

3.000 PLOT DATA

Plot data are recorded from the center of subplot 1. In general, they apply to the entire plot.

3.100 STATE -- Record the unique FIPS (Federal Information Processing Standard) code identifying the state where the plot center is located.

When collected: All plots
Field width: 2 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: See Appendix 1

3.110 UNIT -- Record the unique code that identifies the inventory unit where the plot center is located.

When collected: All plots
Field width: 1 digit
Tolerance: No errors
MQO: At least 99% of the time
Values: See Appendix 1

3.120 COUNTY -- Record the unique FIPS (Federal Information Processing Standard) code identifying the county where the plot center is located.

When collected: All plots
Field width: 3 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: See Appendix 1

3.130 PLOT NUMBER -- Record the four-digit number that permanently identifies each field plot. Plot numbers are unique within a county. **Do not ever change a plot number.** Bring any suspected errors to the attention of your supervisor.

When collected: All plots
Field width: 4 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: 0001 to 9999

3.140 SAMPLE KIND – Record the code that describes the kind of plot being established.

Even though one plot design is established at all sample locations, there are important differences between plots because some plots are being established at sample locations that were used previously in the periodic inventory.

A diagram of the current plot appears on page 24. It consists of four fixed-radius subplots spaced 120 ft apart. Each subplot has a 24 ft radius. When this plot is being established by itself for the first time it is coded as a Sample Kind 1.

When a plot is being established over an older plot that was used in a periodic inventory, the Sample Kind will be **5, 6, 7 or 8**. In most cases these older plots will be 1/5-acre fixed radius plots, 1/5-acre fixed radius plots with variable radius subplots, or variable radius plots. When these plots are remeasured, the plot center of subplot 1 will be established over the plot center of the older periodic inventory plot. Examine all trees, greater than 5.0 inches DBH, that are within the circumference of the subplot 1 for a full set of variables, depending on their size and condition.

When collected: All plots

Field width: 1 digit

Tolerance: No errors

MQO: At least 99% of the time

Values:

- 1** Initial plot establishment
- 5** Remeasurement of an NEFIA or FHM plot – remeasurement of a previously established 4-point fixed radius plot.
- 6** Remeasurement of an NEFIA plot – remeasurement of a previously established fixed radius plot that was new at the previous occasion
- 7** Remeasurement of an NEFIA plot – remeasurement of a previously established fixed radius plot that was remeasured at the previous occasion
- 8** Remeasurement of an NEFIA plot – remeasurement of a previously established variable radius plot (i.e., 10-point plot) that was remeasured at the previous occasion

3.145 QA STATUS -- Record the code to indicate the type of plot data collected. A plot installed by a standard field crew will be coded as a standard production plot. Cold, blind and hot checks are part of the Quality Control / Quality Assurance (QC/QA) Program. (See Appendix 8)

When collected: All plots

Field width: 1 digit

Tolerance: No errors

MQO: At least 99% of the time

Values:

- 1 Standard production plot
- 2 Cold check plot (partial remeasurement by field supervisor or QA crew member)
- 3 Reference plot (off grid)
- 4 Training/practice plot (off grid)
- 5 Botched plot file (disregard during data processing)
- 6 Blind check plot (complete remeasurement by a QA crew)
- 7 Hot check/standard production plot (standard field crew and field supervisor or QA crew member)

3.150 CREW TYPE -- Record the code to specify what type of crew is measuring the plot.

When collected: All plots

Field width: 1 digit

Tolerance: No errors

MQO: At least 99% of the time

Values:

- 1 Standard field crew
- 2 QA crew (any QA crew member present collecting data)

3.155 PHASE -- Record the code that indicates the phase of the sample plot.

When collected: All plots

Field width: 1 digit

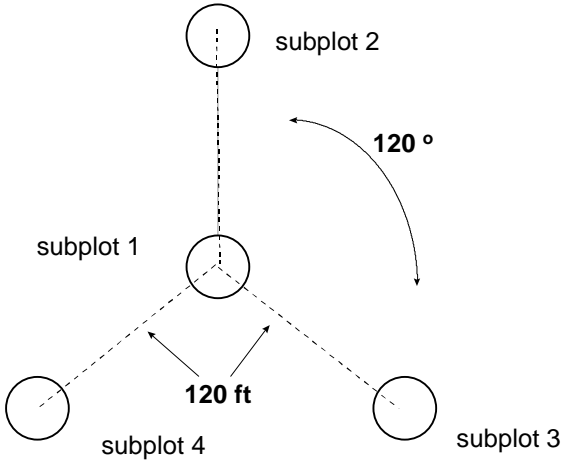
Tolerance: No errors

MQO: At least 99% of the time

Values:

- 2 Phase 2 (FIA only) plot
- 3 Phase 3 (FIA and FHM) plot

FIA Field Plot Design



Under normal conditions, chain to PC (center of subplot 1) first, and then chain to subplots 2 through 4 directly from subplot 1. The 120.0 ft traverse from subplot 1 to subplots 2 through 4 has a tolerance of ± 7.0 ft from subplot center to subplot center. (The 12.0 ft traverse at 90° from subplot center to microplot center has a tolerance of ± 1.0 ft.)

Sometimes, however, it will be necessary to chain directly from subplot to subplot. Chaining directly between subplots is not as accurate and should only be done when absolutely necessary.

<u>From Point</u>	<u>To Point</u>	<u>Azimuth</u>	<u>Distance</u>
2	3	150°	207.8 ft
3	2	330°	207.8 ft
3	4	270°	207.8 ft
4	3	090°	207.8 ft
4	2	030°	207.8 ft
2	4	210°	207.8 ft

3.160 MONTH -- Record the two-digit code for the month that the plot visit was completed.

When collected: All plots
Field width: 2 digits
Tolerance: No errors
MQO: At least 99% of the time
Values:

January	01	July	07
February	02	August	08
March	03	September	09
April	04	October	10
May	05	November	11
June	06	December	12

3.170 DAY -- Record the day of the month that the plot visit was completed.

When collected: All plots
Field width: 2 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: 01 to 31

3.180 YEAR -- Record the year that the plot visit was completed.

When collected: All plots
Field width: 4 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: Beginning with 1998, constant for a given year

3.190 PREVIOUS LAND USE -- Transfer this information from the old tally sheets. The codes **used during the previous inventory** are listed below:

When collected: All plots that are being remeasured
Field width: 2 digits
Tolerance: No errors
MQO: At least 99% of the time
Values:

Forest Land

20	timberland
22	urban timberland
40	unproductive forestland
41	unproductive reserved forestland

- 50 productive reserved forestland
- 51 Christmas tree plantation
- 52 urban forestland

Nonforest Land

Without trees

with trees

- | | | |
|----|-----|--|
| 61 | 62 | cropland |
| 63 | 64 | improved pasture |
| 65 | 66 | idle farmland |
| 67 | 68 | other farm land |
| 69 | --- | bog |
| 70 | --- | marsh |
| 71 | --- | salt marsh |
| 72 | --- | swamp |
| 73 | 74 | maintained rights-of-way,
regardless of width |
| 75 | 76 | mining and wasteland |
| 77 | 78 | developed recreation area |
| 79 | 80 | industrial and commercial land |
| 81 | 82 | tract and/or multiple family housing |
| 83 | 84 | single-family custom housing |
| 85 | 86 | other (specify in general notes) |

Water

- 91 census water
- 92 noncensus water

3.200 PREVIOUS MONTH -- Transfer this information from the old tally sheet.

When collected: All plots that are being remeasured
 Field width: 2 digits
 Tolerance: No errors
 MQO: At least 99% of the time
 Values: 01 to 12

3.210 PREVIOUS YEAR -- Transfer this information from the old tally sheet.

When collected: All plots that are being remeasured
 Field width: 4 digits
 Tolerance: No errors
 MQO: At least 99% of the time
 Values: 1988 to 1997

3.220 CRUISER -- Enter the three-digit numeric code of the person that cruised the plot.

When collected: All plots
Field width: 3 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: As assigned

3.230 TALLY -- Enter the three-digit numeric code of the person that tallied the plot.

When collected: All plots
Field width: 3 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: As assigned

3.240 TRAILS OR ROADS -- Record the nearest trail or road to the plot. Use the plot photo, maps, or reasonable observations made while traveling to the plot to determine nearest trail or road (within 1 mile straight-line distance of the plot center). If two or more trails or roads are estimated to be equally distant, code the higher quality trail or road (lower code number). Base the coding decision on the condition of the road at the time of the visit.

When collected: All plots with at least one accessible forest land condition class
Field width: 1 digit
Tolerance: No errors
MQO: At least 90% of the time
Values:

- 0** None within 1 mile
- 1** Paved road or highway
- 2** Improved gravel road (has gravel, ditching, and/or other improvements)
- 3** Improved dirt road (has ditching, culverts, signs, reflectors, or other improvements)
- 4** Unimproved dirt road/four-wheel drive road (has no signs of any improvements)
- 5** Human access trail- clearly noticeable and primarily for recreational use

3.250 HORIZONTAL DISTANCE TO IMPROVED ROAD -- Record the straight-line distance from plot center (subplot 1) to the nearest improved road. An improved road (TRAILS OR ROADS = 1, 2, or 3) is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements.

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 90% of the time

Values:

- 1 100 ft or less
- 2 101 to 300 ft
- 3 301 to 500 ft
- 4 501 to 1000 ft
- 5 1001 ft to 1/2 mile
- 6 Greater than 1/2 to 1 mile
- 7 Greater than 1 to 3 miles
- 8 Greater than 3 to 5 miles
- 9 Greater than 5 miles

3.255 ROAD ACCESS -- Record the first road access restrictions encountered while traveling to the **plot's starting point**. These restrictions limit car and truck access to the starting point for the walk to the plot, and may occur on ownerships encountered before reaching the plot area.

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 90% of the time

Values:

- 0 None – no road access restrictions
- 1 Road blocked by locked gate or cable across road
- 2 Road blocked by a human-made obstruction across road (ditch, mound, etc.)
- 3 Road blocked by natural occurrences (trees blown over onto road, road or bridge washed out)
- 4 Posted no motorized vehicle signs; road present, but restricted area such as Wilderness or National Park where vehicles are not allowed
- 9 Other – specify in plot-level notes

3.360 PUBLIC USE RESTRICTIONS -- Record, if any, the restriction posted from the **starting point to the plot** that limits public use of the plot area; if more than one restriction occurs for the plot area, record the lowest number restriction present (1-3, 9).

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 90% of the time

Values:

- 0** None – no public use restrictions
- 1** Keep out / no trespassing
- 2** No hunting or fishing
- 3** No dumping
- 9** Other - specify in plot-level notes

3.270 RECREATION USE 1, 2, and 3 (3 opportunities) -- Record up to 3 signs of recreation use encountered within the accessible forest land portion of any of the four subplots, based on evidence such as campfire rings, compacted areas (from tents), hiking trails, bullet or shotgun casings, tree stands, etc. Record the recreation use that has had the most significant impact on the plot area first, then the second and third use. For example, in general numerous four-wheel drive or ATV trails would be coded before camping, and camping before hiking, and hiking before fishing. Use the coding system provided as a hierarchy. Do not repeat codes, except codes 0 and 9. Physical recreation evidence must be present to code 1-9. Also, disregard dumping where no evidence of recreation is present. Examine the plot area for clues before spending an exorbitant amount of time trying to find evidence that normally would not be found in the area; look for the obvious signs first.

When collected: All plots with at least one accessible forest land condition class

Field width: 3 digits

Tolerance: No errors

MQO: At least 90% of the time

Values:

- 0 No evidence of recreation use
- 1 Motor vehicle (four wheel drive, ATV, motorcycle, snowmobile)
- 2 Horse riding, dog team trails, ski trails
- 3 Camping
- 4 Hiking
- 5 Hunting/shooting
- 6 Fishing
- 7 Boating – physical evidence such as launch sites or docks
- 9 Other – recreation use where evidence is present, such as human litter, but purpose is not clear or does not fit into above categories.

3.280 WATER ON PLOT -- Record the water source that has the greatest impact on the area within the accessible forest land portion of any of the four subplots. The coding hierarchy is listed in order from large permanent water to temporary water. This variable may be used for recreation, wildlife, hydrology, and timber availability studies.

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 90% of the time

Values:

- 0 None – no water sources within the accessible forest land CONDITON CLASS
- 1 Permanent streams or ponds too small to qualify as noncensus water
- 2 Permanent water in the form of deep swamps, bogs, marshes without standing trees present and less than 1.0 ac in size, or with standing trees
- 3 Ditch/canal – human-made channels used as a means of moving water, such as irrigation or drainage which are too small to qualify as noncensus water
- 4 Temporary streams
- 5 Flood zones – evidence of flooding when bodies of water exceed their natural banks
- 9 Other temporary water – specify in plot notes

3.290 TERRAIN POSITION -- Terrain position is the location of the plot along the slope profile. Assess terrain position on the **plot**. The plot is defined as the area contained within the triangle formed by the outer boundaries of subplots 2, 3, and 4. This area is approximately **.84 ac**. Select the terrain position that best relates the sample point to the slope profile. To avoid micro-site conditions, a distance of 100 ft is the minimum span to consider.

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 90% of the time

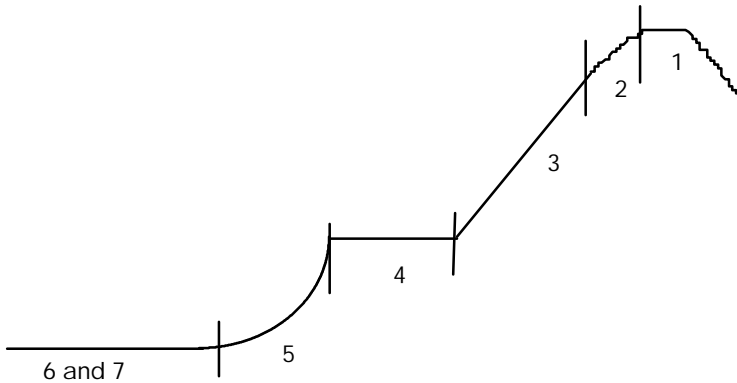
Values:

- 1 top-of-slope -- convex region
- 2 upper-slope – convex region at upper edge of slope
- 3 mid-slope – uniform, fairly straight region
- 4 bench – area of level land with slopes above and below
- 5 lower-slope – concave region at the lower end of slope
- 6 bottomland – horizontal region in low-lying areas. These areas may be subject to occasional flooding.
- 7 flatland – regions that are not part of, or related to, slopes. These areas may have minimal elevation changes of less than 5 %.
- 8 **See Chapter 9 – Nonforest / Denied / Hazard Data**

NOTE: TERRAIN POSITION is a Northeast regional variable that is recorded independently from the values obtained from the core variable's SUBPLOT SLOPE and ASPECT. Codes 1, 2, 3 and 5 have an overall "plot" slope 5% and greater (aspect 001 to 360), and codes 4, 6 and 7 have an overall "plot" slope less than 5% (aspect of 000).

Terrain Position

- 1 top of slope -- convex region
- 2 upper slope -- convex region at upper edge of slope
- 3 midslope -- uniform, fairly straight region
- 4 bench -- area of level land with slopes above and below
- 5 lower slope -- concave region at the lower edge of slope
- 6 bottomland -- horizontal region in low-lying areas, which may be subject to occasional flooding
- 7 flatland -- regions not part of or related to slopes; may have minimal elevation changes, i.e. less than 5 %



NOTE: Bottomlands are associated with drainage, while flatlands are not.

3.295 SITE PRODUCTIVITY CLASS -- On plots that are being remeasured, this field indicates the potential productivity class of the site where the plot is located. Based upon site index readings from previous inventories, a SITE PRODUCTIVITY CLASS would have been developed. Possible codes are 0, 3, 4, 5, 6, and 7. Code 0 indicates that cores were either unavailable or unable to be read during the last inventory. Code 7 indicates that the SITE PRODUCTIVITY CLASS was unproductive. Codes 3 through 6 indicate incremental levels of productive forestland.

When completing plots, it will be necessary to transfer this information from the county CORE list. The CORE list will indicate which remeasure plots require site index information.

NOTE: On remeasure plots do not use the site code from the plot print-out or data recorder history as a basis to collect site index. Always refer to the CORE list. And do not use the site code as a basis to collect STAND AGE. **All forested conditions require a STAND AGE.**

If a plot has been coded **0** or **7**, then site index cores must be collected for each condition class on the plot. Site index cores are also required for any forested condition class with a number higher than 1, **and for all forested condition classes on new plots.** (See Chapter 7 SITE TREE DATA.)

When collected: All plots with at least one accessible forest land condition class

Field width: 1 digit

Tolerance: No errors

MQO: At least 99% of the time

Values: 0,3,4,5,6,7

3.400 MANUAL VERSION -- Record the version number of the National Core Field Guide that was used to collect the data on this plot. This will be used to match collected data to the proper version of the field manual. (Note: This is the same number as the regional field guide.)

When collected: All plots

Field width: 2 digits (x.y)

Tolerance: No errors

MQO: At least 99% of the time

Values: 16

3.300 GPS COORDINATES -- Use a global positioning system (GPS) unit to determine the plot coordinates and elevation of all field visited plot locations. The Precision Lightweight GPS Receiver (PLGR), manufactured by Rockwell, Inc. will be used in the Northeast.

GPS UNIT SETTINGS, DATUM, and COORDINATE SYSTEM

Consult the GPS unit operating manual or other regional instructions to ensure that the GPS unit internal settings, including Datum and Coordinate system, are correctly configured.

Each FIA unit will determine the Datum to be used in that region. Most will use the NAD 27 Datum (also known as NAS-C or NA 27 CONUS/CLK66), but coordinates collected using any appropriate datum can be converted back to a national standard for reporting purposes.

Each FIA unit will also determine which coordinate system to use. Regions using a Geographic system will collect coordinates in Degrees, Minutes, and Seconds of Latitude and Longitude; those using the UTM coordinate system will collect UTM Easting, Northing, and Zone.

COLLECTING READINGS

Collect at least 180 GPS readings at the plot center. These may be collected in a file for post-processing or may be averaged by the GPS unit. Each individual position should have an error of less than 70 ft if possible (the error of all the averaged readings is far less).

Soon after arriving at plot center, use the GPS unit to attempt to collect coordinates. If suitable readings (180 readings at error \leq 70 ft) cannot be obtained, try again before leaving the plot center.

If it is still not possible to get suitable coordinates from plot center, attempt to obtain them from a location within 200 ft of plot center (i.e., another subplot). Obtain the azimuth and horizontal distance from the "offset" location to plot center. (Record this "offset information" in the General Notes or Calculation box on page 4 of the tally sheet.) If a PLGR unit is used, use the Rng-Calc function in the PLGR to compute the coordinates of the plot center.

Coordinates may be collected further than 200 ft away from the plot center if a laser measuring device is used to determine the horizontal distance from the "offset" location to plot center. Again, if a PLGR unit is used, use the Rng-Calc function in the PLGR to compute the coordinates of the plot center. In all cases try to obtain at least 180 positions before recording the coordinates. The following paragraphs describe how to obtain PC coordinates based on different field situations.

- **Geo-referencing plot center for all plots where PC is occupied and witnessed:** After completing the traverse to PC from either the PLGR calculations or by using the previous course to plot information, stand at PC and hold the Rockwell PLGR antenna plumb over the dowel. Wait (3 to 5 minutes) until the PLGR indicates the horizontal error is less than ± 70 ft on the POS screen.

When the horizontal error of less than ± 70 ft is achieved, indicating the highest possible accuracy, press and hold the <POS> key until AVG appears. Allow the unit to average approximately 180 fixes. As the counter nears 180, be prepared to record the latitude and longitude on page 3 of the tally sheet. Press and hold the <POS> key to stop averaging. Press the <OFF> key twice.

For new plots established by GPS coordinates, crews must be within 100.0 ft of the label coordinates for satisfactory plot establishment.

- **New nonforest plots where PC is not occupied or witnessed:** After establishing and recording a course to plot using the PLGR, enter "plot coordinates" from the label on the Page 3 tally sheet for variables 3.310 – 3.360. Enter the label coordinates only if traverse is not completed and PC is not occupied or witnessed. If PC is occupied, follow the procedure previously described in "geo-referencing plot center."
- **Remeasure nonforest plots where the previous SP is still present:** Stand at the old starting point (SP) and collect coordinates as previously described. Write the 180th position displayed on the PLGR in the SP GPS section of the Page 3 tally sheet.

Press the <WP> key and enter this SP coordinate as a new waypoint. Press <WP> key again and toggle to "RNG-CALC". Activate the menu and change the default waypoint number to the SP waypoint you previously entered. Enter the previously calculated values for distance and azimuth to PC (i.e., previous course to plot) into the PLGR in the "RNG" and "AZ" fields by pressing the <NUM LOCK> key. Press the down arrow key to see the calculated position of PC. Enter this coordinate in the PC GPS section of the Page 3 tally sheet in variables 3.310 through 3.360. Enter this coordinate only if traverse is not completed and PC is not occupied or witnessed. If PC is occupied, follow the procedure previously described in "geo-referencing plot center."

- **Remeasure nonforest plots where the previous SP is not present:** Using the old photography follow the instructions in sections 2.000 – 2.120 to establish a new course to plot. Stand at the new SP and collect coordinates as previously described. Write the 180th position displayed on the PLGR in the SP GPS section of page 3 of the tally sheet.

Press the <WP> key and enter this SP coordinate as a new waypoint. Press <WP> key again and toggle to "RNG-CALC". Activate the menu and change the default waypoint number to the SP waypoint you previously entered. Enter the new calculated values for distance and azimuth to PC (i.e., new course to plot) into the PLGR in the "RNG" and "AZ" fields by pressing the <NUM LOCK> key. Press the down arrow key to see the calculated position of PC. Enter this coordinate in the PC GPS section of the Page 3 tally sheet variables 3.310 through 3.360. Enter this coordinate only if traverse is not completed and PC is not occupied or witnessed. If PC is occupied, follow the procedure previously described in "geo-referencing plot center."

3.310 DEGREES OF LATITUDE -- Enter the degrees of latitude as shown on the GPS receiver. Enter 099 in *Hammerhead* PDR, if GPS unit is offline. This will complete the screen until coordinates can be taken.

When collected: All plots
Field width: 2 digits (DD)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.320 MINUTES OF LATITUDE -- Enter the minutes of latitude as shown on the GPS receiver.

When collected: All plots
Field width: 2 digits (MM)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.330 SECONDS OF LATITUDE -- Enter the seconds and hundredths of seconds of latitude as shown on the GPS receiver.

When collected: All plots
Field width: 4 digits (SSSS)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.340 DEGREES OF LONGITUDE -- Enter for the degrees of longitude as shown on the GPS receiver. Enter 099 in *Hammerhead* PDR, if GPS unit is offline. This will complete the screen until coordinates can be taken.

When collected: All plots
Field width: 2 digits (DD)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.350 MINUTES OF LONGITUDE -- Enter the minutes of longitude as shown on the GPS receiver.

When collected: All plots
Field width: 2 digits (MM)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.360 SECONDS OF LONGITUDE -- Enter the seconds and hundredths of seconds of longitude as shown on the GPS receiver.

When collected: All plots
Field width: 4 digits (SSSS)
Tolerance: No errors
MQO: At least 99% of the time
Values:

3.361 NUMBER OF READINGS -- Record a 3-digit code indicating how many readings were averaged by the GPS unit to calculate the plot coordinates. Collect at least 180 readings if possible. (If 3.370 LOCATION OF GPS READING is 2, then record the value collected at this location, e.g., SP.)

When collected: All plots
Field width: 3 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: 1 to 999

3.365 ELEVATION -- Record the elevation above mean sea level of the plot center, in feet, as determined by GPS. Highest peak in the Northeastern US is Mt Washington at 6,288 ft. (If 3.370 LOCATION OF GPS READING is 2, then record 9999.)

When collected: All plots
Field width: 4 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: -0100 to 6300, 9999

3.370 LOCATION OF GPS READING -- Enter a one-digit code to indicate where the GPS reading for the plot was taken.

When collected: All plots
Field width: 1 digit
Tolerance: No errors
MQO: At least 99% of the time
Values:

- 1 Positions collected over plot center
- 2 Positions taken from a location other than over plot center

3.375 GPS ERROR -- Record the error as shown on the GPS unit to the nearest foot. Make every effort to collect readings only when the error is less than 70 ft. However, if after trying several different times during the day, at several different locations, this is not possible, record the best reading that can be obtained with an error of up to 999 ft. (If 3.370 LOCATION OF GPS READING is 2, then record the value collected at this location, e.g., SP.)

When collected: All plots
Field width: 3 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: 0 to 70 if possible, 71 to 999 if an error of less than 70 cannot be obtained

3.380 GPS SERIAL NUMBER -- Record the last six digits of the serial number on the GPS unit used.

When collected: All plots
Field width: 6 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: 000001 to 999999