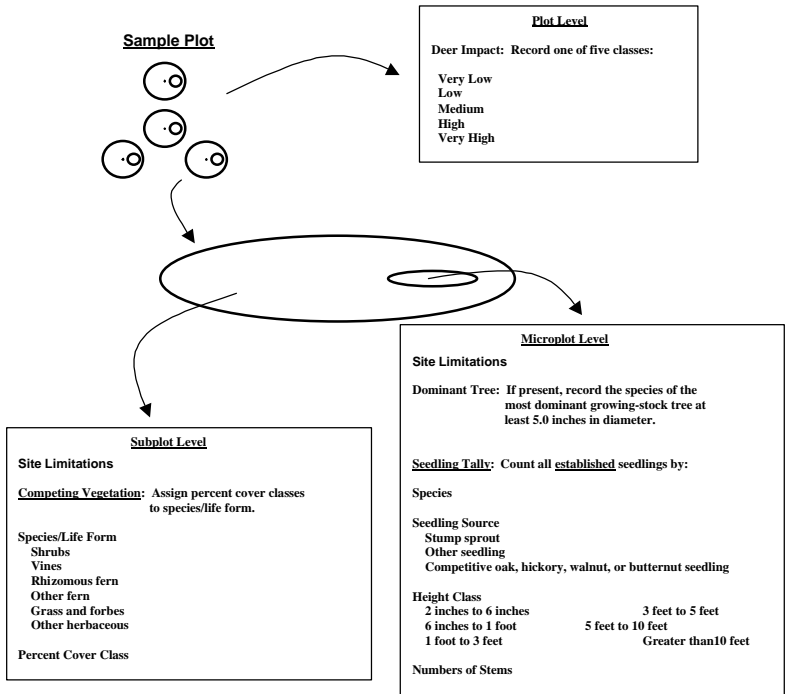


## APPENDIX 12 – SPECIAL STUDIES

### Field Instructions for Pennsylvania's Regeneration Assessment

**Overview** -- The regeneration assessment is being conducted in Pennsylvania at the request of the State's forestry community. There is concern that regeneration is lacking in many stands and with over half of the State's forests in a financially mature condition, this is a critically important issue. The regeneration data will provide answers to questions about advance regeneration, post-disturbance regeneration, and future forest composition. The data will be used to quantify regeneration adequacy statewide, provide estimates of numbers of seedlings per acre, and for research into regeneration dynamics. Regeneration plots are selected prior to the field season and are visited during the leaf-on season from June through September.

The figure below summarizes measurements needed for the regeneration assessment. Data are collected at three levels: the entire sample plot, the subplot, and the microplot. **The competing vegetation and regeneration tallies should be completed for all accessible forest land conditions that are encountered.**



**PLOT DATA**

**State, Unit, County, and Plot Number** -- Refer to Chapter 3 of this field guide.

**Month/Day/Year** -- Refer to Chapter 3 of this field guide.

**Deer Impact** -- Estimate the amount of browsing pressure that deer are exerting on regeneration. Deer impact is a function of deer population and the amount of available food sources within one-square mile surrounding the plot.

<b>Code</b>	<b>Definition</b>
<b>1</b>	<b>Very Low</b> - Plot is inside a well-maintained deer enclosure.
<b>2</b>	<b>Low</b> - No browsing observed, vigorous seedlings present (no deer enclosure present).
<b>3</b>	<b>Medium</b> - Browsing evidence observed but not common, seedlings present.
<b>4</b>	<b>High</b> - Browsing evidence common <u>OR</u> seedlings are rare.
<b>5</b>	<b>Very High</b> - Browsing evidence omnipresent <u>OR</u> forest floor bare, severe browse line.

Degree of deer browsing can be a difficult variable to quantify due to preferences that deer have for various food sources and the elusive nature of deer populations. Although not a complete list of species in Pennsylvania, the following deer preference list may be useful for assigning deer impact:

<b>Species</b>	<b>Browse Preference</b>	<b>Tolerance of Browsing</b>
Black Cherry	L	L
Fern	L	H
Grass & Sedge	L-M	H
Striped Maple	L-M	H
American Beech	M	H
Birches	H	M
Oak	H	M-H
Hickory	H	M-H
Ash	H	M
Rubus spp.	H	M-H
Pin Cherry	H	L
Red Maple	H	L
Sugar Maple	H	L
Yellow-poplar	H	L
Cucumbertree	H	L
Eastern Hemlock	H	L

In addition, a handout showing the Pennsylvania Game Commission's estimates of deer density by county will be provided. Deer densities in excess of 20 deer per square mile of forest are generally considered to inhibit the development of tree seedlings.

**SUBPLOT DATA** -- Complete the subplot data for all forested conditions.

**Subplot Number** -- Record the code corresponding to the subplot number.

**Condition Class Number** -- Record the corresponding condition class number.

**Site Limitations** -- Record site limitation codes 2 and 3 if they occur on at least 30 percent of the subplot or condition area, else record as code 1.

1	No site limitations
2	Rocky surface with little or no soil
3	Water-saturated soil (during the growing season)

**Competing Vegetation** -- Assign percent cover classes to species/life forms within the subplot. The sum of the percent cover classes may exceed 100 percent. For subplots with more than one condition, only record percent cover for the portion of the subplot in the condition. For example, if 50 percent of the subplot is in a condition and is entirely covered with *Rubus* spp., record 99 for percent cover class (100 percent cover).

### Species/Life Form

	Deciduous Shrubs, all valid NEFIA species codes (see Appendix 4)
	Evergreen Shrubs, all valid NEFIA species codes (see Appendix 4)
	Vines, all valid NEFIA species codes (see Appendix 4)
001	Rhizomous Fern, including Bracken, Hay-scented, and New York
002	Other Fern
003	Grass
004	Other Herbaceous

**Percent Cover Class** – Assign a cover class to each species or life form.

Code	Definition	Code	Definition
01	1 to 9 percent	50	50 to 59 percent
10	10 to 19 percent	60	60 to 69 percent
20	20 to 29 percent	70	70 to 79 percent
30	30 to 39 percent	80	80 to 89 percent
40	40 to 49 percent	90	90 to 100 percent

As an aid in determining percent cover, consider that one-percent cover of the 24-foot radius subplot is equivalent to a square 4.2 feet on each side or a circle with a radius of 2.4 feet. Ten percent cover is equivalent to a square 13.4 feet on each side or a circle with a radius of 7.6 feet.

**MICROPLOT DATA** -- Complete the microplot data for microplots within accessible forest land.

**Microplot Number** -- Record the code corresponding to the microplot number (same as subplot number).

**Microplot Center Condition Class** -- Record the corresponding condition class number.

**Site Limitations** -- Record the following site limitation if it dominates the area of the microplot or condition:

1	No site limitation
2	Rocky surface with little or no soil
3	Water-saturated soil (during the growing season)
4	Thick duff layer (in excess of two-inches thick)

**Dominant Tree** -- Record the presence/absence of at least one growing-stock tree 5.0-inches or larger in diameter at breast height on the microplot or condition by recording species code. If there are no such trees, record as "000." If more than one such tree is present, record the species code of the tree with the largest diameter.

**Tree and Seedling Data** -- Tally all established seedlings (<1.0-inch DBH) for stems rooted within the microplot by species, seedling source, and height class.

Count all seedlings at least 2-inches tall with at least two normal-sized leaves that do not still bear cotyledons.

For most species encountered, the tug test should be used to determine if seedlings are established. Seedlings that slip out of the ground with a slight tug do generally not have sufficient root systems to survive through the growing season and are not established.

- Small oak, hickory, walnut, and butternut seedlings (less than 1-foot tall) should be at least 6-inches tall or have a root-collar diameter (RCD) of at least 0.20 inches.
- Pine seedlings should have at least two whorls or be at least 6-inches tall.

**Species** -- Record valid NE-FIA tree species code (see Appendix 4).

**Seedling Source** -- Discriminate between stump sprouts and other seedlings. Tally clumps of stump sprouts as one seedling and tally only the tallest, most dominant sprout for each stump. Tally sprouts on stumps that originate from cutting or mortality only. Stumps must be at least 2 inches in diameter to qualify as having sprouts.

A special code (3) is used for oak, hickory, walnut, and butternut that are classified as “competitive.” Research indicates that competitive seedlings are highly likely to become dominant or codominant stems in the next stand. To be classified as competitive, stems must have an RCD > 0.75 inches. In situations with relatively high tally, it should only be necessary to check a few RCD's.

Code	Definition
1	Stump sprout
2	Other seedling
3	Competitive oak, hickory, walnut, or butternut seedling

**Height Class** – Each seedling is assigned a height class.

Code	Definition	Code	Definition
1	2 inches to 6 inches	4	3 feet to 5 feet
2	6 inches to 1 foot	5	5 feet to 10 feet
3	1 foot to 3 feet	6	Greater than 10 feet

**Numbers of Stems** -- Record the number of tree seedlings in each category described by species, seedling source, and height class. The first five seedlings of each species must be counted precisely. Counts above five may be estimated. In the case of beech root suckers, count all individuals unless they arise from a single root node, in which case they should be counted as a single stem.





**PDR PROGRAM FUNCTION KEYS ARE:**



**PRESENCE OR ABSENCE OF INVASIVE SPECIES IN PENNSYLVANIA**

From the provided list of invasive species, indicate whether or not they are present on each subplot.

