

VEGETATION MONITORING OVERVIEW
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INTRODUCTION

This report is intended to give an overview of the methodology used during the vegetation study.

The study was a partial replication of a similar study conducted during the summer of 1987. It is partial in the respect that the original transects and points could not be replicated. Estimation of transect start locations had to be made; however data collecting methods paralleled the original methods.

The reasons for conducting the vegetation study centered around the impacts of white-tailed deer on the vegetation at the park. A better description can be had by reviewing DEER AND VEGETATION INTERACTIONS ON SARATOGA NATIONAL HISTORICAL PARK, (1991).

METHODS

The sampling team consisted of three main people over the summer with the occasional help of others. These were Chris Marten, Cathy Ebelke and Michael Begier. Grog Fisher and Kim Baker provided the occasional assistance.

A series of transects were created on a field topographic map of the park. These transects were in a northeast-southwest direction, the compass bearing being 43 degrees North. The transects were 1000 feet apart. Sample points were 500 feet apart. These distances were measured by foot pace which was determined beforehand. Thirteen transects were created with only twelve being sampled. (see attached field map)

The location of the first sample points were determined from a random number table. This random distance in feet was then paced from the park boundary from where the transect was beginning. Foot pace was determined by pacing a one hundred foot distance and counting the number of times the individual paced. "Paced" for our purposes was when the left foot contacted the ground. *NOTE* It is our hope that in the event of a replication these beginning sample points are preserved. (see table)

SAMPLING POINTS (review data sheet) Upon arriving at a sample point the top of the data sheet should be completed first. This will include: the date, transect number, point number, slope (%), aspect (in degrees), ground cover and canopy cover.

Concurrently the rest of the crew should be arranging the stake flags within the sampling area. (see diagram of sampling point)

Four different vegetation strata: seedlings, shrubs,

saplings and trees are measured. The parameters to be measured include: DTPC (distance to point center), S (status, live or dead), HT (height), UQ (utilization qualifier), UI (utilization intensity), HTH (height to highest, which was the height to the uppermost browsed vegetation, ie. twig, not leaf unless clearly discernable), DBH (diameter breast height), NND (nearest neighbor distance, which was the distance to the nearest same species regardless of age class, this was not done for seedlings), D (distance), and R scales 1 & 2 and L scale. The parameters measured vary with the strata in question. (review data sheet)

UQ and UI are subjective measurements. These two measurements refer to the browse impacts on the vegetation sampled. The Utilization Qualifier addresses the type or types of browse observed. There are eight categories: 0-no browse, 1-this summer, 2-last winter, 3-older, 4-all three (1 2 3), 5-last winter and older, 6-this summer and last winter, 7-this summer and older. The Utilization Intensity deals with intensity of the browse which can fall into one of four categories: 1-(0-25%), 2-(26-50%), 3-(51-75%), 4-(76-100%).

Field data were entered into a dbase file. For purposes of convenience in both entering and analysis we employed two data base files. One file consisted of the information on the top of the data sheet; the other held the bottom information. We labeled these vegsortA and vegsortB, respectively. Note after data is entered sorting of the data base may be needed so differing names will probably be used; the separation between file A and file B must be maintained. Once sizeable portions of data are present within these data bases double checking and editing will be required. The final amount of points that we sampled was 119. Data base file A had 119 records, data base B 1744 records. The dbase files from 1987 and 1992 reside within the resource management office; also a dbase analysis program is located there.

This project also lent itself to GIS (geographic information systems) and GPS (geographic positioning systems) applications. During this project the points where transects crossed parts of the tour road were preserved using these technologies. Actual sampling points were to be preserved in this manner but at this date they were not. This application of data management should be evaluated if the project is attempted in the future.

EQUIPMENT AND SUPPLIES

All measurements were made using the metric system; with the exceptions of percentage estimations and scale measures involved with tree height calculations.

Distance and height measurements required field tapes. A fifty and/or twenty-five meter tape was employed. A meter stick was helpful when measuring small vegetation heights and distances. DBH measurements were made with a metric DBH tape. Small diameter saplings were measured with vernier calipers. The height measurements for large trees, saplings and occasional shrubs were done with a clinometer and an abney level. Either instrument works well in this capacity. Knowledge of these

instruments aid in understanding the portion of the data sheet devoted to height measures. The convention of DBH being 4 feet above the ground was employed also. Ground and cover canopies were measured with a periscope densiometer. The slope of the sample area was measured with the abney level or clinometer. The aspect was measured with a compass.

The basic field requirements of pencils and clipboards will need to be handled. Small packs in which to carry materials were invaluable. More than one compass was brought out into the field. The group member that began a transect (compass and pace) was usually required to finish the transect. We felt that this assisted in decreasing bias of more than one member pacing a transect. Occasionally binoculars helped when identifying large tree species by leaf characteristics. Tall stake flags were also needed to mark the "boundaries" of the sample site. A permanent marker was used to mark these flags. The flag marking "plot center" was marked in the following manner: T (transect), # (number); the point number is put underneath this. It is helpful to do this on both sides of the flag. Alternate means of marking the point if deemed better should be substituted. In areas of heavy vegetative growth extra flagging (orange tape) was used. This will prove helpful in the event of a revisit.

POINT-CENTERED QUARTER FIELD DATA SHEET

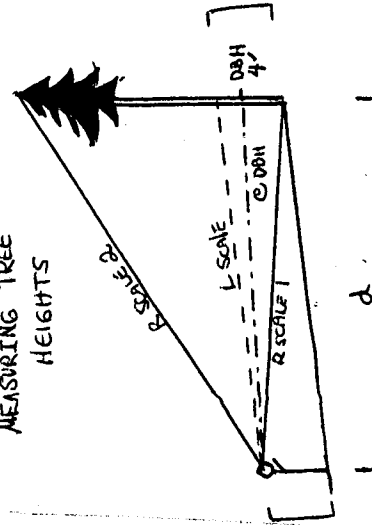
Date _____ Tran. No. _____ Point No. _____ Slope (%) / Aspect (°) _____ / _____
 Ground Cover / Canopy Cover (%) _____ / _____

Species	DTPC	S	HT	UQ	UI	HTH
Seedlings: (< 1 m)						
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

General: Record data clockwise around the point starting from the Southwest quarter. Measure slope in the azimuth direction of aspect. A nearest neighbor can be in any direction and at any distance $\leq 250'$. Restrict search to a maximum radius of 10 m for seedlings and 60 m for shrubs. Record height for smaller shrubs in the d column.

Species	DTPC	dbh	S	R Scale ₁	R Scale ₂	d	@dbh	L Scale	NND	UQ	UI	HTH
Shrubs: (Cornus, Viburnum, Zanthoxylum, Spirea, Hamamelis, etc.)												
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Seedlings: (≥ 1 m and < 10.3 cm dbh)												
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Trees: (≥ 10.3 cm dbh)												
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

MEASURING TREE HEIGHTS



YYMMDD

01PC: distance to point center (m)

R Scale₁: olinometer's right-hand scale for base of tree
 R Scale₂: olinometer's right-hand scale for top of tree
 d: distance to tree (m)

@dbh: Yes, if R Scale₁ measured at dbh rather than base of tree; otherwise, No
 L Scale: olinometer's left-hand scale for bias correction due to steep slopes (measured at eye level)

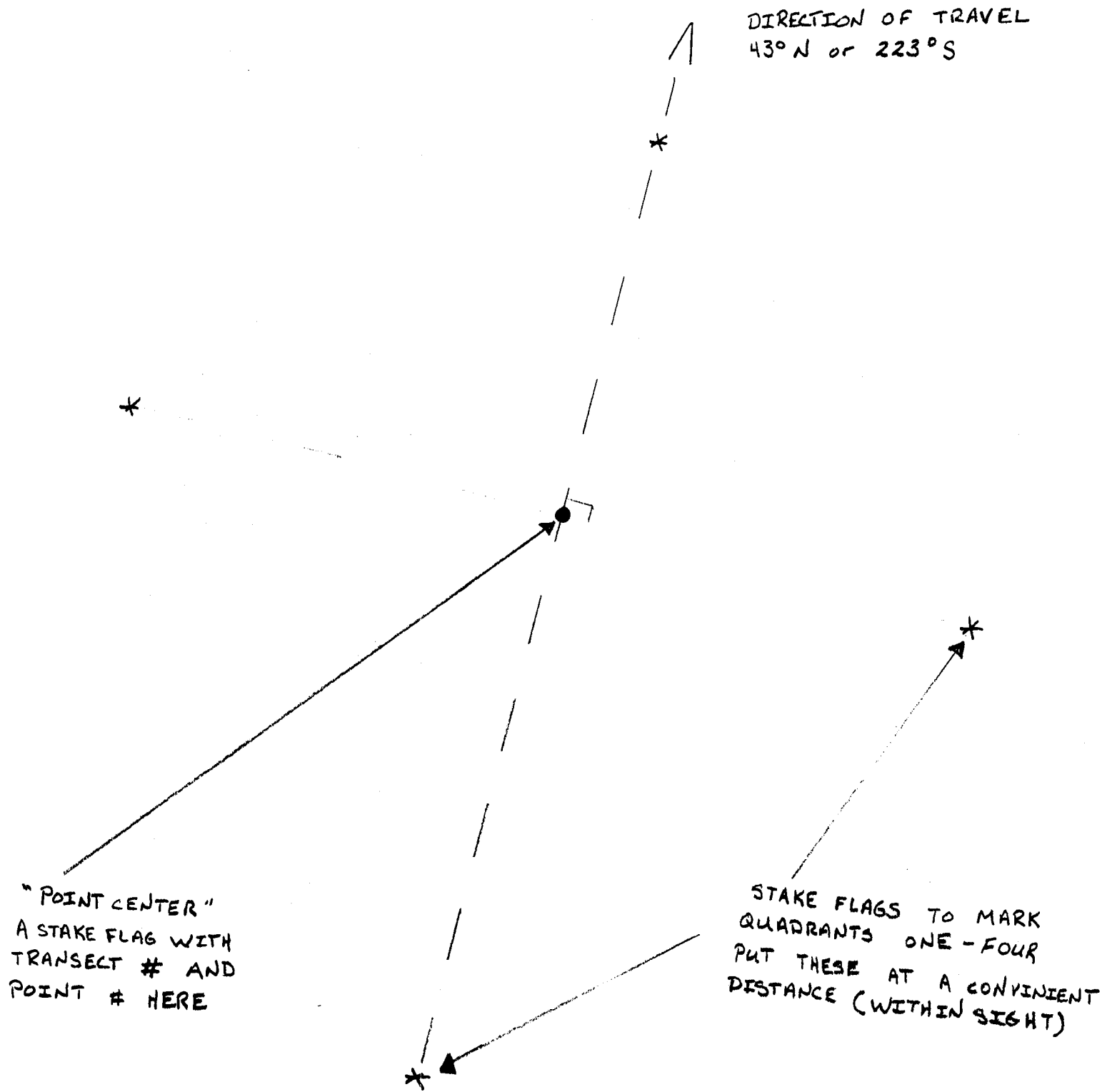
NND: Nearest neighbor distance (m) of same species

UQ: utilization qualifier (0=no browsing, 1=this summer, 2=last winter, 3=older, 4=all three)
 UI: utilization intensity (0=no browsing, 1= 0-25%, 2= 26-50%, 3= 51-75%, 4= 76-100%)
 HTH: height to highest browsed stem (m)

S: status (0=dead, 1=live)

2+3=5
 1+2=6
 1+3=7

DIAGRAM OF SAMPLE POINT ON A TRANSECT



* QUADRANT I WILL BE
THE AREA THAT IS THE
SOUTHWEST QUADRANT,
THE REST ($\pi - \theta$) WILL

SHRUBS

Alnus rugosa
Alnus serrulata
Cornus alternifolia
Cornus florida
Cornus racemosa
Cornus stolonifera
Gaylussacia baccata
Hamamelis virginiana
Lonicera tatarica
Spiraea alba
Spiraea latifolia
Spiraea tomentosa
Vaccinium corymbosum
Viburnum acerifolium
Viburnum alnifolium
Viburnum dentatum
Viburnum lentago

TREES

Acer negund
Acer rubrum
Acer rubrum var. trilobum
Acer saccharum
Betula lenta
Betula lutea
Betula papyrifera
Betula populifolia
Carpinus caroliniana
Carya ovata
Carya glabra
Castanea dentata
Chamaecyparis thyoides
Crataegus spp.
Fagus grandifolia
Fraxinus americana
Fraxinus pennsylvanica
Fraxinus profunda
Fraxinus nigra
Juglans cinerea
Ostrya virginiana
Pinus strobus
Populus grandidentata
Populus tremuloides
Prunus serotina
Prunus virginiana
Pyrus spp.
Quercus alba
Quercus bicolor
Quercus macrocarpa
Quercus rubra

Quercus velutina
Rhamnus cathartica
Rhus typhina
Salix spp.
Salix babbiana
Tilia americana
Tsuga canadensis
Ulmus spp.
Zanthoxylum americanum