

Bird Population Studies on  
Gypsy Moth Research Areas in the Northeast

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In 1984 a census of breeding birds was mandated by the Cooperative Gypsy Moth Program at four study areas in New York, Connecticut, Massachusetts, and Vermont, the last having been surveyed previously in 1979 and 1980 (Scharf and Smith 1986). Here I report findings for the 1984, 1985, and 1986 seasons. Future memoranda will cover important variations in distribution, by species and by foraging habit, among the study areas, compare results of the present study at Bryant Mt., Salisbury, VT to the earlier work at that location, and present the results of two surveys of over-wintering birds at Bryant Mt. in 1985 and 1986.

Methods

The census design was supplied by D. Capen (Capen 1984) and implemented on the four sites by P. Martin, who conducted the 1984 surveys. Rectangular sampling grids, which ranged from 12 ha at New York to 18 ha at Vermont, were staked out so as to blanket banded gypsy moth monitoring plots. Grid intersections were at 50 m intervals. The observer would walk slowly along a grid line, stop frequently, and double back on the adjacent parallel line until the entire grid was canvassed. The positions of all birds detected, either visually or by song or call, were recorded on a grid sheet for the day. The direction of the observer's progress through the grid was reversed each day. Surveys ordinarily began about .5 hr past dawn and lasted from

2.5 to 4 hr, depending on the terrain and the size of the plot. Surveying during rainy or windy weather was avoided.

A season's census consists of nine such surveys at each study area: three each in early May, early June, and early July. A species that turns up in at least three separate surveys in at least one sufficiently small cluster is considered to be breeding. The simultaneous detection of two or more singing males of a species is essential to the success of this method in habitats which are relatively well-packed, where conspecific clusters are otherwise impossible to distinguish.

The output of this procedure is a count of breeding pairs of each species detected at a study area. This interpretation is to a certain extent by convention. Factors such as polygyny and the presence of nest-helpers and other non-breeders or floaters will regulate the confidence with which the census count is projected as an accurate estimate of adult population density for the habitat being sampled. In addition, the territorial behavior of some species, e.g., blue jays and black-capped chickadees, is more refractory to interpretation by this method than that of birds more likely to "duel" with song, such as wood warblers and the thrushes. Counting becomes more difficult as the territory size typical of a species increases relative to grid size, regardless of the style of territorial display.

Each study area at some point harbors a number of migratory or otherwise transient birds. These birds are identified and counted during surveys, but numbers of transients of a species concurrently breeding at a site cannot be well estimated by this census method. The sampling of strictly migratory birds, as well, is unavoidably haphazard, although their activities during early gypsy moth larval development are of great interest.

### Results

Three-year census figures for all study areas are given in Table 1-7. Numbers are calculated (and rounded) per 100 ha to facilitate comparisons of densities among sites which differ in area.

Results for the Vermont study area are given for the site as a whole and for each (e.g., susceptible) zone. At New York, the susceptible zone is co-extensive with the entire plot sampled for 1984. In 1985 a census grid for the gypsy moth resistant sampling zone was laid out; this grid was surveyed in 1985 and 1986. Because of habitat constraints, the area (1.75 ha) of this grid is small and inadequate for good breeding estimates of most species occurring in the vicinity. In addition, since habitat on each edge of this grid grades abruptly into distinctly different ecotones, even small-territory species nesting within the grid are likely to be utilizing the complex and atypical habitat which surrounds it.

English names for birds in these tables conform in usage to the 1983 AOU Checklist (1983).

### References

- American Ornithologists' Union 1983. Check-List of North American Birds. 6th ed. Lawrence, KA. Allen Press.
- Capen, D. 1984. Bird population studies on gypsy moth research areas in the Northeast: Progress Report 1984.
- Scharf, C.S., and Smith, H.R. 1986. Avian diversity along an altitudinal and defoliation gradient in the Green Mountains of Vermont. (Unpublished MS).

Table 1. Breeding pairs of birds, by species, per 100 ha, at N. Stonington, CT, 1984-1986. Census grid size: 16 ha.

	1984	1985	1986
Northern flicker	0	0	9
Red-bellied woodpecker	3	6	6
Hairy woodpecker	13	19	13
Downy woodpecker	0	13	6
Great crested flycatcher	13	6	9
Eastern phoebe	6	13	3
Eastern wood-pewee	6	13	19
Blue jay	19	3	9
Black-capped chickadee	19	16	13
Tufted titmouse	19	9	16
White-breasted nuthatch	6	13	6
House wren	13	19	3
Gray catbird	0	6	3
Wood thrush	22	25	6
Hermit thrush	6	6	19
Veery	19	19	0
Eastern bluebird	6	0	0
Yellow-throated vireo	0	0	6
Red-eyed vireo	56	28	44
Black-and-white warbler	31	19	22
Worm-eating warbler	63	50	25
Blue-winged warbler	6	0	0
Cerulean warbler	3	0	0
Ovenbird	131	163	131
American redstart	13	0	0
Northern oriole	6	0	6
Brown-headed cowbird	6	6	13
Scarlet tanager	34	19	34
Rose-breasted grosbeak	13	0	0
Rufous-sided towhee	19	13	25
TOTAL	<u>551</u>	<u>484</u>	<u>446</u>

Table 2. Breeding pairs of birds, by species, per 100 ha, at Bourne, MA, 1984-1986. Census grid size: 16 ha.

	1984	1985	1986
Ruffed grouse	0	6	6
Northern bobwhite	0	6	0
Mourning dove	0	0	6
Northern flicker	6	6	9
Hairy woodpecker	6	0	0
Downy woodpecker	6	6	0
Great crested flycatcher	6	0	0
Eastern wood-pewee	0	0	6
Blue jay	13	13	13
Black-capped chickadee	25	16	13
Tufted titmouse	0	13	9
Brown creeper	6	0	0
American robin	31	13	13
Hermit thrush	31	19	16
Black-and-white warbler	0	0	6
Pine warbler	28	13	25
Ovenbird	44	53	56
Common yellowthroat	6	0	6
Northern oriole	13	6	6
Brown-headed cowbird	6	0	6
Scarlet tanager	0	3	13
Rufous-sided towhee	84	91	63
TOTAL	311	264	272

Table 3. Breeding pairs of birds, by species, per 100 ha, at Cornwall-on-the-Hudson, NY, 1984-1986. Census grid size: 12 ha, susceptible zone.

	1984	1985	1986
Ruffed grouse	0	0	4
Mourning dove	8	8	8
Northern flicker	0	8	8
Hairy woodpecker	13	8	8
Downy woodpecker	8	17	8
Great crested flycatcher	33	17	25
Eastern phoebe	0	0	8
Eastern wood-pewee	25	17	17
Blue jay	25	17	17
Black-capped chickadee	17	4	17
Tufted titmouse	8	8	0
White-breasted nuthatch	17	17	8
American robin	83	21	21
Wood thrush	67	42	13
Veery	0	8	0
Yellow-throated vireo	8	0	0
Solitary vireo	8	13	0
Red-eyed vireo	33	21	13
Black-and-white warbler	83	54	42
Worm-eating warbler	38	13	8
Ovenbird	83	50	29
Louisiana waterthrush	4	0	0
American redstart	4	8	4
Scarlet tanager	42	21	13
Rose-breasted grosbeak	17	25	8
Rufous-sided towhee	83	67	42
TOTAL	<u>707</u>	<u>464</u>	<u>321</u>

Table 4. Breeding pairs of birds, by species, per 100 ha, at Salisbury, VT, 1984-1986. Census grid size: 18 ha.

	1984	1985	1986
Ruffed grouse	8	6	0
Mourning dove	0	6	0
Ruby-throated hummingbird	6	6	0
Northern flicker	6	8	8
Yellow-bellied sapsucker	11	6	6
Hairy woodpecker	6	6	11
Downy woodpecker	8	6	6
Great-crested flycatcher	39	19	28
Eastern wood-pewee	11	11	11
Blue jay	11	11	11
Black-capped chickadee	8	6	11
Tufted titmouse	0	0	3
White-breasted nuthatch	11	11	6
American robin	14	3	6
Wood thrush	17	19	11
Hermit thrush	33	17	22
Veery	47	19	39
Yellow-throated vireo	0	6	0
Solitary vireo	6	0	0
Red-eyed vireo	58	50	31
Black-and-white warbler	50	28	42
Black-throated blue warbler	22	28	36
Chestnut-sided warbler	31	25	22
Ovenbird	44	72	78
Mourning warbler	17	11	14
Canada warbler	6	0	0
American redstart	22	42	36
Northern oriole	0	3	0
Brown-headed cowbird	6	3	0
Scarlet tanager	33	17	22
Rose-breasted grosbeak	25	6	11
Indigo bunting	11	22	11
Dark-eyed junco	92	36	28
TOTAL	659	509	510

Table 5. Breeding pairs of birds, by species, per 100 ha, at Salisbury, VT, 1984-1986. Census grid size: 3.25 ha, resistant zone.

	1984	1985	1986
Ruffed grouse	15	0	0
Ruby-throated hummingbird	15	15	0
Yellow-bellied sapsucker	31	0	0
Hairy woodpecker	0	15	15
Downy woodpecker	0	0	15
Great-crested flycatcher	0	31	15
Eastern pewee	15	15	15
Blue jay	15	15	0
Black-capped chickadee	0	0	15
White-breasted nuthatch	15	15	0
American robin	31	15	0
Wood thrush	31	62	46
Veery	77	46	62
Solitary vireo	31	0	0
Red-eyed vireo	62	108	31
Black-and-white warbler	31	0	0
Black-throated blue warbler	62	31	31
Chestnut-sided warbler	31	46	46
Ovenbird	92	123	108
Mourning warbler	31	15	0
American redstart	46	62	62
Brown-headed cowbird	0	15	0
Scarlet tanager	62	31	15
Rose-breasted grosbeak	46	0	0
Indigo bunting	15	15	15
TOTAL	<u>754</u>	<u>675</u>	<u>491</u>



Table 6. Breeding pairs of birds, by species, per 100 ha, at Salisbury, VT, 1984-1986. Census grid size: 3.75 ha, transitional zone.

	1984	1985	1986
Northern flicker	13	0	0
Great crested flycatcher	27	13	13
Eastern wood-pewee	13	13	13
Blue jay	13	13	27
Black-capped chickadee	13	13	13
White-breasted nuthatch	13	13	0
American robin	27	0	0
Wood thrush	13	0	0
Hermit thrush	53	13	13
Veery	27	0	27
Red-eyed vireo	93	53	27
Black-and-white warbler	80	53	53
Black-throated blue warbler	0	13	40
Chesnut-sided warbler	0	27	0
Ovenbird	40	53	53
Mourning warbler	13	0	0
Canada warbler	27	0	0
American redstart	13	27	0
Scarlet tanager	53	27	40
Rose-breasted grosbeak	27	0	13
Dark-eyed junco	80	27	0
TOTAL	<u>638</u>	<u>358</u>	<u>332</u>

Table 7. Breeding pairs of birds, by species, per 100 ha, at Salisbury, VT, 1984-1986. Census grid size: 11 ha, susceptible zone.

	1984	1985	1986
Ruffed grouse	9	9	0
Mourning dove	0	9	0
Ruby-throated hummingbird	5	5	0
Northern flicker	5	14	14
Yellow-bellied sapsucker	9	9	9
Hairy woodpecker	9	5	14
Downy woodpecker	14	9	5
Great crested flycatcher	55	18	36
Eastern wood-pewee	9	9	9
Blue jay	9	9	9
Black-capped chickadee	9	5	9
Tufted titmouse	0	0	5
White-breasted nuthatch	9	9	9
American robin	5	0	9
Wood thrush	14	14	5
Hermit thrush	36	23	32
Veery	45	18	36
Yellow-throated vireo	0	9	0
Red-eyed vireo	45	32	32
Black-and-white warbler	45	27	50
Black-throated blue warbler	18	32	36
Chestnut-sided warbler	41	18	23
Ovenbird	32	64	77
Mourning warbler	14	14	23
American redstart	18	41	41
Northern oriole	0	5	0
Brown-headed cowbird	9	0	0
Scarlet tanager	18	9	18
Rose-breasted grosbeak	18	9	14
Indigo bunting	14	32	14
Dark-eyed junco	123	50	45
TOTAL	637	507	574

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