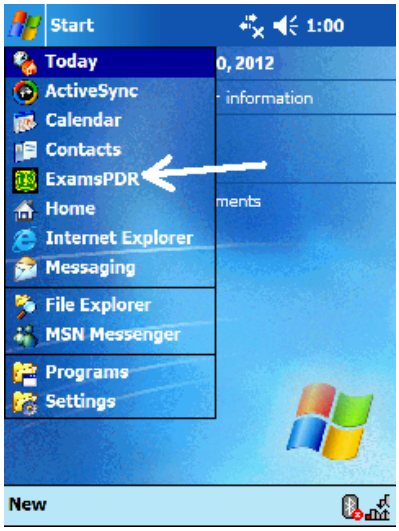
2016 Data Collection Procedures for the Chippewa NF using a Portable Data Recorder

Data Recorders will be used for all Common Stand Exam on the Chippewa National Forest. Using the data recorder for field data collection introduces error checking in the field, reducing the number of errors that are brought into the office to load into FSVeg. Transcription errors from hard copy data sheets to the computer are eliminated. Uploading data into FSVeg is also greatly facilitated. Data is "ready to use" as soon as it comes in from the field and is uploaded into FSVeg. These instructions are written for a Dell Axim, but should work with any data recorder.

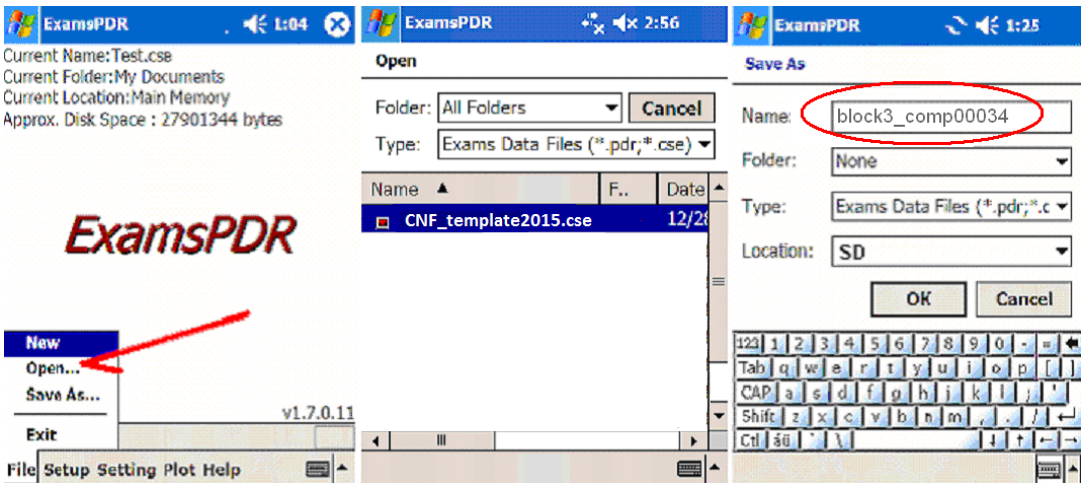


Execute the PDR Software

On data recorder, use the stylus to tap the "Start" menu. When the drop down menu opens, tap "ExamsPDR". The Exams program opens.

The menu bar at the bottom of the display is what you will use to maneuver through the ExamsPDR program. To start out tap "file" and then "open" to open your template file. This has the sample design you will be working with and is named "CNF_template2016.cse. Create a new bid item template by selecting the Project Name from your User Definitions, and making it the default. Then, "Save As" (under the file option) and name a new template.

Once the new bid item template file is open go back to the "file" option and tap "Save As". The "Save As" window opens. Name the file using the block number. Other text can be added if you wish, but include the block number as part of the name. Using this naming convention will help you organize your data and easily identify files containing data you or the FS might want to go back to later. Always save the file to your memory card (not Main memory).



Once the file has been saved you may enter data. The first step is to create the setting you will be working in. Do this by tapping "Setting" on your menu bar and then tapping "Setting Data Wizard".

In the next screen, tap the "Insert" button. A setting screen will open to "Pg. 1". Here you will only need to fill in 4 fields.

1) "RD" is the number of the Ranger District (01= Blackduck, 03 = Deer River, 05 = Walker).

2) Fill in the "Location" with the 5 digit compartment number, **using leading zeros**.

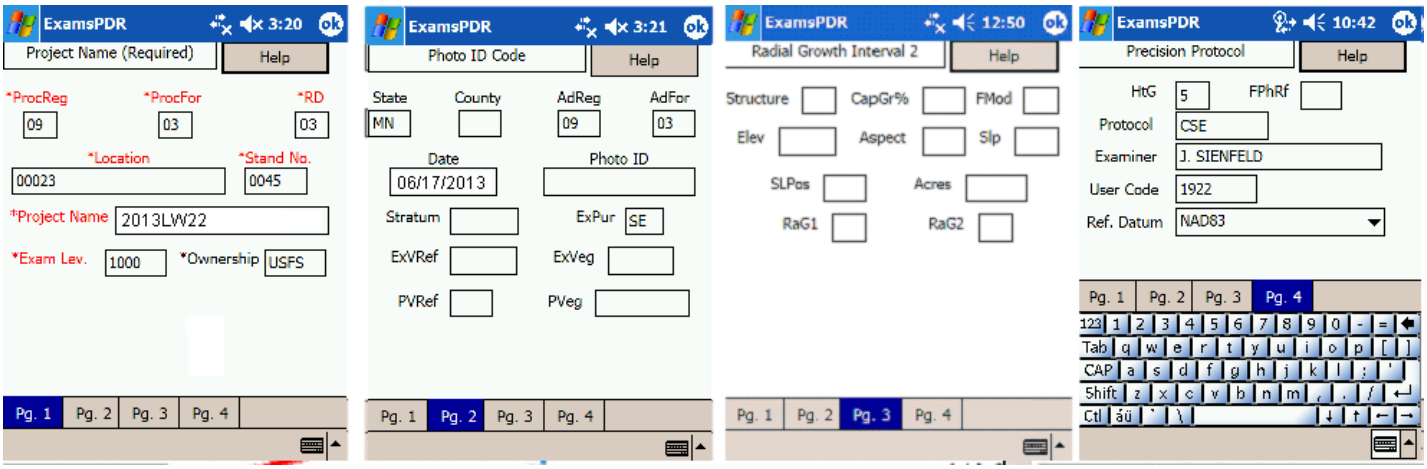
3) Complete the "Stand No." with the 4 digit stand number, **using leading zeros**.

4) "Project Name" will be either "2016KE1", "2016KET2", "2016KET3", "2016KET4", "2017KET5", "2016KET6", "2016KET7", "2016MC8", "2016MC9", "2016MC10", "2016MC11", "2016MC12", "2016MC13", or "2016AD14". If you created a template file where the correct project name was set as the default you will not have to retype the project name into each next setting you create.

On "Pg. 2", the date will need to be filled in. This is the date that the setting was inventoried. Usually the same day you create the setting. Other required fields should be filled in automatically as in the following figure.

On "Pg. 3", nothing should need to be filled in.

On "Pg. 4", Protocol, Examiner (12-characters) and Year of Origin (User Code) must be entered. The protocol should be "CSE". Enter the examiners name (not the contractors name unless the contractor is doing the exam). If the full name is longer than 12 characters, use only the initial of first name and entire last name, or just the last name. **Do not use reserved characters such as +, /, -, or * in this field**. In the User Code block enter the 4 digit year of origin for the stand **AFTER** the plot data has been collected.



Page 1

PR (Proclaimed Region) (automatically defaults)
PF (Proclaimed Forest) (automatically defaults)
RD (Ranger District) (defaults, but check to be sure the correct district number is entered! For this project the district will be either '01' '03'or '05').
Location (Compartment number. Enter leading zeros to make a total of 5 digits.)
Stand No. (Stand number. Leading zeros enter automatically to make a 4 digit number.)

Project Name (set this to automatically default). For this 2016 project:

Code	Description
2016KET1	A. bid item 1 Ketchum
2016KET2	B. bid item 2 Ketchum
2016KET3	C. bid item 3 Ketchum
2016KET4	D. bid item 4 Ketchum
2016KET5	E. bid item 5 Ketchum
2016KET6	F. bid item 6 Ketchum
2016KET7	G. bid item 7 Ketchum
2016MC8	H. bid item 8 Middle Creek
2016MC9	I. bid item 9 Middle Creek
2016MC10	J. bid item 10 Middle Creek
2016MC11	K. bid item 11 Middle Creek
2016MC12	L. bid item 12 Middle Creek
2016MC13	M. bid item 13 Middle Creek
2016AD14	N. bid item 14 Ash Diversification

Exam Level (automatically defaults to '1000')
Owner (USFS - automatically defaults)

Page 2

State (automatically defaults)
County (automatically defaults)
AdReg Administrative Region (automatically defaults)
AdFor Administrative Forest (automatically defaults)
Date (the date of the actual field data collection.)
Photo ID (leave blank)
Stratum (leave blank)
ExPur Exam Purpose (should be 'SE' automatically defaults)
ExVRef (leave blank)
PVRef (leave blank)

Page 3

Structure (leave blank)
CapGr% (leave blank)
FMod (leave blank)
Elev (leave blank)
Aspect (leave blank)
Slp (leave blank)
SlPos (leave blank)
Acres (leave blank)
RaG1 (defaults to '10')
RaG2 (leave blank)

Page 4

HtG (defaults to '5')
FPhRf (leave blank)
Protocol (defaults to 'CSE')
Examiner (enter name of person conducting the exam) **KEEP IT UNIFORM**
User Code (enter the year of origin)
Ref Datum (NAD83)
Mag. Declination (leave blank)

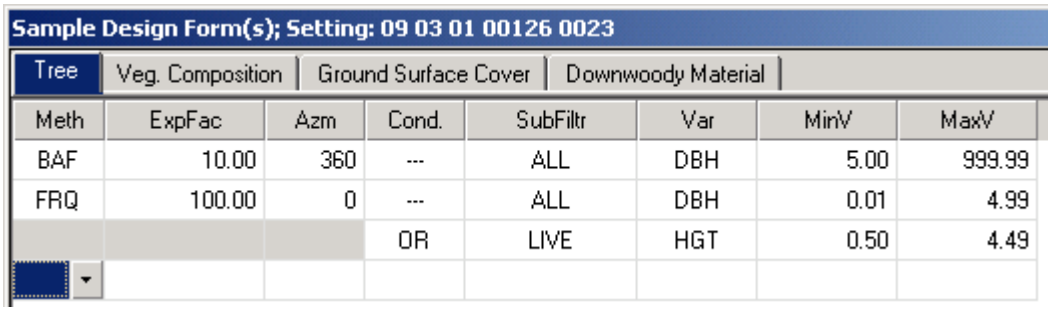
Many of these fields populate automatically. Only a few actually have to be completed by the examiner.

User Code (Year of Origin)

The contractor will determine the year of origin for each stand. For multi-aged stands, base the year of origin on the oldest trees in a stand, where those oldest trees have a basal area of at least 50 ft^2/acre. If the basal area of the overstory trees is less than 50 ft^2/acre, base the year of origin on intermediates or understory. Enter the year of origin into the "User Code" found on page four (4) of the setting information (for the stand shown in "Setting Data" above, the year of origin is "1922"). The ages of site trees may be helpful in determining the year of origin. Additional increment borings may be required.

Sample Design

The Sample Design Form is already defined in the template file. Do not make changes to this.



Meth	ExpFac	Azm	Cond.	SubFiltr	Var	MinV	MaxV
BAF	10.00	360	---	ALL	DBH	5.00	999.99
FRQ	100.00	0	---	ALL	DBH	0.01	4.99
			OR	LIVE	HGT	0.50	4.49

Tree Tab

Overstory trees with a DBH of 5"+ are measured using an angle gauge with a BAF of 10. A BAF of 10 will always be used for overstory trees. Both live and dead trees are counted.

Pole trees are measured on a 1/100th acre fixed radius plot. Pole trees are those with a DBH of .01" to 4.99". Both live and dead trees are tallied.

Seedling trees are also tallied on the 1/100th acre fixed radius plot. Seedling trees are trees less than 4.5 feet tall, but at least 6 inches in height (in other words, they don't have a DBH). Only live seedlings are recorded.

Veg. Composition, Ground Surface Cover, & Down Woody Material Tabs

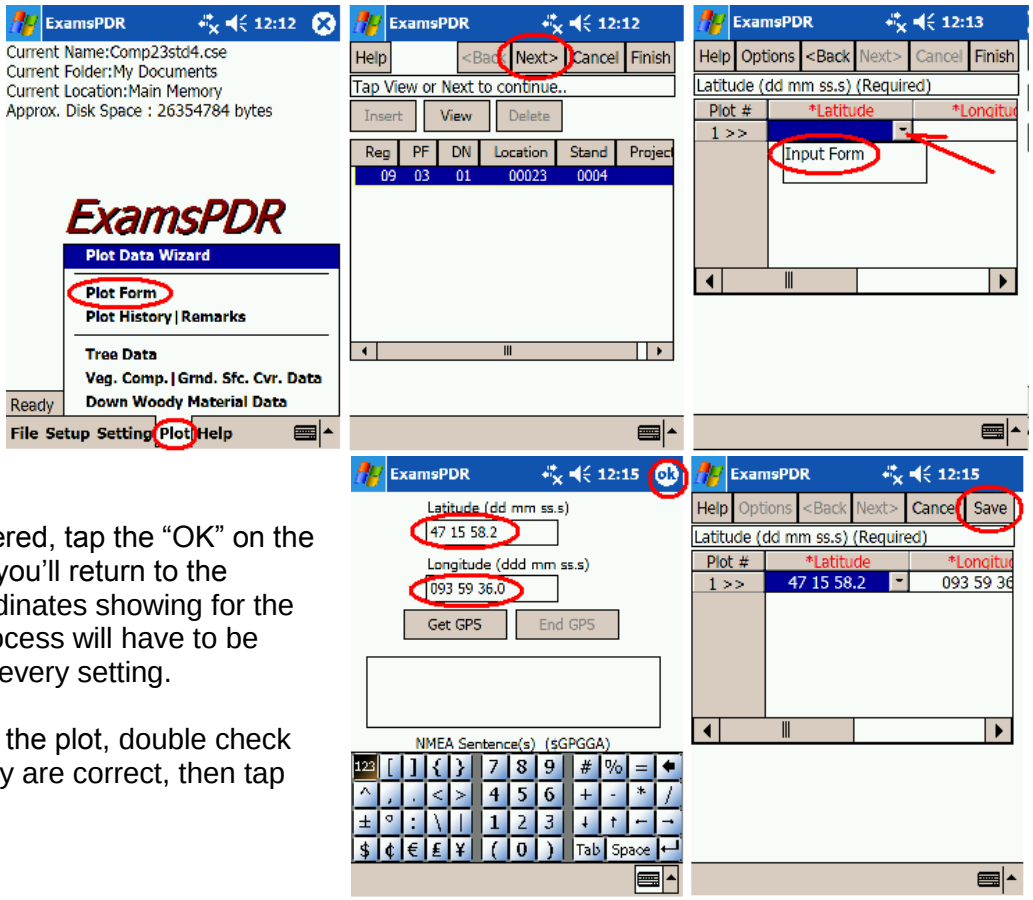
There is no data to collect for Vegetation Composition, Ground Surface Cover or Down Woody Material. There are therefore no protocols under those tabs.

Data Forms

Creating Plots

From the menu bar select "Plot". From the dropdown menu select "Plot Form". With the setting selected (it's blue when selected) tap the "Next" button. When the next form opens use the dropdown arrow to display the menu that says "Input Form". Tap "Input Form" on this menu.

The “Input Form” is where you actually create the plot. This needs to happen before you can enter any plot data and should be the first thing you do when you arrive at a sample location. You will create the plot by entering the Latitude and Longitude. This can be done by manual entry from the keypad. Use the coordinates assigned, not those from your GPS.



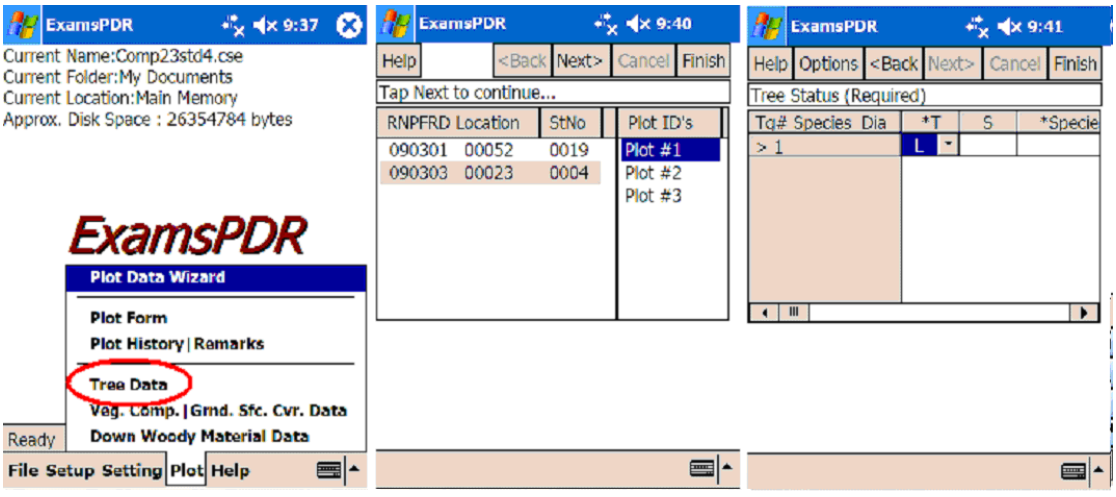
Once the coordinates are entered, tap the “OK” on the upper right of the screen and you’ll return to the previous screen with the coordinates showing for the plot you just created. This process will have to be repeated for each new plot in every setting.

When you’re finished creating the plot, double check the coordinates to be sure they are correct, then tap the “Save” button.

Tree Data

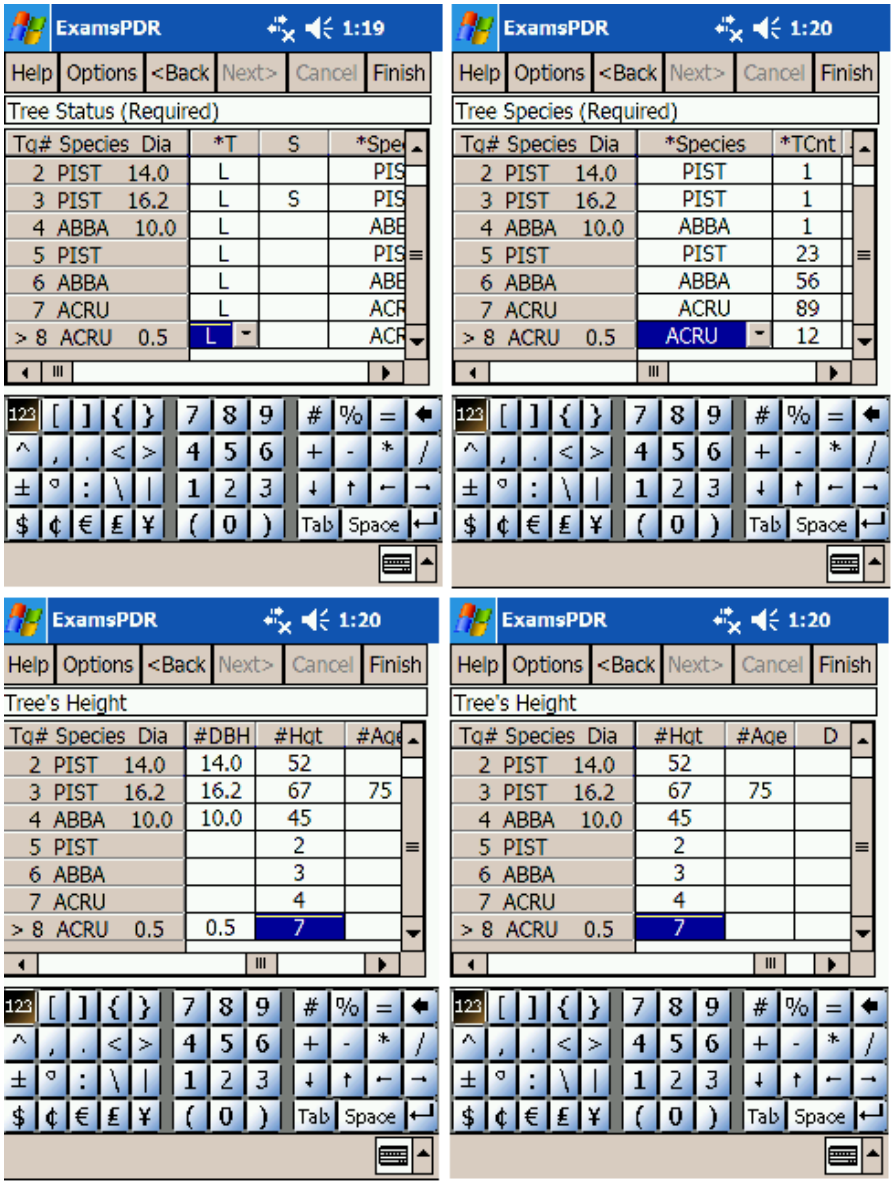
To open the tree data form, tap “Plot” on the menu bar. In the dropdown menu tap “Tree Data”. On the next screen select the setting and plot you want to enter tree data for. Once you tap the plot number the blank tree data screen opens (far right in figure below).

The images in the following figure show data for trees #2 thru #8 after being entered. In the first column “*T”, you will enter either “L” for Live or “D” for Dead from a dropdown menu. Do not use the other options of “X”, “Y”, or “S”.



Column “S” is used for site trees. Three site trees will be measured in each setting, no more than one per plot so they will be distributed through the setting. Locate site trees on the plots if possible. If no good candidates exist on the plots, site trees may be selected off the plots. An “S” is recorded for a site tree on a plot. Enter “F” for a site tree off a plot. All site trees in a setting must be of the same species. Site trees should be trees that have been free to grow throughout their lives. Tie a pink flag around each site tree and mark it with the tree “TagID” number using

permanent marker. Leave the increment core in the increment hole in the tree trunk, projecting somewhat, so it may be retrieved and used by plot inspectors. If the increment breaks place it on the ground at the base of the tree for inspectors to find. Record the GPS coordinates for "off plot" site trees in the plot remarks of the nearest plot to the off plot site tree. Measure diameters of site trees to two inch size classes, as all other trees with a DBH. See site tree specifics.



Seedlings are trees below DBH (4.5 feet) with a height of at least six inches. Only live seedling trees are recorded, so their "Tree Status" will always be "L". No diameters are recorded for seedling trees. Seedling tree heights must be recorded to the nearest foot.

In the "Species" field use the dropdown menu to select a species code (use "Help" for definitions).

The "TCnt" field is for the number of trees represented by the record you're working with. Enter a number from the keypad. To facilitate plot inspections, do not group overstory trees (DBH >= 5") in the tree count column. Make a new record for each tree. Seedlings and poles may be grouped (DBH < 5"). Also, always start collecting tree data with the tree nearest to a north azimuth from plot center. This will be tree "TagID" 1 when recorded.

Enter a DBH in the "#DBH" column. These are in two inch size classes (a 2" size class includes trees from 1" to 2.9"; a 8" size class includes trees from 7" to 8.9", and so on), except for trees less than 1" in diameter. For trees with a DBH less than 1", estimate the tree diameter at breast height to the nearest tenth inch. No diameters are entered for seedlings (because they are below DBH).

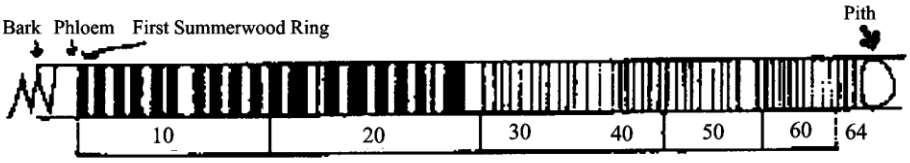
In the "#Hgt" field, enter the tree height to the nearest foot for all trees, including seedlings.

Both live and dead trees are measured and recorded for all trees other than seedlings. Only live trees are measured and recorded for the seedling class.

Count **stump sprouts** as individual trees. If there are 6 sprouts on a stump, count them as 6 seedlings, saplings, or trees, depending on their size.

Boardline Trees: Use the limiting distance contained in the EXAMS program to determine if a tree is "in" or "out", when using the 10 factor angle gauge. Distance on borderline trees is measured to the face of the tree and not the center. With the tree's record selected (dark blue) hit the "Options" button in the menu bar. Select "In|Out" from the dropdown menu. With the keyboard, enter the measured distance to the tree in the "SDist" field and hit the "Compute" button. The program tells you the limiting distance and whether the tree is "in" or "out". On the 1/100th acre fixed plots a tree is in if its base is ½ within the plot.

Enter the age of site trees in the "#Age" field. No other ages are required. For trees 3.0 inches DBH and larger, age is determined from an increment boring made at breast height. To facilitate inspections, the increment boring should be made at breast height facing plot center on level ground. On a slope, bore site trees on the uphill side of the tree at breast height. Age is counted from the most current summerwood ring to the pith of the tree. Record the age (rings) counted, ***do not*** add an estimate of the number of years to grow to breast height. In the following example, the ring count is 64 years, so record "64" for the tree age.



No damage codes ("D" field) are required for individual trees (but will be recorded for the setting). Do not record "harvests" as "damage". When all the tree data has been entered for a plot, tap the "Finish" button in the upper right corner of the form.

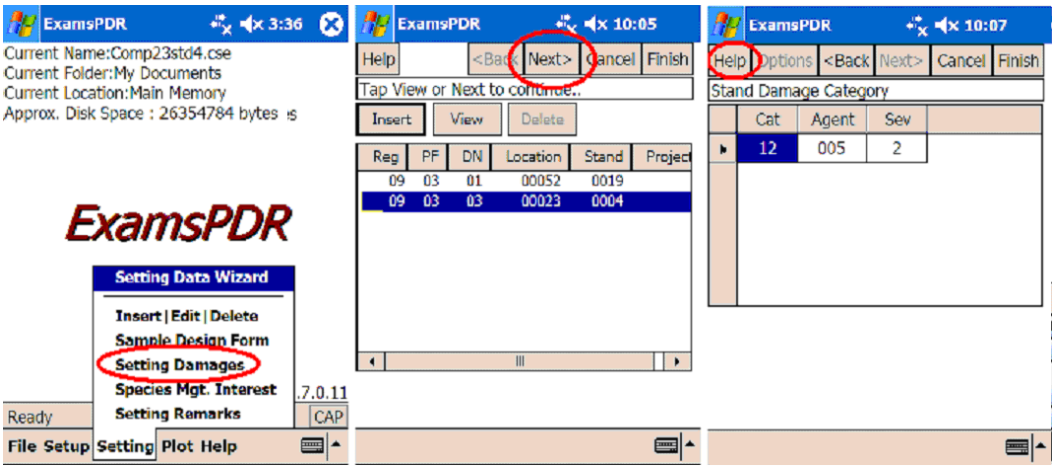
Site Trees *- A site tree is a tree for which age and height are measured to determine site index and yield capacity for a tree. Site trees have never experienced any overstory competition or damage that would have reduced height growth during any period of their life. Freedom from height growth suppression is the single most important selection criteria for site trees. Site trees should be sampled on every other plot if possible, with a minimum of three/setting. Locate site trees on the plots if possible. If no good candidates exist on the plots site trees may be selected off the plots as indicated above.* ***All site trees in a setting must be of the same species****. Select a species that best represents the current stand composition for site trees.*

Site Tree Selection Criteria

1. *Freedom from height growth suppression*
   - *Choose dominants or co-dominants.*
   - *No evidence of top damage, past or present.*
   - *No damage that could influence height growth.*
   - *No pronounced period of radial growth suppression.*
2. *Select a species that best represents the stand.*
3. *Similar age class, preferably middle-aged, avoiding old growth and young age classes. Typically > 50 years and < 120 years.*
4. *Select at least three site trees for each setting.* ***Tree species should be representative of a featured species in the stand.*** ***Select site trees of the same species throughout the stand.***

If none of the trees on at least three plots meet the above criteria, select the nearest off-plot trees that do meet the criteria. Use code "S" to designate site trees located on the plot. Use code "F" to designate off-plot site trees.

Setting Damage



Damage in a stand will be recorded in the "Setting Damage" screen after the data from the plots has been recorded. Examiners should note any damage in the stand as they examine the plots. How to enter damage is illustrated in the figures. Select the "Setting" option from the menu at the bottom of the screen. In the pop up menu select "Setting Damages". On the next screen select the correct setting and tap the "Next" button. The next screen that opens has three fields to complete from drop down lists. These are "Cat" (category), "Agent" (specific agent or vector), and "Sev" (severity or degree of damage). Select options for each field from the dropdown obtained for each by placing the cursor in the field and tapping the "Help" button.

There may be stands that have no damage. In those cases nothing needs to be entered. Conversely, there may be stands where there is more than one type of damage. In those cases, a second (or third, etc.) line will need to be entered in the "Damage" screen. To add additional lines for damage, open the keyboard and tap the down arrow. A new record will appear. Repeat this process for each type of damage that is present in the stand.

Year of Origin

The contractor will determine the year of origin for each stand. For multi-aged stands, base the year of origin on the oldest trees in a stand, where those oldest trees have a basal area of at least 50 ft^2/acre. If the basal area of the overstory trees is less than 50 ft^2/acre, base the year of origin on intermediates or understory. Enter the year of origin into the "User Code" found on page four (4) of the setting information (for the stand in the figure on page 2, the year of origin is "1922"). The ages of site trees may be helpful in determining the year of origin. Additional increment borings may also be required.

Enter the year of origin in the "User Code" space on the 4th page of the setting (see last figure on page 2). To get to this page select "Setting" from the menu bar. Select "Insert|Edit|Delete" from the pop-up menu. Highlight the setting you want and then hit the "Edit" button. Tap "Pg.4", and enter the year of origin into the "User Code" box. Then to save, tap "OK" at the upper right corner of the screen, then tap "Finish" at the upper right corner of the following screen.

Setting Remarks

The presence of garlic mustard or buckthorn will be indicated by simply stating the name of the species seen in a setting along with GPS coordinates, in the Setting Remarks. Record "garlic mustard" or "buckthorn", along with a GPS coordinate, where either of these species are seen growing in a setting in any abundance (even a single plant).

Contractors will receive a $10 incentive payment for each setting they identify as having either of these species, not to exceed 2% of the total value of any bid item.

Submitting Data

Make sure the file is saved to the memory card (SD or CF) and not the data recorders memory. If not saved to the memory card the file will be lost if the data recorder looses power. It is recommended that at the end of each day all data files created that day be copied to a laptop to create a backup of the data.

The Chippewa NF will inspect the stand examinations to determine compliance with contract specifications and to provide a basis for payment. The Contractor shall submit completed stand information every seven (7) days during the contract period. Files will be e-mailed weekly, on weekends, so they have arrived and are ready to load on Monday mornings. Each week's work will constitute a "block". Electronic files (*.cse) should be named to correspond to these blocks. Submit these files to ghswanson@fs.fed.us, rrjohnson@fs.ed.us, argustafson@fs.fed.us and lburke@fs.fed.us.

Completed work, consisting of required electronic data will be turned in for inspection. Inspection will only be made on completed stands. At least 5% of the plots within a block will be selected for inspection to determine if the prescribed work standards have been met. This will constitute the minimum sample plot inspection for determining satisfactory performance. Each block of work will be judged acceptable or unacceptable based on the 5% inspection.

The Government will make the initial inspection of each block of completed stands without cost to the Contractor. No charge will be made for the first rework inspection on the Contractor's first work block. Thereafter, any re-inspection required due to the Contractor reworking a block will be at the Contractor's expense. Re-inspection charges may include, but are not limited to: inspector's wages for travel time to and from work site; inspector's wages to re-inspect; per diem cost (meals, lodging, field costs); COR wages; and vehicle use rate and mileage.

Determination of Acceptable Work

The following criteria will be used for determination of acceptable or unacceptable work. For each block the number of errors is multiplied by the point value. Points are then tallied for each form. On the setting form a final score is derived by dividing the total points by the number of settings inspected. On the plot form a final score is derived by dividing the total points by the number of plots inspected. On the large and small tree forms a final score is derived by dividing the total points by the number of trees inspected. A block will pass if the total score for any individual form is less than "5", and the total points for all forms combined is less than "10".

Data Standards

Blocks will pass or fail inspections based on specified standards. These can be seen in the following three tables. These are what your work will be "graded on". Data not meeting these standards will be returned to the contractor for rework.

Setting Data Form

Field	Tolerance	Point Value
Year of Origin	+/- 10%	5
Project Name	No Errors	Unacceptable
District	No Errors	Unacceptable
Location	No Errors	Unacceptable
Stand	No Errors	Unacceptable

Examiner	No Errors – must be completed uniformly	Unacceptable
Damage Category	Subjective summary	2
Damage Agent	Subjective summary	2
Damage Severity	Subjective summary	2
Setting Remarks	Presence of garlic mustard or buckthorn.	2

Plot Data Form

Field	Tolerance	Point Value
Plot Location (Plot Coordinates)	No errors Plot must be able to be re-located by the inspector and deemed to be within 10 meters of the pre-assigned coordinates.	6
Plot Number (everything "lines up".	No errors The correct number of plots must be submitted for each setting unless deferred in writing by the project manager. Plot coordinates must be accurate. Plots must fall within the stand.	10

Large Tree Data Form

Field	Tolerance	Point Value
Tag ID	No Errors	10
Tree Status	No Errors allowed in recognizing and coding dead or live trees	50
Tree Species	No Errors	50
Tree Count[1]	No Errors	75
DBH	No Errors Trees must be within the correct 2" diameter class.	17
Height	± 10 % on all trees except site trees.	10
Site Trees		
Selection[2]	No Errors	Unacceptable
DBH	No Errors	10
Height	± 5 %	30
Tree Age	± 10 %	10

1/ No tolerance for recording a tree when none are actually present in the designated 2-inch diameter class. The

recording of a variable plot tree when none are present will result in an unacceptable error.

Height Range	Diameter Range	Trees on plot	Tolerance
All	All	0	0 trees
≤ 4.5 feet		1-5	+/- 2 trees
≤ 4.5 feet		6+	+/- 50%
> 4.5 feet	<1 inch	1-5	+/- 1 tree
> 4.5 feet	<1 inch	6+	+/- 20%
All	1" – 4.9" dbh	1-5	+/- 1 tree
All	1" = 4.9" dbh	6+	+/- 10%
All	5"+ dbh+	1+	0 trees

2/ All site trees within a setting must be same species.

Small Tree Data Form

Field	Tolerance	Point Value
Tree Status	No Errors. No dead trees allowed.	20
Tree Species	No Errors	20
Tree Count[1]	See footnote 1 below.	20
DBH[2]	See footnote 2 below.	10
Height	± 10 %	10

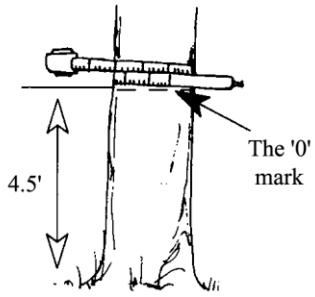
1/ No tolerance for recording a tree when none are actually present in the designated 1-inch diameter class. The recording of a fixed plot tree when none are present will result in a single discrepancy.

Height Range	Diameter Range	Trees on plot	Tolerance
All	All	0	0 trees
≤ 4.5 feet		1-5	+/- 2 trees
≤ 4.5 feet		6+	+/- 50%
> 4.5 feet	<1 inch	1-5	+/- 1 tree
> 4.5 feet	<1 inch	6+	+/- 20%
All	1" – 4.9" dbh	1-5	+/- 1 tree
All	1" = 4.9" dbh	6+	+/- 10%
All	5"+ dbh+	1+	0 trees

2/ 2/ All trees must be within correct 2-inch diameter (large tree) and 1-inch (small tree) classes.

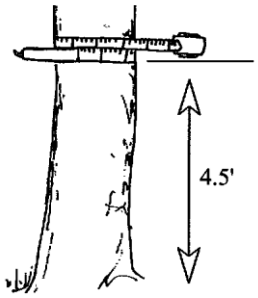
Proper Use of a Diameter Tape

Correct Method



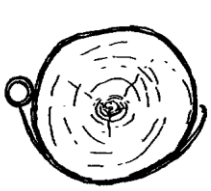
End of tape (with the '0' mark or hook) crossed under.

Optional method if left handed



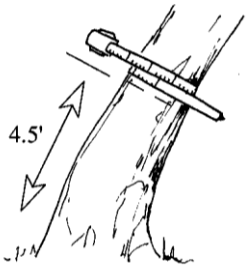
End of tape crossed under. (Be careful - reading will be made from upside down d-tape marks.)

Press the tape firmly against the tree. Do not pull it out at a tangent to the tree at the point of measurement.

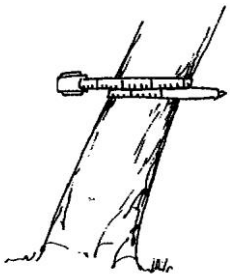


Correct

Incorrect

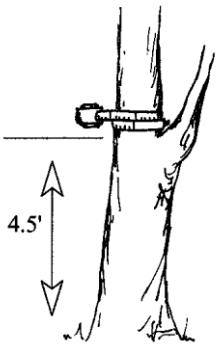


Correct

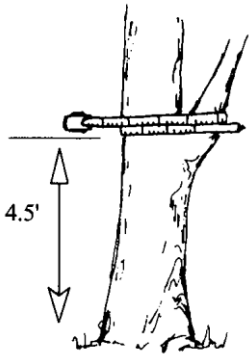


Incorrect

Tape must be at right angles to lean of tree.



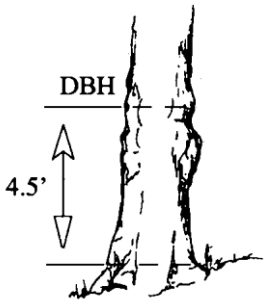
Correct



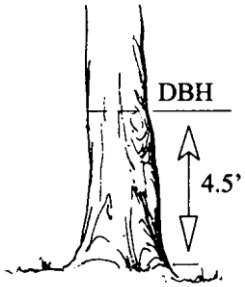
Incorrect

Do not place tape at abnormal location on bole of tree.

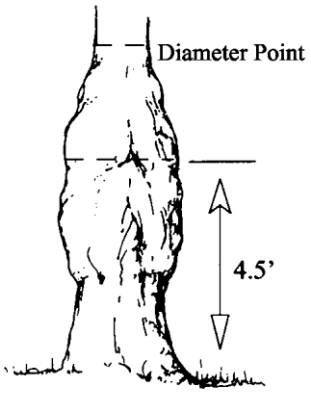
Point of Measurement for DBH



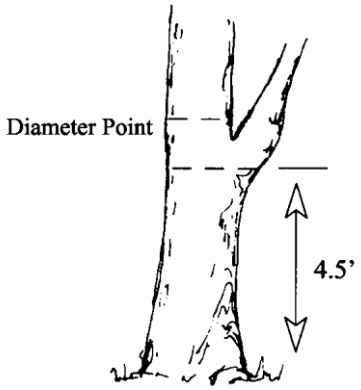
Tree on slope



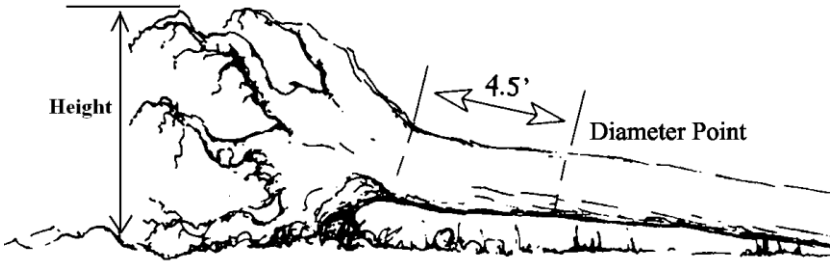
Tree on level ground



Tree deformed at DBH by swelling or crook. Take DBH above deformation.

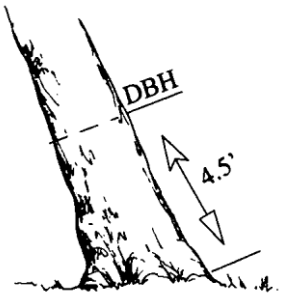


Tree with branch at 4.5 feet

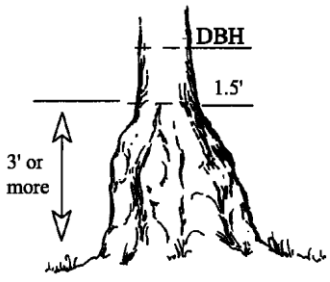


Windthrown tree

Windthrown trees: *If a windthrown tree has roots still attached and in the ground, and the tree is still alive, count it as a live tree. Measure DBH and height as illustrated. Measure the highest point on the tree. This might be roots or branches. Do not measure the "length" of the tree on the ground as the height. If a tree in this situation is dead, it is not counted as a tree (it is now fuel).*

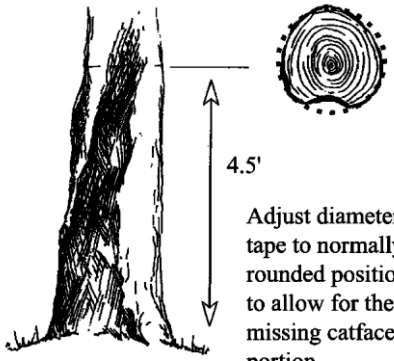


Leaning tree

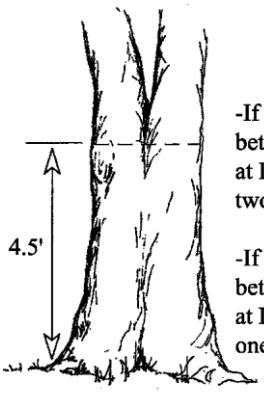


Bottleneck tree

Point of Measurement for DBH (cont.)



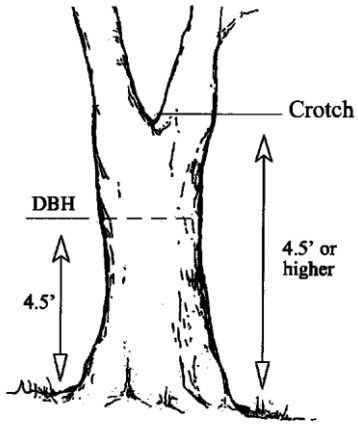
Tree with a catface



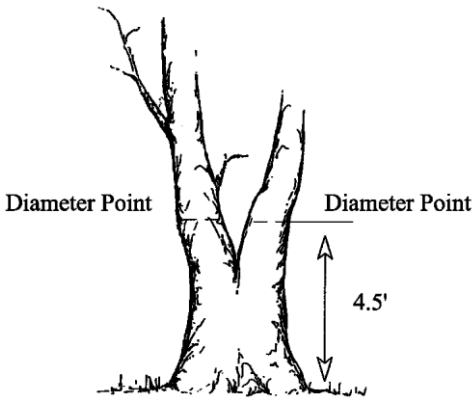
-If you can see light between the two stems, at DBH, measure as two separate trees.

-If you cannot see light between the two stems, at DBH, measure as one tree.

Catface: *Use this same technique on snags where part of the bole is missing at DBH.*

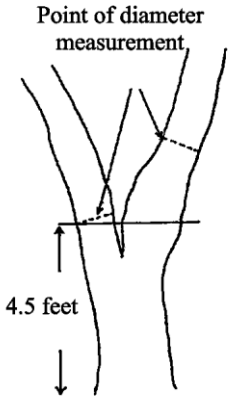


Tree forked at 4.5 feet or higher. Record as one tree and consider only the main fork. Take DBH below the swell of the fork.



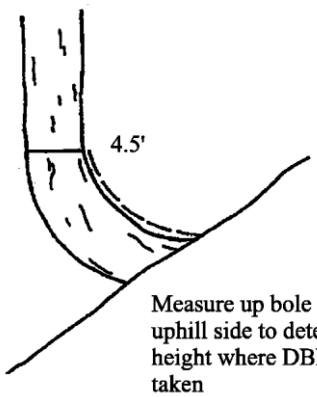
Tree forked below 4.5 feet. Record each fork that is "in" as a separate tree. Measure diameter at 4.5 feet.

Point of Measurement for DBH (cont.)



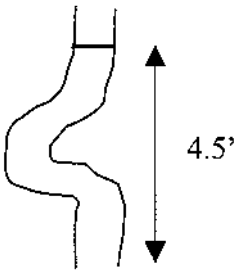
Measuring abnormal diameters on forked trees

Diameter on abnormal fork

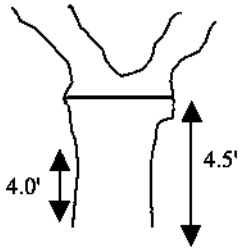


Measure up bole of tree on uphill side to determine height where DBH should be taken

Diameter on pistol butt tree



DBH measurement for a pistol butt shaped tree



Tree forked at DBH. Unable to get a DBH tape through crotch. Take DBH below the swell of the fork.

Examination date must be correct.