

working version - some omissions (compass directions are in true compass (not magnetic) heading)

UPLAND FIELD SAMPLING PROTOCOL

Plot location: Plots will be randomly located using polar coordinates from a point of origin established at a prominent feature identified on the map. Plot locations will be rejected if they are: → the center, or the plot edge?

- (1) within 10 m of a road or track, or
- (2) within 15 m of the edge of the field, or
- (3) in an active research area.

Plot size: 200 m² circle (= 7.98 m radius)

Line transects: Cover of shrubs and tree stems > 1 m in height will be measured along four - 7.5 m long line transects oriented in random compass directions from the center of the plot. Successive transects must be separated by at least 30°. Creeping shrubs (e.g., some species of *Rubus*, poison ivy, etc.) will not be sampled along the line transects (they will be sampled in the herb quadrats instead).

NOTE: shrubs present somewhere in the 200 m² plot but not encountered along the line transects should be checked off on the data sheet as "present".

Herb quadrats: Cover of herbaceous species, creeping shrubs, rock, ^{v. litter and} bare soil, mosses, lichens and woody seedlings (stems < 1.0 m in height) will be recorded in two 1m x 0.5m rectangular quadrats located at random distances along each of the four line transects (total = 8 quadrats). The density of woody seedlings will also be recorded in each quadrat. Quadrats will be located with one long axis on the line transect, with the quadrat area to the clockwise side of the transect. Cover < 2% will be marked as + → unestimatable in most cases because the resolving betw/ 0 < x < 1 and x > 1 but < 2 is subject to inaccuracy

200 m² quadrats: Densities of saplings (tree stems > 1.0 m height and < 10 cm DBH) will be recorded by species and 2 cm DBH size classes (0-2 cm, 2-4 cm, etc.). Actual DBH of tree-sized stems (> 10 cm DBH) will be recorded, by species, individually. DBH of main stem will be measured for multiple-stemmed trunks of trees.

Herbaceous species list: Identifiable herbaceous species present anywhere in the 200 m² plot (but that were not present in the herb quadrats) will be recorded on the herb quadrat lists as simply "present".

Soil sampling: Cores from the top 10 cm of mineral soil will be collected at 5 randomly located points within the plot, and combined for a single aggregate sample.

Site description: The following information will be recorded for each plot:

- Slope (in degrees) if flat, then it will be marked < 5% (= no slope discernable)
Aspect (in degrees)
Slope position ("hilltop", "midslope", "lower slope" or "local depression")

Any comments on vegetation, environment and historical factors will also be recorded on the data sheets.

Cover = projected cover = % of ground surface covered by live plants
plants over hanging, but not growing in quadrat are counted for as much cover as they extend in, those hanging out of quadrats are also considered as much as they are ~~found~~ into the quadrat project

Taxonomic Notes

Carex sp. 2 = *C. complanata* s.l. (var. *hirsuta*)

Carex sp. 3 = *C. normalis* s.l.

Potentilla simplex or *Potentilla canadensis*

These species are virtually indistinguishable, and their taxonomy is only reliable if both spp. were present in a plot. Anything designated by either of these epithets probably should just be lumped all into *Potentilla Canadensis* for analysis

Solidago sp. 1 = basal rosette lvs of *Solidagos*, not bolting or flowering, so they are unidentifiable. At times, rosette lvs were distinct enough to ~~put~~ create another group (i.e. *S.* sp. 2, sect.) All these designations may be lumped if the O.T.U.'s are not considered reliable enough.

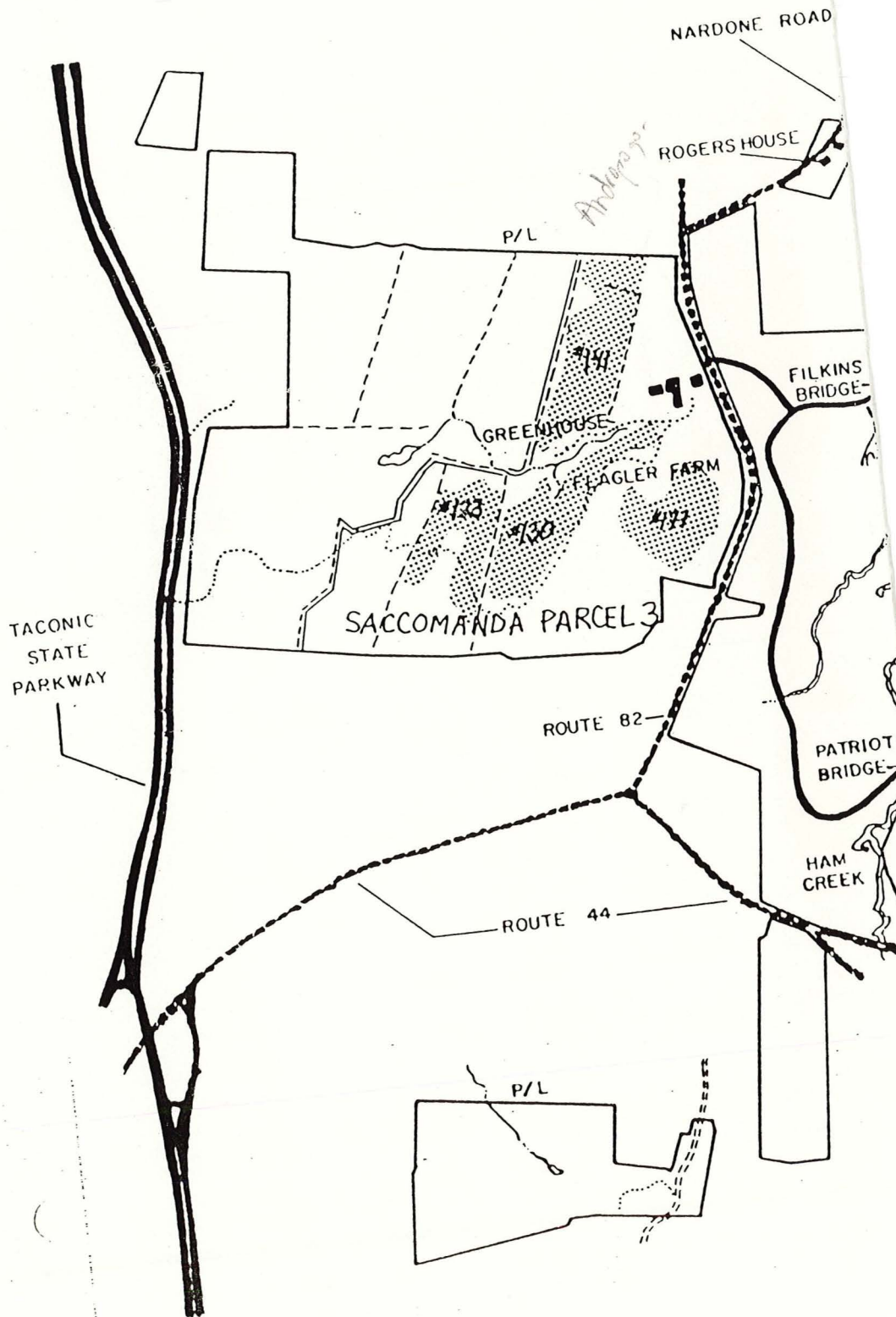
Solidago bicolor / *hispidula* - these are probably all *S. bicolor* since the other sp. is extremely rare around here. They could not be separated definitively, because the key character is yellow vs. cream-colored flowers. It is safe to call these all *S. bicolor*.

[KEY TO SOLIDAGOS IS INCLUDED]

Convolvulus sp - probably *C. spithameus*, but never flowered, so I can't say for sure.

"Barbarea" type was a basal rosette which turned out to be *Chrysanth.* (*leucanthemum*) - these were all changed on the data sheets, I think.

FIGURE 1. Distribution of the major upland fields with the Arboretum.



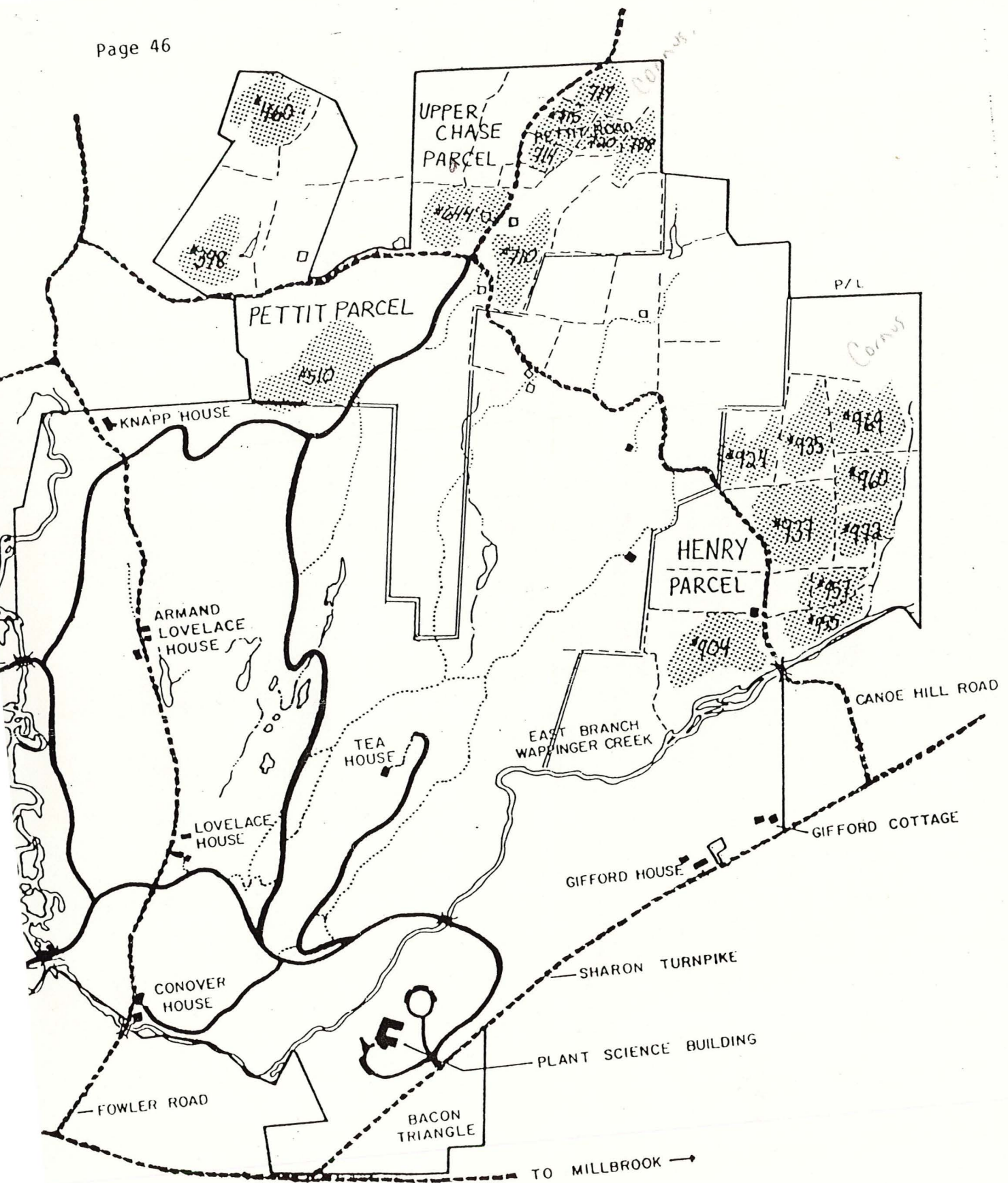


Table 1. A summary of the characteristics of 23 major upland fields of the Mary Flagler Cary Arboretum.

FIELD #	SIZE (HA)	SUBS- TRATE ¹	SOIL SERIES ²	FARM ³	AGRIC. USE	YEAR ABAND.	SUBSEQUENT USE ⁴	SHRUB COVER ⁵	TREE DENS. ⁵
123	3	T,O	H,W	S	Pasture (?)	late 30's	none	P	A
130	5	T		S	Pasture	1937	none	P	W
141	4	T,O	N,H	S	Pasture	1937	?	A	A
177	4	O	H	S	Pasture	1937	haying/mowing	R	R
398	2	O	H	P	Pasture	1939	mowed in '79	P	A
460	3	O	H	P	?	1939	none	W	P
510	4	O	H	P	?	1939	extensive	R	R
644	4	O	H	C	?	1932	mowed 1978-1982	P	P
710	3	T	N	C	Pasture	1932	slight	R	A
714	1	T	D	C	Pasture	1932	slight	A	A
715	1	T	D	C	?	1932	none	A	P
719	2	T	N	C	Orchard	1932	none	P	W
720	1	T	N	C	Pasture	1932	none	W	W
788	2	T	N,Pi	C	?	1932	none	P	W
904	3	T,O,A	N,H,Pa	H	Tilled	mid 30's	some tree cutting	A	W
924	3	T	N	H	Pasture	early 30's	slight	W	A
935	2	T	D	H	Pasture/Orch.	1932	mowed 1974-1980	P	W
937	6	T	D,Pi	H	Tilled	1932	mowed 1973-1982	A	W
955	3	T	D,Pa	H	Tilled	mid 30's	mowed 1978-1982	A	P
957	2	T	D	H	Pasture/Orch.	1937	slight	P	W
960	3	T	D	H	Tilled	early 30's	mowed 1973-1983	P	W
969	3	T	D,N	H	Pasture	early 30's	mowed 1973-1980	P	R
972	2	T	D	H	Tilled	1932	mowed 1973-1983	P	P

- ¹ T = glacial till, O = glacial outwash, A = alluvial sediments
² D = Dutchess, H = Hoosic, N = Nassau, Pa = Pawlet, Pi = Pittstown
³ S = Saccomanda, P = Pettit, C = Chase, H = Henry
⁴ see the individual field summaries for more detail
⁵ A = abundant, P = patchy, W = widespread but sparse, R = rare

FIGURE 2. Dendrogram of the classification of 40 upland field plots using TWINSpan. The major groups discussed in the text, as well as summaries of their characteristics, are also noted.

