

**SARATOGA NATIONAL HISTORICAL PARK
GRASSLAND BIRD STUDY
SUMMER 1995**

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BACKGROUND

In 1985, a Breeding Birds Atlas project was conducted in national parks of the northeastern United States to determine the status of species of special concern. Through this study, it was determined that the Henslow's Sparrow, Grasshopper Sparrow, and Northern Harrier breed in the Saratoga National Historical Park. The Grasslands Bird Study is being conducted in an effort to better understand the most appropriate methods of field management to best benefit grassland bird species. (Underwood 1993)

Vegetation sampling and bird surveys were conducted in the Saratoga National Historical Park from June 3, 1995 to August 25, 1995. The sampling of these fields will assist in the managerial decision-making process as it pertains to the preservation and maintenance of these historic fields. Due to the fact that birds of special concern breed in the park, the method and timing of field management must consider the breeding biology and habitat requirements of these birds.

The sampled fields have been subjected to various management regimes over the years. These include prescribed burning, mowing, grazing, and agriculture. Each field differs in the frequency, intensity, and type of management.

The following report includes a materials list, a description of the data collection process, the methodology employed, and an explanation of the data sheets for both the vegetation sampling and the bird surveys.

VEGETATION SAMPLING

MATERIALS

Meter square (made from four carsonite posts and four metal L brackets)

Meter stick

Threaded rod, 7mm diameter x 1 meter long (divided and numbered into ten equal parts)

PVC pipe, 1 1/4 inches diameter x 4 inches long

Hand compass

Abney level

Calipers

String, 1m long with a washer tied at each end

Zip-lock bags

Plant nomenclature was based on Gleason and Cronquist (1991).

METHODS

Plot Location

The vegetation of nineteen fields was sampled. Most fields were sampled with thirty plots. Due to their small size (under six acres), the Bemis Heights field and the two Bill Smith Road fields were sampled with only fifteen plots each. The plot points were given in the form of

a compass bearing and a distance (a number of paces to be walked). A list of random compass bearings and distances were generated by a computer program. A compass bearing and a distance were chosen from this list by selecting the numbers and crossing them off in exactly the order that they appeared. See Appendix A for such a list.

If in the course of traveling to one of the plots, the selected compass bearing and paces put the plot out of bounds, the back azimuth of the selected bearing was used. Out of bounds was defined as: into the brush or woods bordering the field, onto the shoulder of a road, or onto a mowed area. During the course of the study, fewer than ten plots fell out of bounds.

To begin the sampling of a field, the pacer stood in the center of the field, found a bearing with a hand compass, and using an immovable object as a sight, traversed the required number of paces along the bearing. To reduce site selection bias, the pacer focused on the landmark rather than the ground.

METER SQUARE PLACEMENT

After pacing the proper distance, the pacer would stop and place the meter square on the ground such that the bottom left corner touched the inside of the right big toe and the left side was in line with the landmark. The 1/5 meter section was always along the right outer edge of the plot, parallel to the sight line.

The 1/5 meter section of the meter square was isolated with a string which was set into place between two notches cut into the side of the meter square. It was only within this 1/5 meter that woody-stemmed plants were measured and their heights and diameters recorded.

LITTER DEPTH

This measurement was made using a meter stick and a piece of PVC pipe. The meter stick was randomly placed in the plot down to the soil surface. The PVC pipe was then slid over the top of the meter stick and allowed to fall to the top of the litter layer. Care was taken that no live vegetation was obstructing the pipe. The pipe was then squeezed against the meter stick and the depth of the litter was read from the bottom of the pipe.

DENSITY

This measurement was made using a piece of threaded rod approximately 7mm in diameter. The rod was marked into ten sections of ten centimeters each, as defined in Whitmore. (1981)

The measurements were taken by randomly dropping the rod to the soil surface perpendicular to the ground. The rod was then examined within each of its ten centimeter increments for "hits". A "hit" was defined as any live piece of vegetation touching any portion of the rod. The number of hits and the section of rod in which they occurred were recorded. Note that a single piece of vegetation is counted once for every time it touches the rod.

COVER

Cover is a percent estimate of the surface area covered by each genus within the meter square sample plot. The estimates of cover were based upon the Braun-Blanquet cover scale, shown below. (Causton 1988)

<u>RATING</u>	<u>DESCRIPTION</u>
0	sparsely, or very sparsely present; cover very small
1	plentiful, but of small cover value
2	very numerous, or cover 5-20%
3	any number of individuals; 25-50%
4	any number of individuals; 50-75%
5	cover greater than 75%

Each herbaceous genus in the plot was recorded and then assigned a number from the above scale. The easiest way to assign a cover value was to envision all of the individuals of a genus grouped together in one corner. The percentage of the plot covered by that genus could then be estimated and assigned a rating. Besides being assigned a rating based on how much area it covered in the meter square, each woody-stemmed genus was assigned a separate rating based on its percent cover in the 1/5 meter.

Note that cover for each genus, woody and herbaceous, was estimated based upon its own percent of cover within the meter square. Because the vegetation consists of many overlapping layers of canopy, the sum total of percent cover for a densely populated sample plot could well exceed 100%.

WOODY PLANTS

Within the 1/5 meter section of the meter square, each woody-stemmed individual was identified to the genus level and measured. Height was measured with a meter stick to the nearest 1/10 centimeter from the soil surface to the highest point on the plant. Using calipers, the basal diameter of each woody-stemmed individual was measured at the soil surface to the nearest 1/10 centimeter.

EXPLANATION OF THE DATA SHEET ENTRIES (APPENDIX B)

Field: Each field was assigned a number from the 1994 Saratoga National Historical Park Map.

Slope and Aspect: At each point, the slope and aspect of the terrain were measured in degrees. The slope was measured using an Abney level and the aspect was measured with the aid of a compass.

Herbaceous height: Using a meter stick, the tallest living herbaceous plant in the plot was measured at it's highest point to the nearest 1/10 centimeter.

Litter Depth: This measurement was determined with the use of a meter stick and a piece of PVC pipe, to the nearest 1/10 centimeter.

Density: This measurement was recorded by determining how many "hits" occurred in each section of the density rod.

Cover: This recording is comprised of four parts: first, within the meter square plot, each herbaceous plant was identified to the genus level and given a cover value based on the Braun-Blanquet scale. Next, each woody-stemmed genus located in the 1/5 meter was given a cover value based upon the same scale for how much area it covered in that section. Third, woody-stemmed genuses were given a cover for how much area they covered in the entire plot. Last, a ground cover value was assigned to the plot as a whole encompassing all vegetation in the meter square. Note: Leaf litter was considered cover. This value is a comparison of the amount of vegetative cover verses how much bare soil is visible. For example, if the plot was covered with 65% vegetation and 35% bare soil, the cover value would be assigned a "4". For this measurement, the sum total would equal 100%.

Herbs: Each herbaceous plant in the meter square was identified to the genus level and given a cover value from the Braun-Blanquet scale. See Appendix C for the plant list.

Woody-stems: Each woody-stemmed individual in the meter square was identified to the genus level. Within the 1/5 meter section, the height and diameter of each individual stem was measured to the nearest 1/10 centimeter using a meter stick and calipers. See Appendix C for the plant list.

Data Entry: The files were entered into two database files using dBASE III.

BIRD SURVEYS

MATERIALS

Binoculars

Tape Player

Tape of "Target" Grassland Bird Songs

Maps of Each Field to be Observed

FIELD OBSERVATIONS

Sixteen fields inside the park were surveyed using the "consecutive flush" method. (Delany et al. 1985) Two searchers, spread out about 50 meters apart and traversed the field. The searchers would frequently stop and listen, recording any located "target" birds on the map. (Appendix D) Date, time, wind, temperature, and humidity were also recorded. (See Appendix E for a list of "target" birds and the symbols used to record them and their behaviors.) At each stop, a tape of target bird songs was played and the observers would "spish". "Spishing" is a vocalization technique used by birders which elicits a response from territorial birds. Each of these fields were observed once a week for a period of eight weeks. About four fields were surveyed each day.

ROADSIDE SURVEYS

Several fields outside of the park boundaries were observed using techniques used in the Breeding Bird Survey. An automobile route was driven once a week for a period of eight weeks. The observers stood outside of the car and recorded any target birds heard within a three minute time span. Unlike the Breeding Bird Survey, tapes and spishing were employed. These observations were recorded on a data sheet. (Appendix F) Date, time, wind, humidity, and temperature were also recorded. The purpose of the roadside observations was to estimate the number of target birds nesting in the periphery of the park.

NIGHT SURVEYS

On two occasions, six searchers spent the night at Saratoga National Historical Park in order to monitor Henslow's Sparrow activity. Every thirty minutes, a pair of searchers visited each field that contained known Henslows' nests. There, they would listen for three minutes, following the procedures for roadside surveys. On both nights, Henslow's were heard singing in their territories. The purpose of these surveys was to determine whether or not Henslow's Sparrows sing all night.

DATA

After the eight weeks of observations were complete, the maps were separated by field and the number of territories for each species was estimated. A bird had to be recorded in the same area of the field three out of eight times in order for the area to be considered a territory. Sitings of less than that were attributed to transient and unmated birds. The number of territories and any relevant comments were recorded on a summary sheet. These sheets will be used to help analyze the data.

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Appendix A

19	13						
37	50	47	40	28	41	30	48
35	8						
21	33	22	9	44	14	26	27
2	38						
14	18	22	25	23	17	5	19
17	31						
27	42	36	43	41	38	44	10
22	28						
30	15	22	7	8	17	18	46
17	48						
12	40	20	15	29	8	8	3
22	47						

More Random Number Generation?: (Y or N, Then RETURN)

Command ||<A:>|| || ||

315	121	121	191	122	300	111	305
298	250						
318	104	44	205	34	275	182	223
169	244						
273	180	15	338	57	132	124	342
178	316						
146	224	15	67	273	128	209	342
156	22						
143	116	347	52	98	348	135	184
174	11						
74	204	293	64	173	78	196	202
265	313						
164	301	360	155	299	57	291	110
162	68						
67	145	214	28	240	45	16	175
102	138						
31	204	203	208	178	353	196	223
199	316						
271	329	15	331	79	131	88	93
173	137						

More Random Number Generation?: (Y or N, Then RETURN)

Command ||<A:>|| || ||

48	28	28	44	21	48	50	12
23	7						
41	19	16	12	28	36	40	46
12	8						
10	16	20	5	13	7	4	22
15	25						
39	30	3	3	29	23	44	49
48	24						
24	46	49	26	9	1	8	49
37	48						
28	41	23	45	33	19	5	23
27	31						
48	42	35	46	41	33	10	9
47	5						
27	41	6	40	38	38	33	47

DEBILITY

Dead Herbaceous (1/5m) _ _ _

VI _____
V2 _____
V3 _____
V4 _____
V5 _____
V6 _____
V7 _____
V8 _____
V9 _____
V10 _____

Ground Cover

-HERBS

HOODY

Genre Cover

Genus .

Cover

Height

Diameter

Blank lined page with horizontal ruling lines.

[illegible]

Appendix C

VEGETATION FOUND IN SARATOGA NATIONAL HISTORICAL PARK RESULTS OF SUMMER 1995 VEGETATION SAMPLING

GENUS	COMMON NAME
<i>Achillea</i>	Yarrow
<i>Agrimonia</i>	Agrimony
<i>Agropyron</i>	Couch Grass
<i>Agrostis</i>	Bent Grass
<i>Agrostis</i>	Red Top
<i>Ambrosia</i>	Ragweed
<i>Andropogon</i>	Blue Stem
<i>Anthoxanthum</i>	Sweet Vernal Grass
<i>Arctium</i>	Burdock
<i>Asclepias</i>	Milkweed
<i>Aster</i>	Aster
<i>Bromus</i>	Brome Grass
<i>Carex</i>	Carex
<i>Centaurea</i>	Knapweed
<i>Chrysanthemum</i>	Daisy
<i>Cichorium</i>	Chicory
<i>Cirsium</i>	Thistle
<i>Convolvulus</i>	Bindweed
<i>Dactylis</i>	Orchard Grass
<i>Danthonia</i>	Oat Grass
<i>Daucus</i>	Wild Carrot
<i>Elymus</i>	Wild Rye
<i>Erigeron</i>	Fleabane
<i>Equisetum</i>	Horsetail
<i>Eupatorium</i>	Boneset
<i>Festuca</i>	Fescue
<i>Fragaria</i>	Strawberry
<i>Galium</i>	Bedstraw
<i>Geum</i>	Avens

Appendix C (Continued)

<i>Hieracium</i>	Hawkweed
<i>Hypericum</i>	St. Johnswort
<i>Impomoea</i>	Morning Glory
<i>Inula</i>	Elecampane
<i>Juncus</i>	Rush
<i>Lamium</i>	Henbit
<i>Leptoloma</i>	Fall Witch Grass
<i>Linaria</i>	Butter and Eggs
<i>Lobelia</i>	Lobelia
<i>Lotus</i>	Birdsfoot Trefoil
<i>Lycopus</i>	Bugleweed
<i>Melilotus</i>	Sweet Clover
<i>Onoclea</i>	Sensitive Fern
<i>Oxalis</i>	Wood Sorrel
<i>Panicum</i>	Panic Grass
<i>Parthenocissus</i>	Virginia Creeper
<i>Penstemon</i>	Beardtongue
<i>Phalaris</i>	Canary Reed Grass
<i>Phleum</i>	Timothy
<i>Plantago</i>	Plantain
<i>Poa</i>	Fowl Meadow Grass
<i>Poa</i>	Kentucky Blue Grass
<i>Polygala</i>	Milkwort
<i>Potentilla</i>	Cinquefoil
<i>Prunella</i>	Heal-All
<i>Pycnanthemum</i>	Mountain Mint
<i>Ranunculus</i>	Buttercup
<i>Ranunculus</i>	Crowsfoot
<i>Rhus</i>	Poison Ivy
<i>Rosa</i>	Rose
<i>Rubus</i>	Blackberry
<i>Rudbeckia</i>	Coneflower
<i>Rumex</i>	Field Sorrel
<i>Sedum</i>	Live-forever
<i>Solanum</i>	Horse Nettle
<i>Solidago</i>	Goldenrod
<i>Stellaria</i>	Stichwort
<i>Taraxacum</i>	Dandelion

Appendix C (Continued)

<i>Thymus</i>	Thyme
<i>Trifolium</i>	Hop Clover
<i>Verbena</i>	Vervain
<i>Veronica</i>	Speedwell
<i>Vicia</i>	Vetch
<i>Vitis</i>	Grape

Woody-Stems

<i>Betula</i>	Birch
<i>Cornus</i>	Dogwood
<i>Crataegus</i>	Hawthorn
<i>Fraxinus</i>	Ash
<i>Populus</i>	Aspen
<i>Prunus</i>	Cherry
<i>Quercus</i>	Oak
<i>Rhamnus</i>	Buckthorn
<i>Spiraea</i>	Spiraea
<i>Ulmus</i>	Elm
<i>Viburnum</i>	Viburnum
<i>Xanthoxylum</i>	Ash

Buebird

7/13/95
715
70°
humid/calm

Intersects
with
Coto
in OS



Appendix E

TARGET BIRD SPECIES AND THEIR ABBREVIATIONS

<i>Ammodramus savannarum</i>	Grasshopper Sparrow (GS)
<i>Buteo jamaicensis</i>	Red-tailed Hawk (RTH)
<i>Carduelis tristis</i>	American Goldfinch (GF)
<i>Circus cyaneus</i>	Northern Harrier (No Ha)
<i>Dendroica discolor</i>	Prairie Warbler (PW)
<i>Dolichonyx oryzivorus</i>	Bobolink (B)
<i>Falco sparverius</i>	American Kestrel (K)
<i>Geothlypis trichas</i>	Common Yellowthroat (YT)
<i>Melospiza melodia</i>	Song Sparrow (SS)
<i>Passerculus sandwichensis</i>	Savannah Sparrow (Sav S)
<i>Passerherbulus henslowii</i>	Henslow's Sparrow (HS)
<i>Sialia sialis</i>	Eastern Bluebird (EB)
<i>Spizella pusilla</i>	Field Sparrow (FS)
<i>Sturnella magna</i>	Eastern Meadowlark (ML)
<i>Tyrannus tyrannus</i>	Eastern Kingbird (KB)
<i>Vermivora pinus</i>	Blue-winged Warbler (BW)

SYMBOLS

ⓗS	Henslow's singing
HS	Henslow's calling
HS	Henslow's persistently calling
HS	Henslow's flying
ⓗS → HS	Henslow's was singing than flew to new spot and is calling.
HS ⌢ EB	Tension between a Henslow's and a Bluebird
*	Nest
HS >	Henslow's perched on knapweed
HS T	Henslow's perched on goldenrod
HS ∩	Henslow's perched on shrub
HS ∪	Henslow's perched on tree
HS I	Henslow's perched on grass

Appendix F

Data Sheet for Outer Park Area

Date_____ Wind__ (none, light, med, strong) Temp__F Cloud Cover____%

Stop #	Mileage	Time	Descrip.	Management	Birds
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