

Deer Density Estimation (Pellet Group Count)

This technique, used to estimate deer density, requires 4 pieces of data:

1. Number of pellet groups deposited per day per deer (constant)
2. Period of time pellet groups are deposited (variable)
3. Number of pellet groups counted in plots (variable)
4. Area sampled by plots for pellet groups (variable)

1.) Recent work, conducted by observers following deer for 24 hour periods, found that deer actually deposit on average 25 pellet groups per day.

2.) Annual leaf fall in deciduous forests covers up pellet groups: only pellet groups deposited after leaf fall are visible for counting the following spring. The technique calls for counting pellet groups in spring after snow melt and assumes that all pellet groups counted were deposited after leaf fall the previous fall. Most of the leaves are gone by November 15 on the Allegheny Plateau, so deposition period is calculated by counting the number of days between November 15 and the date pellet groups are counted.

3.) Number of pellet groups counted is simply the total number of pellet groups observed within the sample plots. Use 4 foot radius sample plots within which all pellet groups are counted. Sample pellet groups within area approximately the size of a deer's home range, one square mile or 640 acres. Run parallel transect lines one mile long (5280 feet), 1000 feet apart.

4.) Area sampled is computed in square miles. This will end up giving the number of deer per square mile.

Instructions: Pellet Groups

1) Fill out header, indicating the site, date, observer name(s), and weather.

2) Pellet groups are counted within 4 foot radius plots located at 100 foot intervals along transect lines one mile long. The first plot taken is 100 feet from the starting point from the beginning of each transect line, and the last plot is ~ 100 feet from the end of the line. At the end of each transect take a 90° bearing and travel 1,000 feet to the starting point of the next transect. There should be 52 plots per line (exceptions: plots inside fenced enclosures, or that fall in bodies of water aren't counted).

3) There must be at least 10 pellets in a group before it is counted, at least half of the pellets must be within the 4 foot radius plot, and pellets must be on top of leaves or other vegetation. Record pellet groups with a dot tally (see instructions below).

4) If fenced enclosures or ponds/lakes are encountered along the transect line, either climb over the fence/wade through the water and continue along the transect line, or take a sighting on the other side of the fence/water, walk around, and resume the line. Do not count plots, pellet groups, or impact inside the fence or body of water but do monitor distance inside fence (to keep total transect length 5,280 feet).

5) Record the total number of plots and pellet groups for each transect line (top of form).

6) Record any dead deer sighted. Record data as dot tally (see below). May want to differentiate between adults and fawns, bucks and does.

7) Calculate Deer Density =
$$\frac{\text{\# Pellet Groups Counted}}{\text{Pellet Groups/Day} \times \text{Days Since Leaf Off} \times \text{Square Miles of Plot Area}}$$

Instructions: Deer Browse Impact Survey (Impact levels depicted on Deer Impact Graphic.)

- 1) Select six indicator tree seedling species based upon findings in your survey area. List them on data sheet from least preferred to most preferred based on a browse preference scale by white-tailed deer.
- 2) Record deer impact to seedlings within the 4 foot radius plot based on six seedling species selected. Record data for seedlings \leq 6 feet tall.
- 3) Impact will be recorded at every other pellet group plot.
 - a) If no regeneration $<$ 6 feet exists on plot, record as a dot in box **“Plots Without Regen.”**
 - b) If regeneration $>$ 6 inches is present but is not browsed, record as a dot in box **“Plots With Regen, no Impact.”**
 - c) Record impact for each of the 6 indicator species present on the plot as follows. Record impact in appropriate impact level box.
 - 0** = no impact
 - L** = light impact – 1-50% of stems are browsed, seedling $>$ 6 inches tall, $<$ 6 feet tall.
 - M** = moderate – more than 50% of stems are browsed but seedling is not hedged, seedlings $>$ 6 inches tall, $<$ 6 feet tall.
 - H** = heavy – more than 50% of stems are browsed, seedling is hedged (browsed to ball of short twigs), seedlings $>$ 6 inches tall, $<$ 6 feet tall.
 - S** = severe – more than 50% stems are browsed, seedling is hedged and is less than 6 inches tall.
- 4) Record all data as a dot tally for all data entries for each transect line.

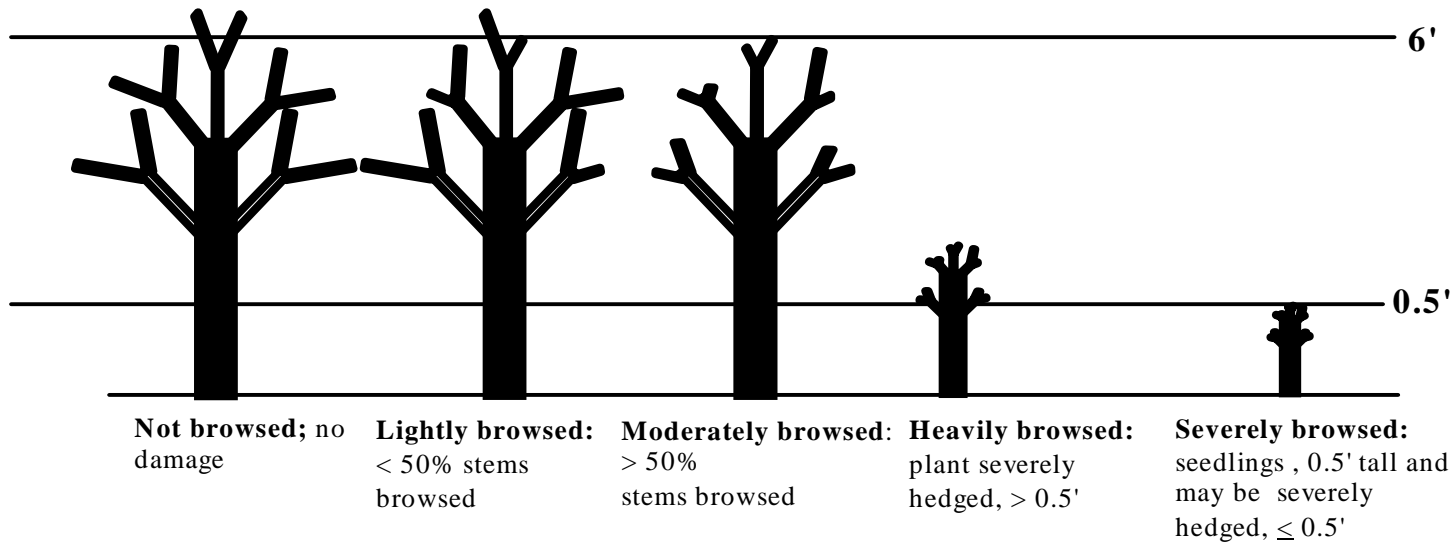
Recording dot tally data: 1st data entry = one dot (•). 2nd data entry, add another dot (••). 3rd data entry, add another dot (•••). 4th data entry, add one more dot (••••). 5th entry, connect 2 dots with a line (••). 6th entry, connect another 2 dots with a line (••). 7th data entry, connect 2 more dots with a line (•••). Etc. For the 9th and 10th data entry make an X through the middle of the square. The eleventh data entry starts with a new dot tally.

Equipment Needed:

- 1.) Good quality compass
- 2.) Walking stick marked at 4’ lengths for determining 4’ radius plots
- 3.) Mechanical pencil (the places for entering data on the sheets are small)
- 4.) Clipboard for holding data sheet
- 5.) Data sheet

Skills Needed:

- 1.) Ability to navigate in the woods with a compass and pacing.
- 2.) Ability to identify deer pellet groups
- 3.) Ability to identify seedlings of six woody species to be used in browse impact.



Seedlings > 0.5' provide best evidence of browsing damage. Under severe deer browsing, seedlings may never exceed 0.5' tall and will be severely hedged*: deer browsing keeps them suppressed below 0.5'. Small, current year seedlings may never grow above 0.5' under severe deer browsing.

*** Severely hedged = seedling browsed repeatedly over years; all stems short, thick, with "bonsai" appearance.**

Questions? Call or e-mail:

David deCalesta - 607-292-6078; wildana@earthlink.net

Tim Pierson – 814-887-5613; tgp2@psu.edu

Dave Jackson – 814-355-4897; drj11@psu.edu