greenleaf Manzanita	ARPA6
Pinemat Manzanita	ARNE
Buck Brush Ceanothus	CECU
Snowbrush Ceanothus	CEVE
Antelope Bitterbrush	PUTR2
Tanoak	NODE3
Sadler oak/ Deer oak	QUSA2
Giant Chinquapin	CHCH7
Curl leaf mountain mahogany	CELE3
Big Sagebrush	ARTR2

Equipment List:

Camera	Plastic Bags	Sharpie	Yardstick
Calculator	Clinometer	Fuels Go no Go Gauge	
Clipboard	Notebook	Flagging	DBH Tape/logger tape
Compass	Rebar/conduit	Pencils	2 x 75' Tapes
GPS	Clear 6" ruler with inches and tenths		
Orange marking paint	tree tags		

Data Sheets: (Field data sheets can be found at www.frames.gov/partner-sites/ffi/documents/ sheets are located under the field data forms tab.)