



Procedures for Vegetation and Fuels Data Collection at Lassen Volcanic National Park

2006 Vegetation and Fuels Mapping



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Geographic Resource Solutions

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Overview of Data Collection Effort

The field sampling is performed using a point-transect method to develop descriptions of the different layers of the land-cover types being sampled at Lassen Volcanic National Park (LAVO). Transects are located away from training site/polygon boundaries. The typical transects are shaped in the form of a figure eight, comprised of 100 points, and are used when the training site polygons are large enough. When training sites are smaller or narrower, a triangle shape or linear transect comprised of 20 to 50 points should be used. In some cases, points are placed closer together to accommodate sampling of smaller areas or different vegetation types. Tree types typically have the widest spacing, up to 15 feet between points, whereas herbaceous types may have the closest spacing with points placed 3 feet apart. Points at the corners of the triangle(s) are not measured, as well as some interior points, resulting in an even number of 100 or 50 points per sample (these numbers are not divisible by three). If a field site cannot be reached, all attempts to gain a view of the site should be made, and an ocular estimate that totals 100% cover should be recorded. Understory cover estimates, as well as surface indicators, should also be recorded, if possible.

Transect data should be recorded in accordance with the definitions included in the Field Data Collection Manual. Landscape features should be identified and recorded at the location of each Sample Site. Such features include average slope, aspect, elevation, hydrologic regime, soil type, parent material, and any other modifiers used to describe the site. Transect data includes species and feature designations present at the different points established along the transect. The “layer” of all point features should be noted by field crews. The genus and species of vegetation should be recorded, if known, along with size characteristics for trees and shrubs. Non-tree features should be recorded, as well as significant indicator species, features, and ground surface conditions. Unknown plant species should be sampled and collected (site number and unknown number) for later identification. All plant species collected should remain in the park at all times.

Field crews should use GPS receivers to ascertain that they are in the right “target” area and to record the location of field data collection sites. In some instances, terrain or forest cover may preclude the use of the GPS units. In this case, field crew members should use reference points and offsets, as necessary. Starting and ending points, as well as corner points of transects, should be recorded with the GPS units, to the extent that these data are available. If these locations are not available, then a transect reference point indicating distance and bearing to the start of the transect should be established with the GPS. GPS units should be left on, even when reception is not suitable. In addition, GPS units should be carried throughout the transect.

Field crews should be made up of three teams, consisting of two people each. Each crew consists of a botanical specialist and a field data collection specialist. The botanical specialist’s responsibilities include the identification of a wide variety of plants in the field, the collection of unknown species to be identified at a later time, assisting with navigation to and from Sample Sites, data recording, and the operation of the GPS units. The field data collection specialist is responsible for all equipment and its operation, as well as the accurate location of field data collection Sample Sites. This position also assists in the collection of botanical data.

Crews should be under the supervision of a crew leader. Crew leader responsibilities include: organization of daily activities; providing crews with maps, photos, and equipment for the surveys to be performed; recording data; navigation to and from Sample Sites; and organizing equipment and the data at the end of the day. It is also the crew leader’s responsibility to save track logs and download GPS and camera data at the end of the day or week.

Collecting and Recording Field Data

Be sure to ask questions of your crew leader, supervisor, or Project Manager if circumstances arise of which you are unsure. Questions should be answered and discussed with all field crew so that everyone is recording information consistently.

Although the primary goal of this effort is the collection of information at the Sample Site locations, field crew members should also be observant of other information. Pay attention to types while you are traveling between plots. If you see a large type that you have identified as a rare or important type, it is OK to opportunistically sample the area, providing it is suitable for sampling (large enough and homogeneously distributed). Fill out all Sample Site information completely for these types of Sample Sites. Document the location of the site, record the transect angles and interval you use, and record all other data as if it were a planned site.

When taking notes while traveling between plots, use the Crew Diary notebook. **Do not put these types of notes on the plot card from a previous site or on the schedule.** Record the date, GPS point(s), picture number(s), and a description of the type. Notes can also be taken when you notice a change in types. For example, a transition between *Abies magnifica* and *Abies concolor* should be noted.

There are several different types of data that should be collected at each Sample Site. These data types include:

1. Sample Site information
2. Transect sample point information
3. Woody debris (Fire Monitoring Protocol) information
4. Other common point characteristics
5. Trace species
6. Extracurricular information specific to this project

Data definitions and specifications should be organized by the different types of data listed above.

Land-cover Sample Site Header Field Data Descriptions

All Sample Site information should be filled in on the first page of the plot data card(s). This includes all GPS point and picture numbers. Fill in Trsite_ID, page number, and date on following pages.

Trsite ID – The unique ID number of the Sample Site (MMDDXX) for which land-cover attributes are estimated using line point-transect sampling or other estimation procedures. This value is assigned using consecutive numbers that reflect the sample month, day, and sample number. This should be filled in on all pages.

Iso Class – The iso data class number of the sample area in the candidate training site database.

Target GPS ID – The value of the GPS waypoint used to identify and locate the sample area.

GPS Point(s) – The waypoint numbers of points captured on the GPS unit that represent the corners of the Sample Site.

Photo ID(s) – The ID(s) of photos taken to represent the Sample Site; at least two photos should be taken per site from the starting corner point-one looking down the initial transect line and the other looking down the final transect line.

Slope % – The estimated percent slope of the Sample Site.

Aspect – The estimated aspect (in terms of azimuth) of the Sample Site.

Elevation – The estimated elevation of the Sample Site based on the GPS or from the Weekly Schedule.

TrAzimuths – The azimuths of the sample transects in the order that they are established from the starting point location identified by the Target GPS ID. The first azimuth **MUST** represent the azimuth of the first portion of the transect measured that represents the top or bottom of the “flattened” figure eight configuration.

TrStart – The location/corner of the starting point of the first transect with respect to the field sample transect pattern to be implemented (N, NE, E, SE, S, SW, W, or NW).

TrInterval – The interval or spacing of points along the transect (12, 9, 6, or 3).

Hydrologic Regime – (circle) the value that represents the general moisture characteristics of the site.

Modifier – (circle) the value that represents the general physiographic location of the Sample Site.

HTLC – The estimated average height (in feet) to the base of the live crown of the canopy of the predominant tree component of the sample area.

LC Calls – Estimated general categorical estimates of type, size, and density that describe the sample area.

Date – The date recorded as YY/MM/DD. This should be filled in on all pages.

Page – The page numbered consecutively from one to the total number of pages in the order the data were collected. A point may be continued onto a new page. Always fill in the page number on all plot cards.

Land-Cover Transect Point Data Field Descriptions

When collecting data at a sample point, observe and record data from the top layer down (Layers 1–5).

Vegetation Community and Structure Information

Data should be recorded in the order of the points as they are visited. When collected, trace species should be recorded after/as part of each point where they are believed to have been sighted. Traces should be reviewed at the end of the transect (see discussion below about collecting trace species information).

Point # – The sample point along the transect beginning with the number one. Transects may have any number of points, but the typical sample point size should be between 50 to 100 points; a 50-point sample makes a triangle, and a 100-point sample makes a figure eight. Multiple sightings/recordings can occur at any given sample point. *If ocular estimates are made for the site, specify point # = 0 for all lines used to describe the vegetation and land-cover components, layer by layer, for the site.*

LC Code – The genus-species code, or code of the non-veg cover characteristic present at the sample point. This may be the 6-character alphanumeric string that represents the first three characters of the genus and species, or an alphanumeric code to represent non-vegetative features. Values may also be used to represent unknown species while the site is sampled. **Each unknown should be identified and numbered uniquely and consistently while visiting a particular site.** Unknowns should not be numbered to represent multiple Sample Sites. Please see the section about collecting and recording unknown species for a more detailed description. Other codes are used to represent non-vegetation land-cover features.

Size – the DBH (diameter breast height: diameter of tree species at 4.5 ft above the ground [uphill side]) of a tree. The field is also used to record the size designation of the fine woody debris classes, based on the number of hours (1, 10, or 100), as well as the Decay Class of a coarse woody debris sample. All other LC Code values have a size of blank or zero in this field.

CD Freq – The (average) crown diameter of the tree covering that point. For odd-shaped crowns, determine the average diameter using multiple measurements. When the species field is used to code other point attributes, this field may be used to store other condition measurements. This field is also used to indicate a dead characteristic. Enter the value as a negative number (-) to indicate the vegetation is dead. For a shrub/herbaceous species enter

“-1,” otherwise enter the negative crown diameter of a tree. All other LC Code values have a size of blank or zero in this field. Do not record crown diameter as a fraction. If the crown is less than 1 ft, just enter one. It is possible to record both live and dead plants of the same species at the same point. The field is also used to store fine woody debris (FWD) and coarse woody debris (CWD) frequency values during the FWD/CWD sample transects.

Layer – the canopy position of the sampled characteristic. The position also relates to the bird's-eye-view of the vegetation in the land-cover type. Options are as follows:

1. **Overstory Canopy Layer** (trees only) – This layer is the top (dominant) tree layer in the land-cover type. It is the layer that is "seen" in the perspective of a "bird's eye view," such as from a satellite or airplane.
2. **Subordinate Canopy Layer** (trees only) – This layer is overtopped by trees in the overstory layer; by definition, there has to be a tree in the overstory layer to have a tree in Layer 2.
3. **Near Ground-Intermediate Shrub, Pole, and Sapling Layer** – This is the near ground layer, typically defined by species that are 30 feet or less in height. It may also consist of poles, saplings, and seedlings, as well as suppressed shrub-sized tree species. It may be the top layer recorded at a point if Overstory (1) layer size tree species are not present on the point. *If two or more near ground types of cover are present at a point and one "overtops" the other(s), record the highest layer of vegetation as Layer 3 and the understory species using a -3 for the Layer code value* (The "-" sign is used to differentiate these species in this situation).
4. **Ground-level Vegetation Layer** – This layer is below a shrub height and consists of ground vegetation typically consisting of forbs, grasses, small shrubs, and dwarf species. This may be the top layer if Overstory (1) or Near Ground (3) tree and shrub species are not present at the point. Record grasses, lichens, moss, and all other plants living "on the ground" using Layer 4.
5. **Surface Condition Layer** – Non-vegetative elements such as water, gravel, and bare-soil, but also signifies dead vegetation attributes such as snags, forest floor fuels, and woody debris. This may be the top layer if tree, shrub, and ground cover species are not present at the point.
6. **Fine Woody Debris Layer** – This layer value is used to represent data collected during the FWD sampling efforts.
7. **Coarse Woody Debris Layer** – This layer value is used to represent data collected during the CWD sampling efforts.
8. **Fuel Bed/Litter Profile Data Layer** – This layer indicates that the data represent the fuel bed profiles taken on the transects.
9. **Trace Component Layer** – This layer indicates a land-cover species or feature that the crew identifies as present at the site, but which was not recorded at any point during the sampling process. It may be used to identify indicator or invasive species, or other significant characteristics.

Collecting Unknown Plant Species

- Use consistent naming conventions for unknowns. If the genus is known, use the first three letters of the genus name followed by *U_1*, *U_2*, *U_3*, etc. For example, an aster would be recorded as *AstU_1* or *AstU_2*, etc. If the genus is not known, use the more general herbaceous code, *HerU_1*, *HerU_2*, etc. These should be recorded on the plot card as they are shown here.
- If there is more than one genus with the same first three letters, such as *Ericameria* or *Eriogonum*, use the first four letters and leave out the underscore. For example, *EricU1* or *ErioU1*.
- If the genus is not a very common one, it is a good idea to make a note on the back of the plot card indicating the full genus name.
- Unknowns should be listed on the back of the plot card on the first page if there is adequate room, or in the Crew Diary. Notes about each unknown can be listed. Be sure to leave enough room for the species name to be written next to the unknown designation.

- If there is an unknown on a point, but it cannot be identified because of the poor condition of the specimen, do not use the unknown naming convention. Simply record the first three letters of the genus followed by *sp* for species. For example, a dried up penstemon with no flowers would be recorded as *Pen_sp*. Do not collect this as an unknown specimen unless the genus is uncertain.
- Do not reuse bags. Do not throw bags away. When a bag can no longer be used, give it to the field crew leader who will store it in an appropriate container or file.
- When the unknowns have been identified to genus and species, the plot card data should be updated.
- The unknown names should have previously been listed on the back of the plot card or in the Crew Diary. The full genus and species name of the keyed-out unknown should be listed after the unknown name. If the sample could only be identified to genus, the full genus name followed by *_sp* should be listed after the unknown.
- As unknowns are identified, the name of the plant should be recorded on the specimen's zip lock bag. Then the Sample Site number, point number (if applicable), unknown name, and the genus and species names should be recorded in the Unknown Log spreadsheet if computer access is available, or in the Unknown Log sheet in the project file cabinet.

Woody Debris (Fire Monitoring Protocol) Information

Fine Woody Debris (FWD)

FWD includes downed, dead branches, twigs, and small tree or shrub boles that are severed from their original source of growth. FWD can be connected to a larger branch as long as this branch is on the ground and not connected to a standing dead or live tree. Only the woody branches, twigs, and fragments that intersect the transect are counted. FWD can be connected to a down, dead tree bole or down, dead shrub. FWD can be shrub twigs as long as the shrub is a woody species. FWD should be no higher than 6 feet above the ground to be counted.

FWD does **not** include:

- Woody pieces ≥ 3.0 inches in diameter at the point of intersection with the transect.
- Dead branches connected to a live tree or shrub, or to a snag or dead shrub.
- Dead foliage (i.e., pine or fir needles, or leaf petioles) or cone fragments.
- Bark fragments or other non-woody pieces that are not an integral part of a branch, twig, or small bole.
- Small pieces of decomposed wood (i.e., chunks of cubical rot).

Tally by debris size class within the specified distances. Terminate any sampling for a particular FWD size when the frequency reaches 25.

LC Code: FWD

Size: Enter a code based on what is defined in [Table 1](#).

CD Freq: Tally/count of size class

Layer: 6

Coarse Woody Debris (CWD)

Coarse dead woody material that is on the ground or fallen trees ≥ 3.0 inches in diameter, which is less than 45 degrees from horizontal, and is at least 3 feet in length. CWD should be within a 60 foot long sub-transect within a plane up to 6 feet high. CWD includes downed, dead tree and shrub boles, large limbs, and other woody pieces

Table 1. Fine woody debris (FWD) size class categories for use in mapping vegetation and fire fuels at Lassen Volcanic National Park.

Code	Definition
0	No FWD Present
1	0.01 to 0.25 inches (1-hour) measured within a 6-foot length sub-transect
10	0.26 to 1.00 inches (10-hour) measured within a 6-foot length sub-transect
100	1.01 to 3.00 inches (100-hour) measured within a 15-foot length sub-transect

that are severed from their original source of growth and on the ground. CWD also includes standing dead trees (either self-supported by roots, severed from roots, or uprooted) that are leaning > 45 degrees from vertical. Measure pieces ≥ 3.0 inches where they intersect the point (USFS, FIA, 2002).

LC Code: CWD

Size: Enter appropriate Decay Class Code from [Table 2](#). Do not leave it blank if there is no CWD. Indicate CWD with an entry of zero.

CD Freq: Frequency

Layer: 7

Table 2. Coarse Woody Debris (CWD) Decay Class Definitions for use in mapping vegetation and fire fuels at Lassen Volcanic National Park.

Decay Class	Structural Integrity	Texture Of Rotten Portions	Color Of Wood	Invading Roots	Branches And Twigs
0	CWD Absent	--	--	--	--
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Throughout	Branch stubs pull out
5	None; piece no longer maintains its shape and spreads out on ground	Soft; powdery when dry	Red brown to dark brown	Throughout	Branch stubs and pitch pockets have usually rotted down

Litter Profile

Litter is the layer of freshly fallen leaves, needles, twigs (< ¼ inch in diameter), cones, detached bark chunks, dead moss, dead lichens, detached small chunks of rotted wood, dead herbaceous stems, and flower parts (detached and not upright). Litter is the loose plant material found on the top surface of the forest floor. Little decomposition has begun in this layer (USFS, FIA, 2002).

Measure the depth of the litter layer from surface of duff to top of soil layer. The fuel bed is the accumulated mass of dead, woody material on the surface of the forest floor. It begins at the top of the soil layer, and includes litter, FWD, CWD, and dead woody shrubs. In this definition, the litter profile does not include dead hanging branches from standing trees. Measure the depth in (0.1) inches and percent composition (10%). If the profile point falls on rock, enter 0.0. Do not leave this field blank. If there is no entry for the profile, it should be assumed that it was not taken.

LC Code: PRO

DBH: Depth to soil to nearest 0.1 inch

CD Freq: Percent Litter/fuel to nearest 10%

Layer: 8

Recording Other Common Point Characteristics

Snags

Snags are dead standing trees species that are included in the sample ([Table 3](#)). Leaning snags may be between 45 degrees and standing (90 degrees) from the horizontal. Snags less than 45 degrees or supported by other trees or structures are considered to be CWD.

In general, indicate trees that have died as snags by adding a dash (-) in front of the **CD Freq** value for the tree. Each snag should be assigned a Decay Class. Only recently dead trees are recorded as Decay Class 1. Snags should be entered as a **Layer** (1–3), and the Decay Class stage (1–5) should be appended to the Layer value (see Note below).

Note: Record the snag as you would record a dead tree of a specific species but combine the Decay Class and the **Layer** value. For example, a snag in Layer 2 of Decay Class 1 would be coded as Layer "21." A snag in Layer 1 of Decay Class 3 would be coded as Layer "13."

Duff

Duff is the layer just below the litter, comprised of decomposing vegetative material from the base of the litter down to mineral soil. You should see NO recognizable plant parts; the duff layer is usually dark, decomposed organic matter. When moss is present, the top of the duff layer is just below the green portion of the moss. The bottom of this layer is the point where mineral soil (A horizon) begins (USFS, FIA, 2002).

Record the depth in inches.

LC Code: DUFF

Size: Not Used

CD Freq: Not Used

Layer: 5

Table 3. Definition of snags (dead standing trees) for use in mapping vegetation and fire fuels at Lassen Volcanic National Park.

Decay Class stage (code)	Limbs and branches	Top	Percent bark remaining	Sapwood presence and condition	Heartwood condition
1	All present	Pointed	100	Intact; sound, incipient decay, hard, original color	Sound, hard, original color
2	Few limbs, no fine branches	May be broken	Variable	Sloughing; advanced decay, fibrous, firm to soft, light brown	Sound at base, incipient decay in outer edge of upper bole, hard, light to reddish brown
3	Limb stubs only	Broken	Variable	Sloughing; fibrous, soft, light to reddish brown	Incipient decay at base, advanced decay throughout upper bole, fibrous, hard to firm, reddish brown
4	Few or no stubs	Broken	Variable	Sloughing; cubical, soft, reddish to dark brown	Advanced decay at base, sloughing from upper bole, fibrous to cubical, soft, dark reddish brown
5	None	Broken	Less than 20	Gone	Sloughing, cubical, soft, dark brown, OR fibrous, very soft, dark reddish brown, encased in hardened shell

Barren

Barren surfaces are inorganic non-water surfaces. A number of different barren sites are recognized at point locations. Record the appropriate code (x) for the specific type of barren site found at the point, if possible.

LC Code: BARx

Size: Not Used

CD Freq: Not Used

Layer: 5

Water

Standing water is a surface characteristic that is recorded. The actual water code depends on the type of water, as there are codes for clear water, silty water, “organic” water, and so forth, as indicated by the value of (x). Record the appropriate code for the type of water present at the point.

LC Code: H2Ox

Size: Not Used

CD Freq: Not Used

Layer: 5

Trace Species

Trace species are species that do not fall on a point but are in the plot area. Two sets of trace species should be identified during sampling efforts. One set of trace species should be collected in an approximately 1,000 m² area observed along the first leg of the sample transect. This “relevé”-like area is defined as an area of 8 m on either side of the sample transect between Point 1 and Point 18 when the spacing is a 12-foot interval. When the spacing interval is less than 12 feet, a smaller area should be surveyed for trace species at 8 m on either side of the transect line between Points 1 and 18. All trace species within this area should be recorded as occurring at Point 18. The second area in which trace species should be surveyed is within the immediate area of the Sample Site. If plants are noted within the Sample Site that do not fall on a point, they should be recorded as a trace species. This should include plant species found within the immediate area of the Sample Site. Record these trace species as occurring at the last point of the transect.

If a plant species is observed that is an unknown genus and species, it should be noted as an unknown, collected, and described in the unknown plant species collection section.

Point#: Either Point 18 or same as the last point on survey

LC Code: Species code

Layer: 9

Extracurricular Elements

Collect GPS waypoints at locations at which any LAVO invasive plants are identified. LAVO invasives include:

- *Bromus tectorum*
- *Centaurea solstitialis*
- *Cirsium arvense*
- *Cirsium vulgare*
- *Cytisus scoparius*
- *Hypericum perforatum*
- *Leucanthemum vulgare*
- *Rubus armenaicus*
- *Verbascum thapsus*

Field Sample Site Work Plan

1. Identify “best” access (“take-off” location) to the sample location using maps and photos. Go to that location.
2. Leave the GPS on while traveling to the location.
3. Determine bearing and distance to the site from the “take-off” location.
4. Record a GPS waypoint (as a reference) for the last known GPS location that can be used to locate the site. Record the distance and bearing from that point (notes).
5. Locate the Sample Site and confirm the location, as best as possible.
6. Determine if the site should be sampled (has it changed [e.g., burn] since imagery? Has it been harvested?). Record Transect Sample Site header information ([Figure 1](#)). Describe in notes if the site is rejected ([Figure 2](#)).
7. Locate the initial sample point location, collect a GPS point, and establish the first and second photo point(s). Fill in the Transect Header Information on the field form ([Figure 1](#)). Carry the GPS while surveying and take points at all corners when reception is possible.
8. Establish the initial portion of the transect using the transect rope at the proper bearing, as indicated in the Sample Work Plan/Schedule. Be careful not to disturb the Sample Site (FWD and CWD) in the area to be sampled.
9. Record point data at the proper intervals as indicated in the Sample Work Plan/Schedule ([Figure 1](#)).
 - a. LC Code
 - b. Size
 - c. CD Freq
 - d. Layer
10. Starting at the first recorded point, begin the FWD and CWD sub-transect samples.
 - a. FWD < 1.0” on next 6 feet from the 12’ point on bearing.
 - b. FWD ≥ 1.0” on next 15 feet from the 12’ point on bearing.
 - c. CWD on next 60 feet from the 12’ point on bearing.
 - d. PRO (litter sample) at 12’ point on bearing and 72’ point on bearing.
11. Proceed down the transect, moving the transect rope as necessary. Record transect point data to the end of the bearing line. We skip certain points so that our total number of points adds up to 100.
 - a. Points 1–18: skip corner points
 - b. 19–34: skip first interior, last interior, and center point
 - c. 35–50: skip first interior and last interior
 - d. 51–68: skip corner points
 - e. 69–84: skip first interior and last interior
 - f. 85–100: skip first interior and last interior
12. Establish the last point of each transect line (location where transect turns).
13. Repeat steps 9–12 for the subsequent transect lines until sample is complete. You should return to the initial point of the transect. Record offset in notes.
14. Record site notes on the back of the first card as appropriate. A transect diagram is located on the back of the plot card ([Figure 2](#)).

- a. Label the diagram to show its orientation with respect to North, as well as the starting point of the transect.
- b. Make any other notes as necessary to identify and describe observations or locations along the transect that may be helpful in understanding the location sampled (e.g., inclusions and stream crossings), or if you think something may be of particular interest. Also, note if you think the type has changed while surveying, or if there are different types near the edges of the transect area.

TRSite_id: _____ Page: ____ of ____
 IsoClass: _____ Crew: SH LL SK KB CS KS _____ Date: ____ / ____ / 2006
 Target_GPS_ID: _____ GPS Pnt(s): _____ PhotoID(s): _____
 Slope: _____ % Aspect: _____ Elevation: _____ ft TrAzimuths: _____-_____-_____-_____
 Hydrologic Regime: Dry Mesic Wet Aquatic TRStart: N NE E SE S SW W NW TRInt: _____ ft
 Modifier: Alpine Subalpine Boreal Upland Lowland Riparian Meadow HTLC: _____ ft
 LC Calls Type: _____ TreeSize: _____ Density: _____

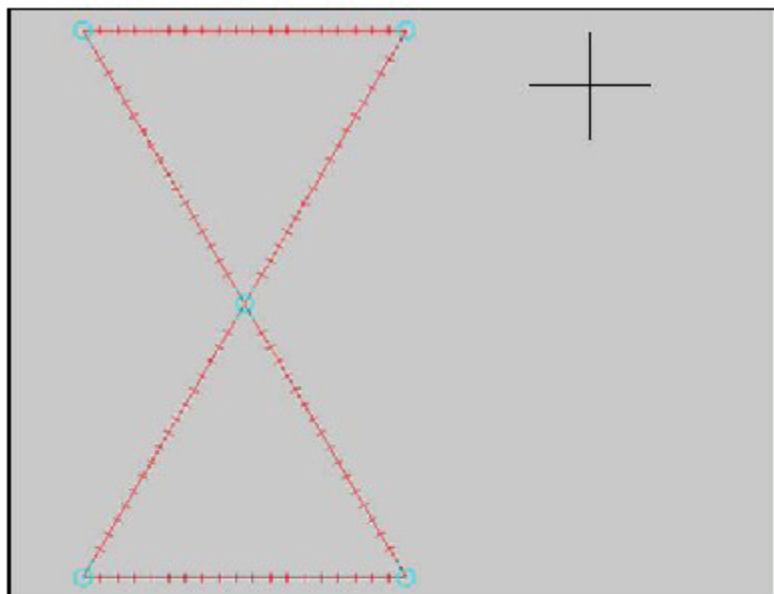
[illegible]

Figure 1. Example of the front page of the transect plot card.

LAVO Land Cover Transect Form(3)

Crew: SH LL SK KB CS KS ____

Date: / / 2008

**TRSite/Species Notes:**

GRS LAVO lcsurvey fieldform v1.4

Figure 2. Example of the figure eight plot diagram with 100 points (a 50-point sample would be half [top or bottom] of this-triangle).

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

National Park Service
U.S. Department of the Interior



Natural Resource Stewardship and Science

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