Appendix A.

Field Form for Documenting Presence/No Detection and Habitat for
SURVEY AND MANAGE AND PROTECTION BUFFER BRYOPHYTES

Map ID: _____Date of Survey: _____
Surveyor(s) _____
Species documented: _____
Species surveyed for, but not located: _____
Land Ownership: BLM USFS Other _____
Forest and District/BLM District and Resource Area (name, not number) _____
Land Allocation: LSR MLSA matrix ACEC RNA BSIA RR Wilderness Other _____
State _____ County _____ Quad Name _____ 7.5 15 min.
Specific Location: (fill out either latitude/longitude or UTM to 150 ft. level of accuracy)
Lat. _____° _____' _____" **Long.** _____° _____' _____" **Meridian:** Willamette Mt. Diablo Humboldt
UTM X _____ Y _____ UTM Zone: _____
Legal Description: T_____ R _____ S _____ ____ 1/4 of ____ 1/4
Location: _____
_____
_____
_____
Stand Structure/Composition: _____
_____
_____
Plant Association _____
Successional Stage/Stand Age: _____
Vegetation Zone/Series: _____
Aspect: ____degrees **Elevation:**_____ feet meters
Slope: _____% steep, moderate, gentle, flat **Light:** full sun, partial shade, full shade
Landform: ridgetop, upper slope, mid slope, lower slope, valley bottom, riparian
Topographic Moisture: extremely dry; very dry; dry, well-drained; dry mesic; mesic; moist mesic; moist, well-watered; wet; standing water
Microsite moisture: dry, mesic, moist, wet
Habitat: forest, meadow, wetland, seep, spring, waterfall, intermittent stream, perennial stream, river, wetland, margin of lake or pond, splash zone, high water line, submerged, cut bank, along a trail, along roadside
Other: _____ **Threats: _____**
Photographs Taken? Yes No (if yes, of taxon or habitat)
<u>Fill out the following if species was located:</u> **New Site?** Yes No
Abundance and Distribution: very rare (limited to one thallus or clump), rare (several thalli or clumps) restricted to small area (e.g., one tree); occurring sparsely throughout ____ (size) area; occurring commonly throughout ____ (size) area; occurring abundantly throughout ___ (size) area
Substrate: *Mineral soil:* gravel, sand, loam, silt, clay Other _____
circle all that apply *Organic:* litter (deciduous, conifer), duff, wood, peat, moss Other_____
Rock: granitic, metamorphic, sedimentary, igneous, volcanic, calcareous
Feature: outcrop, cliff, crevice, underhang, terrace, boulder, talus, scree
Tree or Shrub: species _____ *Location:* base, trunk, branch, root
stump, snag, recently fallen log, rotten log (decay class if known_____),
bark, wood, tree root-wad, litterfall

<u>Fill out the following if specimen was collected:</u>
Collector_____ Collection Number: _____Date: _____
Voucher sent to Regional Program for verification and forwarding to Regional Herbaria: yes no
Location of Voucher(s):_____
Identification By_____ Date of ID _____
Verified by_____ Date entered into ISMS _____

Directions for the Bryophyte and Lichen Survey Strategy 2 Field Form

Map ID: Unique identifier (code), generated by field user, used to cross-reference attached maps

Species surveyed for, but not located: scientific name(s), including genus and species of bryophyte and lichen species for which high probability habitat was suspected, but species were not encountered during survey

Land Ownership: indicate the name of the Forest and Ranger District or BLM District and Resource Area

Land Allocations: If known, specify if this location is in a Late-successional Reserve, Managed Late-successional Area, matrix, Adaptive Management Area, Area of Critical Environmental Concern, Research Natural Area, Botanical Special Interest Area, Riparian Reserve, Wilderness. Circle all that apply. If other, describe.

Quad Name(s): full name(s) of the quadrangles used (do not abbreviate), circle either 7.5 or 15 min. scale

Location: Provide clear and detailed directions, sufficient to relocate population. Give directions from general to specific, except list the Survey site name first. Be sure to include road numbers, mileages from road junctions, and distance and azimuth (0-360 degrees) from the road. Make it clear which part is driving and which part is walking. Map the location on the appropriate topographic map (7.5 or 15 min.) and label with quad name, township, range, and section.

Specific Location: fill in the appropriate Meridian, (Willamette or Diablo Meridian) and either the UTM x and y coordinates and UTM Zone or the latitude/longitude in degrees, minutes, and seconds
Stand Structure/Composition: provide a brief description of the stand structure and or composition including dominant species of overstory and understory

Plant Association: fill in the correct plant association if known, and name of plant association guide used

Successional Stage: fill in the appropriate successional stage (i.e., young, mature, old growth) and include stand age, if known

Abundance and Distribution: estimate of quantity and spacing of bryophyte or lichen within the stand

Substrate: This information is needed for the identification of most bryophytes because substrate plays an important role in determining where a species will grow. Additional information will also help us to broaden our understanding of where these species occur and will help to confirm that the identification was correct. Specify soil characteristics with regard to duff or organic content and soil texture, parent material (rock type), and landform. If epiphytic, provide the name of the host tree or shrub species.

Topographic Moisture: relative amount of soil water due to gravitational redistribution of water (as function of slope shape, position, and steepness)
Aspect: record in degrees azimuth (0-360)

Collector: name of the person who collected the material

Surveyor: name of the person completing the survey

Coll. Number: number that the individual who collected the material assigned to the collection, number should correspond to their field notebook.

Identification by: name of the person who verified the identification of the material

Location of Voucher: Voucher specimens should be forwarded to the Interagency Regional Bryologist/Lichenologist, who will deposit them in the appropriate Regional Herbarium. If duplicates remain on the local USFS District or BLM Resource Area, then also specify that location. If specimen is in a personal collection, provide the name of the individual.

APPENDIX B. FIELD FORMS FOR PROTECTION BUFFER BRYOPHYTE SPECIES

1. Plot Card for Site and Plant Community data
2. Cryptogam field form for recording microsite, substrate, and population information
3. Plot Reference and Location Field Form

These field forms are designed to be 5” x 8” double-sided for use in a field tatem.
It is recommended they be copied onto rite-in-the-rain paper for field use.

____ PLOT Number	Crew	Date
____ Forest/Dist or District/Area	Plot size	Time
____ ELEV (ft)	Location	
___ ASPECT		
___ SLOPE (%)		
+ __ TOWNSHIP N		
__ RANGE __		
__ SECTION	UTM (easting)	
__ LANDFORM	UTM (northing)	
_ Topographic Moisture	Map	
_ Macroposition	Air Photo	
_ Microposition	Photo	
_ Microconfig V	Topography and Landform	
_ Microconfig H		
_ Successional Stage		
____ Year of Stand Origin		
____ Max Tree Age	Stand Structure and Succession	
__ CC Overstory		
__ CC Understory		
___ Avg Stand DBH (in)		
____ Series		
____ __ Plant Association		
__ Regolith		
____ Bedrock		
__ Lichen Line		
__ Total Ground Moss Cover		
Notes:		

TREES	Total %C	< 3 ft ht	< 4" dbh	4-12" dbh	12-39" dbh	> 39" dbh	DBH	Ht	Age	Rings

Shrubs	%C	Ph	V		Herbs	%C	Ph	V	

SURVEY and MANAGE / PROTECTION BUFFER CRYPTOGAM FIELD FORM

Plot Number	Plot Size	Crew	Date
Location			
Comments			

Species	Substrate	Substrate description	Size or Dbh	Cover or Abundance	Area	V	Notes

SURVEY and MANAGE CRYPTOGAM FIELD FORM (pg 2)

Ecology, Biology, Population Status of Survey and Manage/PB Cryptogams		
Plot Number	Crew	Date
ECOLOGICAL DISTRIBUTION OF TAXON, EXTENT OF THE POPULATION		
POPULATION STRUCTURE, VIGOR (reproduction, healthy, stressed, declining, diseased, browsed)		
THREATS TO POPULATION (apparent, perceived)		
ADDITIONAL COMMENTS		

APPENDIX C. Field Methods and Data Dictionary

Three field forms are included in Appendix B. Following is a description of fields and data to be collected during field surveys.

Plot Card for Site and Plant Community data

This card is used to record data on stand and plant community conditions to characterize the habitat and ecological conditions of the site where Protection Buffer bryophyte is observed.

PLOT NUMBER will be the first and last initial of the surveyor followed by 2 numbers that are sequential numbers for each survey form, *e.g*. Jane Doe, plot number 2 will be **JD02**. Each plot will have a unique number. This number will appear on all plot cards for the plot, on any voucher specimens collected, map and aerial photo locations, and photographs.

FOREST/DISTRICT (4 digit code) or **BLM District/Resource Area**

ELEVATION: in feet
ASPECT: in degrees 1-360
SLOPE: in percent

See data dictionary for codes to be used for landform, topographic moisture, macroposition, microposition, microconfiguration (vertical and horizontal), successional stage, regolith and bedrock

YEAR OF STAND ORIGIN: field will be completed in office using fire history layer if available
MAXIMUM TREE AGE: if a tree is cored on plot, choose oldest looking tree that will produce a good core to document maximum age of trees on plot

CC OVERSTORY: canopy cover of overstory, which is the percent cover of the overstory layer on the plot - values 0-99%.
CC UNDERSTORY: canopy cover of understory, which is the percent cover of the understory layer on the plot - values from 0-99%.

AVERAGE STAND DIAMETER: Estimate the average diameter of dominant trees on the plot.

SERIES: **Key out** the series using the appropriate Plant Association guide for the geographical area of the survey. Record acronym for series (1st two letters of genus and 1st two letters of species, *e.g.* Western Hemlock = TSHE)

PLANT ASSOCIATION: **Key out** the plant association using the appropriate Plant Association guide for the area.

LICHEN LINE: Record the lichen line as observed by the average height of lichens on the tree boles. This is an indication of the average annual snow depth for recent years in the stand. Generally the alectorioid lichens give the best indication of snow depth (*Alectoria* or *Bryoria* spp).

CREW: record names of crew taking plot data
TIME: time of day plot started and finished

PLOT SIZE: generally a 1/10 acre plot (37.24 ft radius) is adequate to characterize the stand. Consider that the plot size should be large enough to sample the patchiness and variability in the stand, although the plot should only encompass a homogeneous plant community.

LOCATION: provide detailed written description on the location of the plot, using enough detail that someone else could relocate it.

UTM: record UTM coordinates (easting and northing), and UTM zone
MAP: record quad map used for documenting plot location
AIR PHOTO: if aerial photograph used, record the photo number where plot is marked.
PHOTO: record photo numbers if photographs taken at plot.

TOPOGRAPHY AND LANDFORM: provide a description of the topography and landform of the plot.

STAND STRUCTURE AND SUCCESSION: Provide verbal description with **sufficient detail** to **provide an image of the stand structure and successional stage.** Record qualitative comments on overstory dominants, tree regeneration, canopy structure, snags and down wood, understory dominants, horizontal and vertical structure, successional stage, and any other observations of note or interest.

BACK SIDE OF PLOT CARD

Record scientific name of species on plot
Record percent cover of species on plot (range from 1 to 99%)
Top section for trees: record total % cover for species (<= 99%)
    (optional to record % cover for 5 different size classes) - if these cover values are not recorded, be sure to include in the stand structure description sufficient detail to describe the tree layer, size class distribution and relative abundance for the different tree species
If trees are aged or measured, record dbh, height, age, ring count
Bottom section for understory species; divided into 2 sections for shrubs and herbs; if not enough room for all species on plot, use another card.
Record % cover for species; check in column V if voucher collected
Ph = Phenology Codes (optional):
    B = bud; fl = immature flower; FL = mature flower; fr = immature fruit; FR = mature fruit; S = seed

DATA DICTIONARY FOR SURVEY AND MANAGE / PROTECTION BUFFER SPECIES - PLOT CARD

PLOT NUMBER: unique number for plot
FOREST/DISTRICT: standard numeric codes for Forest/District; BLM District/Resource Area

LANDFORM:

- 15 = glacial cirque
- 17 = glacial side slope
- 19 = glacial valley
- 41 = glacial moraine
- 35 = cliffs
- 60 = colluvial (talus, etc.)
- 61 = talus
- 62 = scree
- 70 = alluvium
- 71 = alluvial fan
- 73 = alluvial terrace
- 75 = alluvial valley
- 77 = mudflow
- 63 = colluvial fan
- 64 = colluvial/fluvial fan
- 81 = mountain slope

TOPOGRAPHIC MOISTURE (redistribution of water by gravity)

- 1 = extremely dry (rocky ridgetop)
- 2 = very dry
- 3 = dry, well-drained
- 4 = dry mesic
- 5 = mesic
- 6 = moist mesic
- 7 = moist, well-watered
- 8 = wet
- 9 = standing water

MACROPOSITION

- 1 = ridgetop
- 2 = upperslope
- 3 = midslope
- 4 = lower slope
- 5 = bottom
- 6 = plain

MICROPOSITION

- 1 = ridgetop
- 2 = upper 1/3
- 3 = mid 1/3
- 4 = lower 1/3
- 5 = bench, flat
- 6 = toe of slope
- 7 = river bottom
- 8 = edge of or in basin or wetland
- 9 = draw, intermittent stream bottom (V&H)

MICROCONFIGURATION (vertical and horizontal)

- 1 = convex
- 2 = straight
- 3 = concave
- 4 = undulating

SUCCESSIONAL STAGE

- 1 = CC, not burned
- 2 = Grass-forb (1-10 yrs after burning)
- 3 = shrub-seedling (1-10 yrs)
- 4 = sapling (5-150 yrs)
- 5 = young forest (16-50 yrs)
- 6 = mature forest (50-200 yrs)
- 7 = young old-growth (200-400 yrs)
- 8 = old old-growth (400-1000 yrs)
- 9 = climax, both composition and structure

REGOLITH (parent material)

- 11 = erosional colluvium
- 12 = neutral colluvium
- 13 = depositional colluvium
- 21 = alpine glacial
- 22 = continental glacial
- 23 = glacial-fluvial
- 30 = volcanic
- 31 = tephra
- 32 = pyroclastic
- 40 = residual
- 50 = organic
- 60 = talus
- 70 = alluvium
- 80 = lacustrine

BEDROCK

- 1020 = granite
- 2240 = andesite
- 2260 = basalt
- 2300 = pyroclastic
- 2220 = rhyolite
- 2370 = pumice
- 6770 = limestone
- 8000 = mixed
- 9999 = unknown
- 5640 = shale
- 5650 = sandstone
- 5670 = conglomerate
- 3420 = slate
- 3440 = schist
- 3460 = gneiss
- 4540 = serpentine
- 4550 = greenstone

Data Dictionary for Survey and Manage / Protection Buffer Cryptogam Field Form

Plot Number: unique number for plot
SPECIES: taxon name

SUBSTRATE: substrate class for taxon: bark, wood, rock, soil, litter

SUBSTRATE DESCRIPTION: type and quality of substrate: *e.g.*
SPECIES OF TREE if epiphyte,
tree LIVE, DEAD (<10 years, fine branches still present) or SNAG;
TYPE OF ROCK if on rock;
TYPE OF SOIL (mineral, organic, saturated);
DECAY CLASS OF LOG:

I =	recent down, fine branches still present, log elevated on support points
II =	bark still intact, small twigs absent, suspended above ground but with slight sag
III =	trace of bark, shape round, texture hard w/ large pieces, log sagging near ground
IV =	bark absent, shape round to oval, all of log on ground, texture soft
V =	well decomposed, shape oval, texture soft and powdery

SIZE OR DBH: size of substrate (e.g. large boulder, actual dimensions); dbh of tree

COVER OR ABUNDANCE: **if ground species, measure percent cover**
if epiphyte, use abundance ratings 1-5;

ABUNDANCE RATING SYSTEM
1 = RARE, usually 1 or 2 seen, generally < 0.5% cover
2 = UNCOMMON; several seen but not conspicuous; generally 1-10 % cover
3 = COMMON; easily seen but not abundant; generally 10-25% cover
4 = VERY COMMON; easily seen and conspicuous, too many individuals to count; generally 25-50% cover
5 = ABUNDANT; abundant and very conspicuous; generally > 50% cover

AREA: actual square footage of area covered by taxon

V = check if voucher specimen collected

NOTES: space for other comments not incorporated under other fields

BACK SIDE OF S&M CRYPTOGAM FIELD FORM

Use back of card to record comments and observations in more detail:
specifics on ecological distribution of taxon in stand, extent of population
population structure, reproductive individuals present
population vigor
population threats

Plot Reference / Location and GPS Data / Population Reference Field Form

This field form needs to be completed with sufficient detail and accurary so that Protection Buffer bryophyte populations can be relocated efficiently.

Forest-RD/loc or District-Area/loc are the USFS Region, Forest and Ranger district, or the BLM District and Resource Area, plus a description of the location. Record UTM coordinates.

Referencing Plot Location with Plot Reference Point (PR)

This section is for establishing a plot reference point along a road or trail, or conspicuous landmark. This reference point is the key to relocating the plot.

Provide detailed mileage and road information: *e.g*. take Road 65 six miles N from town, then take Road 6520 2.3 miles east from junction with Road 65 to pullout just into the old-growth.

Location of Plot Reference: *e.g*. Douglas-fir tree on north side of road, 15 ft off road up the cutbank.

Plot Reference (PR) tree: provide tag number, dbh, species and any other distinguishing information for the plot reference tree. It may be that some other structure than a tree is used, such as a stump or large boulder. The Plot Reference point should be a permanent feature if possible.

Provide accurate slope-corrected (horizontal) distance and azimuth from the plot reference point to the plot center.

Referencing Plot Center with Reference Points (RP)

This data will allow precise relocation of the plot center. It is recommended that a cedar or plastic stake be put in the ground at plot center.

Reference trees should be tagged with numbered metal tag, and species and dbh recorded. Measure the distance (nearest 0.1 ft) from the tree tag to the plot center where the stake goes into the ground. Record the azimuth from the tree tag to the plot center.

Referencing Population to Plot Center

Record the species of the population. Measure the distance (nearest 0.1 ft) from the population center to plot center. Record the azimuth from the plot center to the species population.

Plot Reference / Location

Plot no._____ **Crew** _____ **Date** _____

Forest-RD/loc _____

District-Area/loc _____

Referencing Plot Location with Plot Reference Point (PR)

Take Road to Plot Reference (PR) pt._____

Location of Plot Reference (PR) pt. is_____

PR tree: Tag no:_____ DBH_____ Species_____

other info on PR tree_____

From PR to Plot Center (PC) _____ft at _____deg.

Referencing Plot Center with Reference Points (RP)

RP # 1 Tree No. _____ species_____

From tree tag to PC _____ft at _____deg

RP # 2 Tree No. _____ species_____

From tree tag to PC _____ft at _____deg

RP # 3 Tree No. _____ species_____

From tree tag to PC _____ft at _____ deg

GPS Data / Population Reference

Plot no._____ **Crew** _____ **Date** _____

UTM Zone _____

	UTM E	**UTM N**
Plot Ref. tree	E	N
Plot Center	E	N
Population	E	N

Referencing Population to Plot Center

Population #1: species _____

From Plot Center _____ft at _____deg.

Population #2: species _____

From Plot Center _____ft at _____deg.

Population #3: species _____

From Plot Center _____ft at _____deg.

Notes:

APPENDIX D. CRYPTOGAM PACKET FORM FOR VOUCHER SPECIMENS

FOLDING INSTRUCTIONS:

1. flip packet pattern over so folds are made from the unprinted side
2. fold down top 1/3 (section without printing)
3. fold in side panels
4. fold down top panel with label information

CRYPTOGAMS

of the

Species _____ **Date** _____

Substrate _____ **Plot No.** _____

Location _____

PA / Habitat _____

Collector _____ **Collection No.** _____

County _____ **State** _____