

# Fortieth Breeding Bird Census

*Edited by Willet T. Van Velzen\**

Once again, following the trend of the past few years, a record number of Breeding Bird Census reports was received, just edging out, by five, the all-time 1975 high of 165. These reports came in from 31 states and provinces. Colorado led with 23, followed by California (19) and New York (14). Well over half (55%) of the census reports were for new studies, representing an excellent spectrum of habitat types, many of which have never been studied before.

During recent years we have attempted to "incite" responses from our census-takers concerning various interesting questions that have arisen, with the feeling that many workers, especially long-time veterans of census-taking, might have deeper insights into these problems than we do. Unfortunately, little comment has been received. One point, however, that has been raised by several workers concerns the *Visitor* category in the reports. Recently, partially because of space limitations and partly because many reports simply give long lists of birds seen or heard anywhere on, over or near the plot, this section has often been deleted. In some cases, however, these "visitors" are a meaningful addition to the report, since they represent species that may sometime breed or may have bred on the Census plot. The *author*, of course, not the *editor*, should be in the best position to decide which species are important in this category, but in the censuses that follow, the editor has made the decisions (with, admittedly, considerable inconsistency). Some census-takers, who feel that their long lists of migrants are valuable additions to the report for other reasons, will probably be disappointed to find them missing. Admittedly, we are not yet adamant in our stand on this point and occasionally we can be swayed!

Another point of considerable interest, is that of how a census plot should be selected. In spite of our past words of guidance, probably no area represents greater variability than that of selecting the habitat and setting up the plot. The following pertinent remarks were received from one of our

most faithful census-takers. A. H. Claugus of Carey, Ohio, whose census efforts, nearly uninterrupted, span almost 40 years.

"When I began to examine bird populations, it became increasingly clear that there was a great need for more census efforts in all habitats wherever they were found, regardless of their nature or appeal to the census-taker. Since 1937, at least, many researchers have believed or were encouraged to believe, that uniformity of habitat selection in census work was more useful and more reliable for statistical interpretation. This was and is a worthy point of view, but as a census-taker of long standing I think adherence to uniformity should be modified so that an equal effort is given to census habitats which are not uniform in structure. It is here that I wish to enlarge upon the concept of censusing non-uniform habitats. The intensity of this notion has been growing with each yearly summary of continental census results.

I am presently engaged in tabulating all of Ohio's Breeding Bird Censuses. Most of Ohio is not covered with extensive wooded areas (22 unglaciated counties have most of this type of habitat). Consequently, edge effect is a major factor in bird populations since what woodland areas remain in the other 66 counties are small farm woodlots, along streams, or in metropolitan parks. Even such edges as exist between road and field, meadow and cropfield, ditch and meadow, railroad and numerous habitats, provide a massive mosaic of "edge effects", all contributing to the present densities of Ohio's birds. I recognize the value of censusing uniform habitats because it does make the interpretation of data easier and perhaps more significant for those areas. Yet, such data presents numerous difficulties to compilers in an interpretation of the bird-life of agricultural, urban, and rural communities. I am, therefore, highly concerned with the "overemphasis" on censusing uniform habitats. We do need more of them. But we also need many more "edge effect" counts. We need intensive efforts in croplands (only a few reported in *AFN* and *AB*). Add to these a need for linear counts, for much of the countryside has taken on such an aspect: railroads, power lines, conveyor belts, superhighways, streams with narrow borders, canals, drainage ditches, fences and

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hedgerows (rapidly disappearing), windbreaks, and water-land contacts. Uniformity of habitat seems destined to decrease as human pressure increases, demands for resources become greater, and environmental degradation in general continues. All this would seem to point to more and more intensive creation of "edge-acres," a term under consideration and development. As uniform habitats tend to decrease it is even more desirable to have census data so that we can know "how

it was." But more and more people will be living in "what it will be," and for this reason I believe that emphasis should shift from the values of uniformity to those of diversification of habitats."

Sincere appreciation is extended to the many workers this year who made a special effort to prepare their manuscripts carefully and submit them to meet the publication deadline.

### List of Censuses

Habitat	State or Province	Hec-tares	Pairs per sq. km.	Hrs. Obs.	Spe-cies	Yrs of Study
<b>A. Eastern — Deciduous Forest</b>						
1 Birch — Maple — Oak Forest	Connecticut	13.9	639	26	39	1
2 Second-growth Hardwood Forest	Connecticut	10.1	807	35	38	10
3 Mixed Hardwoods	New York	13.0	332	23	19	1
		13.0	394	21	18	2
4 Mixed Hardwoods Forest	New York	7.7	865	27	18	1
5 Mixed Upland Forest	New York	142.0	362	75	66	2
6 Upland Oak Forest	New York	11.8	497	30	11	4
7 Young Red Maple — Gray Birch Forest	New York	8.1	1347	10	21	1
8 Young White Ash — Basswood Forest	New York	8.1	1804	10	28	1
9 Birch — Maple — Oak Forest	Pennsylvania	9.0	574	31	32	3
10 Xurned Disturbed Upland Oak Forest	Pennsylvania	9.7	185	8	18	1
11 Disturbed Upland Oak Forest	Pennsylvania	10.1	430	16	23	2
12 Mountain Top, Oak — Maple Forest	Pennsylvania	6.1	404	12	19	3
13 Oak — Maple Forest	Pennsylvania	8.7	444	24	27	1
14 Stream Valley — Mixed Mesophytic Forest	Pennsylvania	16.5	630	28	42	1
		16.5	615	41	40	2
15 Brushy Ridge	West Virginia	6.1	338	12	16	1
16 Elm — Cherry Woodland	West Virginia	4.1	914	15	32	5
17 Maple — Oak — Hickory Forest	West Virginia	6.1	610	10	25	1
18 Mature Northern Hardwoods	West Virginia	12.1	634	20	35	4
19 Oak — Beech — Tulip-tree Forest	West Virginia	6.1	346	12	17	1
20 Oak — Beech — Tulip-tree Forest	West Virginia	6.1	733	18	32	5
21 Oak — Maple Forest	West Virginia	6.1	708	18	24	1
22 Oak — Maple — Hickory Forest	West Virginia	6.1	610	18	37	1
23 Riverside — Birch — Oak Forest	West Virginia	6.1	667	12	18	1
24 Deciduous Forest with Pond and Brook	New Jersey	16.7	269	12	31	13
25 Hickory — Oak — Ash Floodplain Forest	Maryland	18.4	978	26	44	5
26 Mature Deciduous Floodplain Forest	Maryland	7.6	870	28	21	24
27 Mixed Hardwood Forest	Maryland	11.3	1721	36	38	16
28 Upland Tulip-tree — Maple — Oak Forest	Maryland	12.0	760	17	34	6
29 Mixed Upland Habitat	District of Columbia	14.2	1296	106	28	17
30 Coastal Disturbed Floodplain	Virginia	8.1	247	23	36	1
31 Upland Oak — Hickory Forest	Virginia	11.0	650	52	21	4
32 Upland Tulip-tree — Oak Forest	Virginia	20.6	301	44	23	3
33 Mixed Deciduous Forest	North Carolina	12.6	705	28	28	1
34 Mixed Deciduous Forest	North Carolina	8.8	635	18	22	4
35 Upland Mixed Forest	North Carolina	15.0	374	14	22	23
36 Mountain Ravine Mixed Forest	Georgia	5.9	916	65	26	8
37 Mixed Hardwood Forest	Ontario	10.1	410	18	44	1
38 Wooded City Ravine	Ontario	20.0	245	16	19	7
39 Mature Mixed Hardwood Forest	Michigan	9.3	945	25	33	3
40 Oak — Hickory — Maple Forest	Illinois	13.0	309	12	26	1
41 Oak — Maple Forest and Edge	Illinois	22.3	216	43	13	44
42 Upland Deciduous Forest	Illinois	6.2	756	12	25	1
43 Black Oak — Sassafras Woods	Indiana	22.2	302	51	67	3

Habitat	State or Province	Hec-tares	Pairs per sq. km.	Hrs. Obs.	Species	Yrs. of Study
44. Pin Oak Forest	Indiana	6.9	225	8	12	1
45. Mixed Hardwood Regenerating	Ohio	20.2	455	28	34	1
46. Mixed Mesophytic Forest	Ohio	101.2	89	40	43	1
47. Virgin Beech — Maple Forest I	Ohio	6.1	1474	57	33	4
48. Virgin Beech — Maple Forest II	Ohio	6.1	1153	28	25	1
49. Maple — Gum — Hickory Forest	Tennessee	20.0	953	30	32	1
50. Mixed — Mesophytic Hardwoods	Alabama	15.8	336	21	24	1
51. Floodplain Forest: Dredged Material Disposal Site	Louisiana	7.7	1259	40	20	1
52. Virgin Scrub Oak Foothills	Oklahoma	16.2	312	26	30	2
<b>B. Eastern — Coniferous-Deciduous (Mixed)</b>						
53. Mixed Deciduous — Coniferous Forest	Maine	10.4	898	35	26	1
		10.4	560	18	26	2
54. Deciduous — Coniferous Second-growth Northwoods	Vermont	15.0	257	21	23	5
55. Burned Pine — Oak Forest	Massachusetts	22.5	220	54	20	2
56. Deciduous — Coniferous Low-lying Island	Massachusetts	5.1	395	32	13	2
57. Maple — Pine — Oak Second-growth Forest	Massachusetts	11.8	465	66	29	1
58. Pitch Pine — Scrub Oak Forest	Massachusetts	7.5	500	40	22	1
59. Climax Hemlock — White Pine Forest, with Transition Hardwoods	Connecticut	10.5	699	24	36	10
60. Upland Mixed Pine — Spruce — Hardwood Plantation	New York	16.6	645	22	34	3
61. Hemlock — Black Ash Swamp	Pennsylvania	8.1	618	49	19	1
62. Mountain Top, Mixed Hardwood and White Pine Forest	Pennsylvania	6.1	560	20	23	3
63. Coastal Mixed Pine — Oak Forest	North Carolina	19.2	427	79	24	4
64. Tamarack Bog and Hardwood	Michigan	8.5	235	14	16	1
65. Mixed Pine — Hardwood Forest	Texas	6.3	634	10	13	3
<b>C. Eastern — Coniferous</b>						
66. Coniferous Forest	Vermont	13.1	604	57	25	1
67. Scotch Pine Plantation	New York	5.3	190	12	9	2
68. Upland Scotch Pine Plantation	New York	9.3	1128	23	23	8
69. Red Pine — White Pine Forest	Ontario	8.7	446	38	22	1
70. Black Spruce — Tamarack Bog I	Michigan	5.9	532	78	21	1
71. Black Spruce — Tamarack Bog II	Michigan	6.2	578	81	21	1
72. Semi-open Black Spruce Bog	Michigan	6.7	238	55	19	1
<b>D. Eastern — Mixed Habitats</b>						
73. Mixed Upland Habitat and Swamp	Connecticut	14.2	900	38	34	9
74. Oak — Hemlock Forest, Semi-open Fields and Shrubland	Connecticut	23.1	392	58	27	11
		6.5	629	17	23	11
75. Upland Brushy Pasture	Connecticut	8.5	935	25	34	10
76. Shrub Community I	New York	9.3	892	15	15	2
77. Shrub Community II	New York	8.9	505	15	16	2
78. Mountain Top Bog with Mixed Hardwood and Evergreen Edge	Pennsylvania	6.1	544	13	27	3
79. Old Field — Meadow and Primary Deciduous Thickets	Pennsylvania	10.1	509	45	23	3
80. Brushy Hillside	West Virginia	6.1	906	29	38	1
81. Abandoned Railroad	Ohio	8.6	967	40	35	1
82. Disturbed Oak — Hickory Forest, Pine Stand, Edge, and Pond	Ohio	14.2	642	40	39	38
83. Mixed Habitat	Ohio	28.3	431	27	50	19
84. Old Field with Brush Patches	Indiana	17.0	763	33	39	1
85. Deciduous Clearcut	Tennessee	20.2	158	7	14	2
86. Roadside: Dredged Material Disposal Site	Louisiana	7.2	925	16	23	1
<b>E. Central — Prairie</b>						
87. Kentucky Blue Grass Prairie	North Dakota	4.8	103	3	7	5
88. Mixed Prairie (I)	North Dakota	10.0	345	8	23	5

Habitat	State or Province	Hec-tares	Pairs per sq. km.	Hrs. Obs.	Species	Yrs of Study
89. Mixed Prairie (II)	North Dakota	6.1	156	4	10	5
90. Mixed Prairie (III)	North Dakota	6.1	131	6	8	5
91. Mixed Prairie (IV)	North Dakota	6.1	49	4	5	5
92. Mixed Prairie (V)	North Dakota	6.1	41	3	8	5
93. Disturbed Mixed Prairie	Illinois	16.0	382	65	31	2
<b>F. Central — Great Plains</b>						
94. Mixed Prairie (I)	Colorado	8.1	37	6	3	1
95. Mixed Prairie (II)	Colorado	8.1	68	6	3	1
96. Three-awn Grassland — Prairie Dog Town	Colorado	8.1	80	5	5	1
97. Rubber Rabbitbrush — Grassland	Colorado	8.1	204	10	6	1
98. Sand Sagebrush — Grassland	Colorado	8.1	99	9	5	1
99. Sand Dropseed — Needle-and-thread Grassland	Colorado	8.1	31	5	4	1
100. Sand Dropseed Grassland (I)	Colorado	8.1	117	8	5	1
101. Sand Dropseed Grassland (II)	Colorado	8.1	49	6	3	1
102. Seeded Grassland (I)	Colorado	8.1	37	5	3	1
103. Seeded Grassland (II)	Colorado	8.1	154	8	6	1
104. Weedy Field (I)	Colorado	8.1	49	6	6	1
105. Weedy Field (II)	Colorado	8.1	25	4	2	1
106. Weedy Field (III)	Colorado	8.1	99	8	5	1
107. Weedy Field (IV)	Colorado	8.1	68	7	7	1
108. Weedy Field — Prairie Dog Town	Colorado	8.1	25	5	3	1
<b>G. Central — Disturbed Habitats</b>						
109. Mixed Habitat — Disturbed Bottomland	Oklahoma	40.5	316	38	42	5
110. Coastal Prairie: Dredged Material Disposal Site	Texas	11.9	395	22	5	1
<b>H. Western — Deciduous</b>						
111. Disturbed Riparian Stream Border	California	6.4	1322	76	20	2
		6.4	1165	23	24	3
112. Insular Scrub Oak Woodland	California	4.3	639	15	10	1
113. Sycamore — Coast Live Oak — Riparian Woodland	California	6.8	1294	62	31	1
114. Maple Thicket	Utah	4.9	927	53	7	2
115. Floodplain Cottonwood Forest	Colorado	52.2	282	18	28	4
116. Floodplain Cottonwood Forest	Colorado	9.7	1436	23	25	6
117. Reservoir Shoreline Cottonwood Forest	Colorado	29.0	391	24	25	2
<b>I. Western — Coniferous-Deciduous (Mixed)</b>						
118. California-Bay — Bishop Pine — Mixed Forest	California	11.7	592	21	26	5
119. Open Aspen Grove — Scattered Conifers	Colorado	14.0	528	23	37	1
120. Ponderosa Pine — Scrub Oak — Mountain Mahogany Woodland	Colorado	8.1	247	44	6	9
<b>J. Western — Coniferous</b>						
121. Logged Douglas-Fir — Reseeded with Monterey Pine	California	8.2	1083	24	31	5
122. Ponderosa Pine Forest	Colorado	8.1	655	25	13	13
<b>K. Western — Mixed Habitats</b>						
123. Mixed Habitat: Dredged Material Island	Oregon	12.1	597	27	17	1
124. Scattered Mixed Coniferous Forest in Subalpine Meadows and Spruce Bogs	Oregon	32.4	229	42	18	4
125. Catclaw — Rabbitbrush Desert Wash	California	17.8	275	17	12	1
126. City Park	California	6.7	404	36	6	1
127. Coastal Sand Dunes	California	15.0	427	24	9	1
128. Creosote — Burrobush Desert Scrub	California	17.8	17	11	2	1
129. Desert Riparian	California	6.6	2158	32	13	1

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs. Obs.	Species	Yrs of Study
130. Urban Nature Center	California	7.3	1414	16	19	1
131. Urban Nature Center I	California	17.0	400	19	19	1
132. Urban Nature Center II	California	17.4	494	19	17	1
133. Urban Park	California	6.3	1835	30	19	1
134. Farm with Ponds	Utah	10.5	1098	44	39	1
135. Cottonwood Riverbottom	Colorado	71.6	208	29	30	4
<b>L. Northern — Taiga and Tundra</b>						
136. Subarctic Taiga: Lowland Black Spruce Forest and Muskeg	Alaska	10.0	235	40	12	1
137. Subarctic Taiga: Lowland Seral Birch — Willow	Alaska	10.0	570	36	16	1
138. Subarctic Taiga: Lowland Tall Shrubs	Alaska	10.0	580	36	17	1
139. Subarctic Taiga: Lowland Tussock — Low Shrub Bog	Alaska	10.0	235	36	7	1
140. Subarctic Taiga: Lowland White Spruce — Paper Birch Forest	Alaska	10.0	285	36	21	1
141. Wet Coastal Plain Tundra (I)	Alaska	33.0	167	32	13	2
142. Wet Coastal Plain Tundra (II)	Alaska	27.0	148	32	15	2
<b>M. Wetlands</b>						
143. Shrubby Swamp and Sedge Hummocks	Connecticut	8.1	2212	48	22	10
144. Everglades Marsh	Florida	44.6	96	68	13	1
145. Cattail Marsh	Ontario	2.8	4312	30	5	1
146. Cattail Marsh I	Illinois	5.9	601	8	8	1
147. Cattail Marsh II	Illinois	1.6	950	5	4	1
148. Bulrush and Cattail Marsh in Conifer Forest	Montana	40.5	684	52	65	1
		40.5	729	72	66	2
149. Floodplain Pond	Colorado	8.5	577	5	8	3
150. Diked Coastal Salt Marsh	California	10.5	314	20	5	1
151. Freshwater Marsh — Riparian Woodland	California	9.3	784	24	31	1
<b>N. Fields and Cultivated Areas</b>						
152. Open Field	New York	13.0	344	14	9	2
153. Vineyard III	New York	4.1	222	9	5	1
		4.1	284	9	4	2
154. Vineyard IV	New York	5.3	209	8	8	1
155. Old Field	Pennsylvania	7.1	548	9	18	3
156. Abandoned Field	Maryland	6.1	379	23	13	5
157. Abandoned Turf Field	Maryland	6.3	222	4	5	2
158. Grassland	North Carolina	40.5	69	25	17	14
159. Blue Grass — Timothy — Clover Old Pasture	Illinois	14.2	169	8	6	1
160. Grass — Sedge Meadow	Illinois	5.9	482	8	9	1
161. Orchard Grass — Tall Fescue Meadow	Illinois	12.1	255	7	5	1
162. Advanced Old Field	Indiana	8.5	218	8	8	1
163. Annual Grassland	California	8.1	136	20	4	1
164. Dry Grass Field	California	13.3	30	15	1	1
165. Urban Grass Field	California	46.5	39	16	4	1
<b>O. Residential</b>						
166. Urban Residential	New Jersey	8.9	646	10	12	1
167. Urban Residential	Ontario	53.0	278	30	17	1
168. Village Residential	Ohio	13.0	587	113	20	1
<b>P. Censuses referred to by Whitcomb <i>et al.</i>, p. 17.</b>						
169. Mature Tulip-tree — Oak Forest	Maryland	14.6	1055	31	27	1
		14.6	870	24	24	2
170. Selectively Logged Mature Tulip-tree — Oak Forest	Maryland	14.2	1169	31	36	1
		14.2	1179	33	33	2

**1. BIRCH-MAPLE-OAK FOREST.** — **Location:** Connecticut; New London Co., 1 mile NNW of intersection of State Routes 161 and 156; 72°12'N, 41°20'W, Niantic Quadrangle, USGS. **Continuity:** 13.94 ha = 34.44 acres (rectangular, measured with steel tape and compass). **Description of Plot:** The dominant canopy trees are Yellow Birch (*Betula lutea*), N. Red Oak (*Quercus rubra*), Chestnut Oak (*Q. prinus*), Red Maple (*Acer rubrum*). Most prominent in the understory are Mountain Laurel (*Kalmia latifolia*) and Spicebush (*Lindera benzoin*), which was restricted to wetter habitats. The ground cover is primarily various types of ferns and mosses with some Poison Ivy (*Rhus radicans*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on five 0.1 acre circular samples, 228/acre; total basal area 163.8 square feet/acre. Species comprising 90% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): N. Red Oak, 50, 22, 39, 100; Yellow Birch, 48, 21, 11, 100; Red Maple, 46, 20, 17, 100; Chestnut Oak, 28, 12, 15, 60; Am. Beech (*Fagus grandifolia*), 14, 6, 2, 80; Tulip-tree (*Liriodendron tulipifera*), 12, 5, 8, 40; Black Birch (*B. lenta*), 10, 4, 5, 40; dead trees, 8, 4, 2, 60; Pignut Hickory (*Carya glabra*), 6, 3, 1, 60; Flowering Dogwood (*Cornus florida*), 6, 3, 5, 40. Trees by diameter size class (figures after each give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (3-6 in.) 60, 26, 6, 4, B (6-9 in.) 54, 24, 15, 9; C (9-15 in.) 76, 33, 60.8, 37; D (15-21 in.) 34, 15, 61.2, 37; F (27-33 in.) 4, 2, 19.6, 12. Shrub stems/acre 59,600; ground cover 63%; canopy cover 95%; average canopy height 94 ft (range 50-120). **Edge:** Bordered on S by pond, on N by similar habitat, on E and W by deciduous saplings recovering from 1961 forest fire. **Topography:** A ravine with a stream running from N to S that flows into Clark Pond at the S end of the plot. The census area is about 30% rock outcroppings. **Elevation:** 40 to 150 ft. **Coverage:** April 24; May 1, 8, 11, 21-23, 29; June 4; between 0500 and 1030 hours. Total man-hours: 26. **Census:** Gray Catbird, 7 (50, 20); House Wren, 6 (43, 17); Rufous-sided Towhee, 6; Veery, 5 (36, 15), Canada Warbler, 5; Black-and-white Warbler, 4 (29, 12), Com. Flicker, 3 (22, 9); Black-capped Chickadee, 3; Wood Thrush, 3; Blue-winged Warbler, 3; Ovenbird, 3; Brown-headed Cowbird, 3 (females); Great Crested Flycatcher, 2; E. Phoebe, 2; Blue Jay, 2; Tufted Titmouse, 2; Brown Thrasher, 2; White-eyed Vireo, 2; Red-eyed Vireo, 2; Worm-eating Warbler, 2; Com. Yellowthroat, 2; Hooded Warbler, 2; Am. Redstart, 2; N. Oriole, 2; Cardinal, 2; Ruffed Grouse, 1; Ruby-throated Hummingbird, 1 (female); Hairy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Red-winged Blackbird, 1; Scarlet Tanager, 1; Dark-eyed Junco, 1; White-throated Sparrow, 1; Downy Woodpecker, +; Brown Creeper, +; Am. Robin, +; Louisiana Waterthrush, +; Rose-breasted Grosbeak, +. **Total:** 39 species; 89 territorial males or females (639/km<sup>2</sup>, 258/100 acres). **Remarks:** Nests found: Wood Thrush, 2; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Gray Catbird, 1; Worm-eating Warbler, 1; Dark-eyed Junco, 1. Special thanks to Steven Dasinger for helping survey the plot and doing part of the quantitative habitat description. — *ANDREW and BRUCE DASINGER, 12 Stone Cliffe Dr., Niantic, Conn., 06357.*

**2. SECOND-GROWTH HARDWOOD FOREST.** — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris, 41°42'25"N, 73°12'22"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965, 10 intermittent years. **Size:** 10.1 ha = 25 acres (roughly rectangular). **Description of Plot:** See AFN 19: 590-591 (1965). **Coverage:** May 23-24; June 5, 8-9, 12; between 0445 and 2300 hours. Total man-hours: 35. **Census:** Red-eyed Vireo, 9 (89, 36); Ovenbird, 8 (79, 32); Veery, 7 (69, 28); Am. Redstart, 5 (49, 20); Rufous-sided Towhee, 4 (40, 16); Black-capped Chickadee, 3.5 (35, 14); Com. Yellowthroat, 3.5; Brown Creeper, 3 (30, 12); Black-and-white Warbler, 3; Downy Woodpecker, 2; Blue Jay, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Gray Catbird, 2; Am. Robin, 2; Blue-winged Warbler, 2; Chestnut-sided Warbler, 2; Brown-headed Cowbird, 2; Com. Flicker, 1.5; Great Crested Flycatcher, 1.5; Scarlet Tanager, 1.5; Wood Duck, 1; Broad-winged Hawk, 1; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; Com. Crow, 1; Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Canada Warbler, 1; Song Sparrow, 1; Ruffed Grouse, 0.5; E. Phoebe, 0.5; House Wren, 0.5; Yellow-throated Vireo, 0.5; N. Oriole, 0.5; Cardinal, 0.5; Rose-breasted Grosbeak, +. **Total:** 38 species; 81.5 territorial males (806/km<sup>2</sup>, 326/100 acres). **Remarks:** Special thanks to Jim Cavanaugh for his help — *ANDREW MAGEE, Woollybear, Troy, N. H. 03465*

**3. MIXED HARDWOODS.** — **Location:** New York, Chautauqua Co., Erie Lake Plain, 0.5 mile NW of East Middle Rd. RR bridge trestle; 42°31'48"N, 79°12'49"W, Silver Creek Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 12.95 ha = 32 acres (nearly rectangular, planimetered). **Description of Plot:** The overstory is dominated by Red Maple (*Acer rubrum*) and Sugar Maple (*A. saccharum*) dominate the understory. In the shrub layer (woody plants > 15 in. tall and < 1 in dbh) Spicebush (*Lindera benzoin*) and S. Arrowwood (*Viburnum dentatum*) are common. A high seasonal water table resulted in pools of standing water throughout the census period. A quantitative survey of the vegetation resulted in the following: trees ≥ 4 in dbh, on the basis of ten 13.2 ft X 82.5 ft transects, 210/acre, total basal area 99 ft<sup>2</sup>/acre. Species comprising 90% of total number of trees: Red Maple, 53, 25, 28, 50, Shagbark Hickory, 57, 27, 21, 50; Red Oak (*Quercus rubra*), 20, 10, 38, 40; Am. Linden (*Tilia americana*), 20, 10, 4, 20; Am. Beech (*Fagus grandifolia*), 20, 10, 3, 20, and Sugar Maple, 12, 6, 2, 30. Understory trees (trees ≥ 1 in, but < 4 in. dbh), based on same sample areas 566/acre; total basal area 16 ft<sup>2</sup>/acre. Species comprising 90% of total number of trees: Red Maple, 91, 16, 26, 30, Sugar Maple, 101, 18, 19, 30; Am. Beech, 71, 13, 15, 40, Hop Hornbeam (*Ostrya virginiana*), 71, 13, 13, 40, grapes (*Vitis spp.*), 131, 23, 9, 20; and Shagbark Hickory, 30, 5, 8, 30. Trees by diameter size class: A (4-6 in.), 77, 37, 10.0, 10; B (6-9 in.), 81, 38, 23.4, 24; C (9-15 in.), 36, 17, 24.9, 25; D (15-21 in.), 12, 6, 21.7, 22; F (27-33 in.), 4, 2, 18.1, 19. Shrub stems/acre 3500; canopy cover 80-90%, canopy height approximately 50 ft. **Edge:** Surrounded by shrub/open field. **Topography:** Flat, lowland. **Elevation:** 640 ft. **Coverage:** 1975; May 20; June 9-11, 13, 15, 20, 22, 26, 28; 0600-0900 hours, and 1920-2115 hours. Total man-hours: 22.5. **Census:** Wood Thrush, 8.5 (66, 27),

Red-eyed Vireo, 8 (62, 25); E. Wood Pewee, 4 (31, 13); Veery, 3 (23, 9); Great Crested Flycatcher, 2; Cardinal, 2; Rose-breasted Grosbeak, 2; Indigo Bunting, 2; Am. Robin, 1.5; Mallard, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Com. Crow, 1; House Wren, 1; Gray Catbird, 1; Yellow Warbler, 1; Scarlet Tanager, 1; Rufous-sided Towhee, 1. **Total:** 19 species; 43 territorial males (332/km<sup>2</sup>, 134/100 acres). **Coverage:** 1976: May 23, 25; June 8, 14, 17, 21-22, 28, 30; between 0600 and 0900 hours. Total man-hours: 21. **Census:** Red-eyed Vireo, 13 (100, 41); Am. Redstart, 7 (54, 22); E. Wood Pewee, 4 (31, 13); Wood Thrush, 4; Am. Robin, 3.5 (27, 11); N. Oriole, 3 (23, 9); Downy Woodpecker, 2; Great Crested Flycatcher, 2; Scarlet Tanager, 2; Cardinal, 2; Song Sparrow, 2; Com. Flicker, 1; Black-capped Chickadee, 1; Veery, 1; Ovenbird, 1; Com. Yellowthroat, 1; Rose-breasted Grosbeak, 1; House Wren, 0.5; **Total:** 18 species; 51 territorial males (394/km<sup>2</sup>, 159/100 acres). **Remarks:** These censuses were funded by Niagara Mohawk Power Corporation. Paul G. Kalka conducted much of the fieldwork. —JOSEPH M. MCMULLEN, ROY S. SLACK, and VINCENT J. LUCID, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N. Y. 13088.

**4. MIXED HARDWOODS FOREST.** — **Location:** New York; Chautauqua Co., Erie Lake Plain, 0.5 mile SW of East Middle Road RR bridge trestle; 42°31'47"N, 79°13'02"W, Silver Creek Quadrangle, USGS. **Continuity:** New. **Size:** 7.69 ha = 19 acres (nearly square, measured). **Description of Plot:** The overstory and understory are dominated by Am. Beech (*Fagus grandifolia*), Hop Hornbeam (*Ostrya virginiana*), and Sugar Maple (*Acer saccharum*). Large clumps of grapes (*Vitis* spp.) are present throughout the plot. In these clumps, grapes have outcompeted the upper strata, resulting in large open areas. A quantitative survey of the vegetation resulted in the following: Trees ≥ 4 in. dbh, on the basis of ten 13.2 X 82.5 ft transects, 129/acre, total basal area 69.1 ft<sup>2</sup>/acre. Species comprising 90% of total number of trees: Am. Beech, 16, 13, 65, 20; Hop Hornbeam, 32, 25, 6, 40; Sugar Maple, 20, 16, 14, 30; Black Cherry (*Prunus serotina*), 12, 9, 3, 20; Red Oak (*Quercus rubra*), 12, 9, 3, 20; Bitternut Hickory (*Carya cordiformis*), 16, 13, 4, 20; White Ash (*Fraxinus americana*), 12, 9, 3, 20. Understory trees (trees ≥ 1 in., but < 4 in. dbh) based on same sample areas, 1001/acre; total basal area 23.7 ft<sup>2</sup>/acre. Species comprising 90% of the total number of understory trees: Sugar Maple, 394, 39, 33, 90; Hop Hornbeam, 131, 13, 20, 80; grapes, 162, 16, 11, 60; Am. Beech, 101, 10, 12, 10; Yellow Birch (*Betula alleghaniensis*), 40, 7, 20; Am. Elm (*Ulmus americana*), 40, 4, 5, 20; White Ash, 20, 2, 4, 20. Trees by diameter size class: A (3-6 in.) 85, 54, 10.0, 11; B (6-9 in.) 36, 23, 9.7, 11; C (9-15 in.) 20, 13, 17.5, 19; D (15'-21 in.) 12, 8, 19.9, 23; F (27-33 in.) 4, 2, 32.5, 36. Shrub stems/acre 5400; canopy cover 75-85%; canopy height 50-60 ft. **Edge:** Abandoned RR track bed on one side, mixed hardwoods on one side, hayfield on two sides. **Topography:** Essentially flat. **Elevation:** 700 ft. **Coverage:** May 19, 21, 28; June 6, 10, 21, 23, 27-29; from 0600 to 0930 hours, and 2000 to 2130 hours. Total man-hours: 27. **Census:** Am. Redstart, 20.5 (267, 108); Red-eyed Vireo, 10 (130, 53); Cardinal, 6 (78, 32); Gray Catbird, 5 (65, 26); Wood Thrush, 4.5 (59, 24);

Veery, 3.5 (46, 18); Scarlet Tanager, 3 (39, 16); Rufous-sided Towhee, 3; Brown-headed Cowbird, 2; Rose-breasted Grosbeak, 2; E. Wood Pewee, 1.5; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Indigo Bunting, 1; Com. Flicker, 0.5; Black-capped Chickadee, 0.5; Com. Yellowthroat, 0.5. **Total:** 18 species; 66.5 territorial males. (865/km<sup>2</sup>, 350/100 acres)

**Remarks:** This census was funded by Niagara Mohawk Power Corporation as part of a larger study. —JOSEPH M. MCMULLEN and ROY S. SLACK, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N. Y. 13088.

**5. MIXED UPLAND FOREST.** — **Location:** New York; Ulster Co., 1 mile SE of Mohonk Lake; 41°46'N, 74°09'W, Mohonk Lake Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 142 ha = 350 acres (surveyed) **Description of Plot:** See AB 29: 1083 (1975). **Coverage:** April 10; May 15, 22-26, 30; June 2-9, 11-12, 14, 16, 18, 20, 29; July 4, 8-9, 19; between 0445 and 0800 hours and occasionally at dusk. Total man-hours: 75. **Census:** Wood Thrush, 53 (37, 15); Rufous-sided Towhee, 44 (31, 13); Great Crested Flycatcher, 28.5 (20, 8); E. Wood Pewee, 26 (18, 7); Red-eyed Vireo, 22.5 (16, 6); Black-and-white Warbler, 19 (13, 5); Am. Robin, 18.5 (13, 5); Scarlet Tanager, 16.5 (12, 5); Ovenbird, 15 (11, 4); Indigo Bunting, 14 (10, 4); Com. Flicker, 13 (9, 4); Song Sparrow, 12.5 (9, 4); Blue Jay, 12 (8, 3); Chipping Sparrow, 12; Dark-eyed Junco, 11.5 (8, 3); Red-winged Blackbird, 11 (8, 3); Rose-breasted Grosbeak, 10 (7, 3); Winter Wren, 9.5 (7, 3); Field Sparrow, 9.5; Downy Woodpecker, 8 (6, 2); Tufted Titmouse, 8; E. Phoebe, 7 (5, 2); Brown Thrasher, 7; Veery, 7; Worm-eating Warbler, 7; Black-capped Chickadee, 6.5 (5, 2); Gray Catbird, 6.5; Prairie Warbler, 6.5; Com. Yellowthroat, 6.5; Louisiana Waterthrush, 6 (4, 2); Am. Redstart, 5.5 (4, 2); N. Oriole, 5.5; House Wren, 5 (4, 1); Black-throated Blue Warbler, 5; Com. Grackle, 5; Yellow-rumped Warbler, 4 (3, 1); Cardinal, 4; Am. Goldfinch, 4; White-breasted Nuthatch, 3.5 (2, 1); Hairy Woodpecker, 3 (2, 1); Cedar Waxwing, 3; Whip-poor-will, 2; Pileated Woodpecker, 2; Hermit Thrush, 2; E. Bluebird, 2; Nashville Warbler, 2; E. Kingbird, 1.5; Yellow-throated Vireo, 1.5; Blue-winged Warbler, 1.5; Mallard, 1; Ruffed Grouse, 1; Green Heron, 1; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Belted Kingfisher, 1; Least Flycatcher



Mixed Upland Forest watershed with second growth fields and deciduous trees. Photo/James Stapleton.

1, Blue-gray Gnatcatcher, 1; Golden-crowned Kinglet, 1; Golden-winged Warbler, 1; Yellow Warbler, 1; Magnolia Warbler, 1; Black-throated Green Warbler, 1; Blackburnian Warbler, 1; Pine Warbler, 1; Purple Finch, 1; Red-breasted Nuthatch, 0.5. Singing cowbirds were ubiquitous. **Total:** 66 species; 512.5 territories ( $362/\text{km}^2$ , 146/100 acres). **Remarks:** 44 nests were found: 13 Red-winged Blackbird, 7 Woodthrush, 5 phoebe and grackle, 2 flicker, Blue Jay, robin and oriole, 1 Hairy Woodpecker, kingbird, pewee, Yellow-throated Vireo, Louisiana Waterthrush, and Rose-breasted Grosbeak. Special thanks to Karl Beard for assistance in monitoring nests. — **JIM STAPLETON**, *The Mohonk Trust, Mohonk Lake, New Paltz, N. Y. 12561.*

**6. UPLAND OAK FOREST.** — **Location:** New York; Delaware Co.; about 1.5 miles N of Pine Lake on South Hill about 2 miles E of West Davenport;  $42^\circ 28' 33''\text{N}$ ,  $74^\circ 56' 15''\text{W}$ , West Davenport Quadrangle, USGS. **Continuity:** Established 1971 (1972); 4 intermittent years. **Size:** 11.8 ha = 29.1 acres (nearly square, essentially 6 X 5 units of 208 ft edge, measured with steel tape into a grid of one acre units). **Description of Plot:** See AB 26: 661-662, 941 (1972). **Weather:** Mean average daily temperature and total precipitation for April  $45.3^\circ\text{F}$ , 5.32 in., May  $52.5^\circ$ , 4.21 in., June  $66.4^\circ$ , 8.66 in., July  $65.1^\circ$ , 3.18 in. No gross temperature deviations from the 30-year average. Precipitation was above normal all 4 months, particularly April, +2.04 in., June, +5.04 in. Cloudy about half the census trips. **Coverage:** June 5, 9, 13, 15, 18, 23, 27-28; July 1, 4-6, 11; between 0600 and 1000 hours. **Total:** 30 man-hours. **Census:** Ovenbird, 24 (204, 82); Red-eyed Vireo, 10 (85, 34); E. Wood Pewee, 8 (68, 27); Hermit Thrush, 5 (42, 17); Brown Creeper, 4 (34, 14), Dark-eyed Junco, 2; Downy Woodpecker, 1.5; Scarlet Tanager, 1.5; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Great Crested Flycatcher, 0.5. **Total:** 11 species; 58.5 territorial males ( $497/\text{km}^2$ , 201/100 acres). **Remarks:** An apparent decrease in species number and density again. — **J. ROBERT MILLER**, *Hartwick College, Oneonta, N.Y. 13820.*

**7. YOUNG RED MAPLE-GRAY BIRCH FOREST.** — **Location:** New York; St. Lawrence Co., 4 miles NE of Waddington at Coles Creek,  $44^\circ 53' \text{N}$ ,  $75^\circ 07' \text{W}$ , Louisville Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, paced longitudinally and estimated laterally). **Description of Plot:** Forest crown partially closed with heavy understory (65%) of shrubs averaging 1 m in height; 73% herbaceous ground cover; typical young moist woodland; trees average 10 m in height and stems average 2 m apart. The canopy trees followed by relative density and dbh in cm were: Red Maple (*Acer rubrum*) 43%, 7; Gray Birch (*Betula populifolia*) 25%, 7; Quaking Aspen (*Populus tremuloides*) 11%, 10; Willow (*Salix* sp.) 7%, 6; White Ash (*Fraxinus americana*) 6%, 8; Sugar Maple (*A. saccharum*) 2%, 10; Black Cherry (*Prunus serotina*) 1%, 8; with Basswood (*Tilia americana*), Am. Elm (*Ulmus americana*), Mossy-cup Oak (*Quercus macrocarpa*), and Yellow Birch (*B. lutea*), making up the remaining 5%. **Edge:** Bounded by similar woods, except one side bounded by Coles Creek. **Topography:** Flat. **Elevation:** 250 ft. **Weather:** Higher than average rainfall during the period. **Coverage:** June 2-3, 9-11, 16-18; July 2; between 0530 and 2100 hours. **Total:** 10 man-hours. **Census:** Yellow Warbler, 16 (198, 80); E. Wood Pewee, 11 (136, 55); House Wren, 9 (111, 45); N. Oriole, 9; Am. Robin, 8, (99, 40); Wood Thrush, 8; Veery, 8; Am. Redstart, 8, Song Sparrow, 8; Rose-breasted Grosbeak, 7 (86, 35), Warbling Vireo, 6 (74, 30); Black-capped Chickadee, 5 (62, 25); Red-eyed Vireo, 5; Ovenbird, 5; Rufous-sided Towhee, 5; White-throated Sparrow, 4 (49, 20); Great Crested Flycatcher, 3 (37, 15); Com. Yellowthroat, 3, Red-winged Blackbird, 3; Com. Grackle, 3; Chipping Sparrow, 3; Least Flycatcher, 2; Cardinal, 2; Indigo Bunting, 2; Com. Flicker, 1; Gray Catbird, 1; Cedar Waxwing, 1; Pileated Woodpecker, +. **Total:** 28 species, 146 territorial males ( $1804/\text{km}^2$ , 730/100 acres)

July 2; between 0530 and 2110 hours. **Total:** 10 man-hours. **Census:** Veery, 14 (173, 70); Yellow Warbler, 12 (148, 60); Redstart, 11 (136, 55); Red-eyed Vireo, 8 (99, 40); White-throated Sparrow, 8; Com. Yellowthroat, 7 (86, 35); N. Oriole, 7; Com. Grackle, 7; Song Sparrow, 6 (74, 30); Am. Robin, 5 (62, 25); Rose-breasted Grosbeak, 5; Great Crested Flycatcher, 4 (49, 20); Gray Catbird, 4, E. Wood Pewee, 3 (37, 15); Com. Flicker, 2; Ovenbird, 2, Blue Jay, 1; Black-capped Chickadee, 1; Wood Thrush, 1; Warbling Vireo, 1; Black-and-white Warbler, + **Total:** 21 species; 109 territorial males ( $137/\text{km}^2$ , 545/100 acres). **Visitors:** Ruffed Grouse, Tree Swallow, Cedar Waxwing, Starling, Am. Goldfinch. **Remarks:** Located one mile from the St. Lawrence River on Chase Mills Road along Coles Creek. The river water level changes affects the water level of Coles Creek and have contributed to a wet substrate along much of the plot. One female cowbird was seen consistently. This study was partially supported by the State University of New York at Oswego and the U.S. Fish and Wildlife Service Contract No. 141600056067. — **GEORGE R. MAXWELL**, *Rice Creek Biological Field Station, Dept of Zoology, State Univ. College, Oswego, N.Y. 13126.*

## 8. YOUNG WHITE ASH — BASSWOOD FOREST.

— **Location:** New York; St. Lawrence Co., 3 miles SW of Morristown at Jacques Cartier State Park,  $44^\circ 33' \text{N}$ ,  $75^\circ 41' \text{W}$ , Morristown Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, pace longitudinally and estimated laterally). **Description of Plot:** Forest crown closed with 41% understory of shrubs averaging 1 m in height; a 75% herbaceous ground cover, typical young deciduous forest along the St. Lawrence River in northern New York. The trees average 11 m in height and stems average 2.1 m apart. The canopy trees followed by relative density and dbh in cm were: White Ash (*Fraxinus americana*) 30%, 11; Basswood (*Tilia americana*) 15%, 12; Gray Birch (*Betula populifolia*) 12%, 12; Quaking Aspen (*Populus tremuloides*) 10%, 10, Red Maple (*Acer rubrum*) 9%, 13; Sugar Maple (*A. saccharum*) 7%, 11; White Pine (*Pinus strobus*) 7%, 20, Black Cherry (*Prunus serotina*) 2%, 12; Yellow Birch (*B. lutea*) 2%, 14, with Am. Elm (*Ulmus americana*), Scotch Pine (*P. sylvestris*), Red Oak (*Quercus rubra*), Hop-Hornbeam (*Ostrya virginiana*), Black Walnut (*Juglans nigra*), Hemlock (*Tsuga canadensis*) and White Oak (*Q. alba*) making up the remaining 6%. **Edge:** Bounded on all sides by similar woods. **Topography:** Flat. **Elevation:** 300 ft. **Weather:** Higher than average rainfall during the period. **Coverage:** June 2-3, 9-11, 16-18; July 2; between 0530 and 2100 hours. **Total:** 10 man-hours. **Census:** Yellow Warbler, 16 (198, 80); E. Wood Pewee, 11 (136, 55); House Wren, 9 (111, 45); N. Oriole, 9; Am. Robin, 8, (99, 40); Wood Thrush, 8; Veery, 8; Am. Redstart, 8, Song Sparrow, 8; Rose-breasted Grosbeak, 7 (86, 35), Warbling Vireo, 6 (74, 30); Black-capped Chickadee, 5 (62, 25); Red-eyed Vireo, 5; Ovenbird, 5; Rufous-sided Towhee, 5; White-throated Sparrow, 4 (49, 20); Great Crested Flycatcher, 3 (37, 15); Com. Yellowthroat, 3, Red-winged Blackbird, 3; Com. Grackle, 3; Chipping Sparrow, 3; Least Flycatcher, 2; Cardinal, 2; Indigo Bunting, 2; Com. Flicker, 1; Gray Catbird, 1; Cedar Waxwing, 1; Pileated Woodpecker, +. **Total:** 28 species, 146 territorial males ( $1804/\text{km}^2$ , 730/100 acres)

**Remarks:** Located partially within the Jacques Cartier State Park and partially outside along a service road to adjacent cottages. The St. Lawrence River is 200 m from the north boundary. Six female cowbirds were observed each visit. This study was partially supported by the State University of New York at Oswego and the U.S. Fish and Wildlife Service, Contract No. 14-16-0005-6067. — **GEORGE R. MAXWELL**, Rice Creek Biological Field Station, Dept. of Zoology, State Univ. College, Oswego, N Y 13126.

**9. BIRCH-MAPLE-OAK FOREST. — Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mile S of intersection of State Rte 228 and Kepple Road on Todd Sanctuary; 40°44'N, 79°42'W., Freeport Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 9 ha = 22.4 acres (square, measured and grided with line and compass). **Description of Plot:** See AB 28: 992-993 (1974). **Weather:** Warm with frequent rains. **Coverage:** May 31; June 7, 9, 17, 22-23, 25-26, 29-30, July 5; between 0500 and 0800 hours or 1825 and 2130 hours. Total man-hours: 31. **Census:** Red-eyed Vireo, 10.5 (116, 47); Cardinal, 7.5 (83, 33); Scarlet Tanager, 4 (44, 18); Tufted Titmouse, 3.5 (39, 16); Wood Thrush, 3.5; Acadian Flycatcher, 2.5; Blue-gray Gnatcatcher, 2.5; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Kentucky Warbler, 2; Black-capped Chickadee, 1.5; White-breasted Nuthatch, 1.5; Ruffed Grouse, 1; Downy Woodpecker, 1; Cerulean Warbler, 1; Hooded Warbler, 1; Brown-headed Cowbird, 1 (female); Yellow-billed Cuckoo, 0.5; Carolina Wren, 0.5; Gray Catbird, 0.5; Louisiana Waterthrush, 0.5; Chipping Sparrow, 0.5; Field Sparrow, 0.5; Broad-winged Hawk, +; Black-billed Cuckoo, +; Screech Owl, +; Barred Owl, +; Ruby-throated Hummingbird, + (female); E. Phoebe, +; Blue Jay, +; Rufous-sided Towhee, +. **Total:** 32 species; 52 territorial and non-territorial males or females ( $574/\text{km}^2$ , 232/100 acres). **Visitors:** Pileated Woodpecker, Hairy Woodpecker, Com. Crow, Am. Robin, Cedar Waxwing, Yellow-throated Vireo, N. Oriole, Com. Grackle, Rose-breasted Grosbeak, Indigo Bunting, Am. Goldfinch. **Remarks:** Nests located: Red-eyed Vireo, 2; Broad-winged Hawk, Ruffed Grouse, Yellow-billed Cuckoo, Blue Jay, Black-capped Chickadee, Carolina Wren, Cardinal. I thank G. Thomas Bancroft and Jeff Maugans for their assistance. This research funded by a grant from the Audubon Society of Western Pennsylvania. — **CHARLES W. BIER**, 221 Lawrence Avenue, Pittsburgh, Pa. 15238.

**10. BURNED DISTURBED UPLAND OAK FOREST. — Location:** Pennsylvania, Lycoming Co., Tiadaghton State Forest, 2.8 miles NE of Haneyville; 41°21'N, 77°25'W, Jersey Mills Quadrangle, USGS. **Continuity:** New. **Size:** 9.7 ha = 24 acres (rectangular, 1320 X 792 ft). **Description of Plot:** Part of a 95-acre timber sale completed in 1972. All trees in excess of 2 in. were felled except for selected seed trees. The area was included in the 3400 acres burned in a forest fire April 19-21, 1976. There is an average of 12 seed trees/acre, 60% Red Oak (*Quercus rubra*), 27% Hickory, 13% White Birch (*Betula papyrifera*); average 11.1 in.; on the first trip all appeared dead, by the last trip about 10% had produced

leaves. Tree reproduction prior to the fire averaged 1100 seedlings or sprouts/acre; 73% Red Maple (*Acer rubrum*), 7% Black Birch (*B. lenta*), 6% White Birch, 6% White Oak (*Q. alba*), 8% other species; all aerial portions were killed by the fire but most had sprouted from the root collar by the end of the count period. There is Bracken (*Pteridium aquilinum*), Com. Cinquefoil (*Potentilla simplex*), Whorled Loosstrife (*Lysimachia quadrifolia*) and grasses in various densities which by the end of the census period had completely covered the plot. Burned remnants of unmerchantable portions of felled trees and burned stems of Mountain Laurel (*Kalmia latifolia*) and Witch-hazel (*Hamamelis virginiana*) are scattered over most of the plot. A logging road through the E portion and along the S edge, planted to Tall Fescue and Birdsfoot Trefoil, did not burn. **Edge:** Bordered on S and W by similar area, on N and E by forest similar to plot prior to cutting, now burned. **Topography:** Flat. **Elevation:** 1740 ft. **Weather:** See Census 11 for monthly averages. During counts the temperature varied from 45° to 75° F (mean 58°). Skies were overcast on 4 trips. **Coverage:** May 21, 26, 28; June 2-3, 25; July 9, between 0622 and 0949 hours EDT or 1949 and 2018 Total man-hours: 8. **Census:** Rufous-sided Towhee, 5 (51, 21); Com. Yellowthroat, 3 (31, 13); Am. Robin, 2; Field Sparrow, 2; E. Kingbird, 1; E. Bluebird, 1; Indigo Bunting, 1; Com. Flicker, 0.5; Blue Jay, 0.5; White-breasted Nuthatch, 0.5; Brown Thrasher, 0.5; N. Oriole, 0.5; Brown-headed Cowbird, 0.5 (female); Great Crested Flycatcher, +; Com. Raven, +; House Wren, +; Rose-breasted Grosbeak, +; Chipping Sparrow, +. **Total:** 18 species; 18 territorial males or females ( $185/\text{km}^2$ , 75/100 acres). **Remarks:** Nests found: Am. Robin; E. Bluebird, Field Sparrow. During the census period groundcover increased from 0 to virtually 100% and the robins had deserted the area. The House Wren, Indigo Bunting and yellowthroats appeared only after mid-June — **CHARLES E. SCHWARZ**, Penn. Dept. of Environmental Resources, 1405 Pine Crest Dr., South Williamsport, Pa. 17701.

**11. DISTURBED UPLAND OAK FOREST. — Location:** Pennsylvania; Lycoming Co., Williamsport Municipal Watershed, 8 miles SW of Williamsport Quadrangle, USGS. **Continuity:** Established 1975 **Size:** 10.1 ha = 25 acres (irregular, surveyed). **Description of Plot:** See AB 29: 756 (1975). This was the second growing season after cutting. **Weather:** 30-year averages in parenthesis. Mean temperature: May 58.3°F (60.1°), June 71.6° (68.6°); precipitation: May 3.81 in. (3.99 in.), June 5.31 in (3.25 in.). During counts the temperature varied from 38° to 60° (mean 51°); skies were overcast on 3 trips. **Coverage:** May 22-23, 29, 31; June 1, 5-6, 8; between 0558 and 0841 hours, EDT. Total man-hours: 16 **Census:** Rufous-sided Towhee, 10 (99, 40); Chipping Sparrow, 5.5 (54, 22); Field Sparrow, 5 (49, 20); Com. Yellowthroat, 5; House Wren, 3.5 (35, 14); Black-and-white Warbler, 3 (30, 12); E. Bluebird, 2; Indigo Bunting, 2; Great Crested Flycatcher, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1; Golden-winged Warbler, 1; E. Wood Pewee, 0.5; Yellow-breasted Chat, 0.5; N. Oriole, 0.5; Brown-headed Cowbird, 0.5 (female); Scarlet Tanager, 0.5; Red-tailed Hawk, +; Black-billed Cuckoo, +; Gray Catbird, +; Black-throated Green

Warbler, +; Cardinal, +. **Total:** 23 species; 43.5 territorial males or females ( $430/\text{km}^2$ , 174/100 acres). **Remarks:** Field Sparrows increased from 2 to 5 and the bluebird and Black-and-white Warbler both doubled their numbers. The total number of species decreased by 2, the number of individuals increased by 1. The E. Bluebird with 1 territorial male was inadvertently omitted from last year's totals. Appreciation is extended to the Williamsport Municipal Water Authority for permission to conduct the study. — *CHARLES E. SCHWARZ, 1405 Pine Crest Drive, South Williamsport, Pa 17701.*

## 12. MOUNTAIN TOP, OAK-MAPLE FOREST. —

**Location:** Pennsylvania; Westmoreland Co., 10 miles SSW of Ligonier, 6 miles S of Laughlintown in Forbes State Forest on top of Laurel Mountain;  $40^\circ 07' 37''\text{N}$ ,  $79^\circ 10' 50''\text{W}$ , Ligonier Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 6.07 ha = 15 acres (rectangular, 330 X 1980 ft, measured). **Description of Plot:** See AB 28:993-4 (1974). **Weather:** Sunny, some cloud cover, mostly warm and clear. **Coverage:** June 5-6, 9, 12-13. Hours: 0500-0930, 1200-1300 and 1700-1930. Total party-hours: 12. **Census:** Red-eyed Vireo, 6 (99, 40), Ovenbird, 3 (49, 20); Solitary Vireo, 2; Scarlet Tanager, 2; E. Wood Pewee, 1.5; Rose-breasted Grosbeak, 1.5; Rufous-sided Towhee, 1.5; Dark-eyed Junco, 1.5, Red-breasted Nuthatch, 1; House Wren, 1; Chipping Sparrow, 1; Blue Jay, 0.5; Brown Creeper, 0.5; Wood Thrush, 0.5; Veery, 0.5; Com. Yellowthroat, 0.5; Barred Owl, +; Hairy Woodpecker, +; Com. Crow, +. **Total:** 19 species; 24.5 territorial males ( $404/\text{km}^2$ , 163/100 acres). **Remarks:** A major physical change in the area was the cutting of two herbaceous openings in the forest during the fall of 1974, each measuring approximately 300 X 150 ft; one on either side of the plot but not opposite each other. This probably accounts for the appearance of House Wren and Chipping Sparrow. The openings were cut by the Pennsylvania Bureau of Forestry as part of a wildlife management plan. — *R. CARRELL ABBOTT (compiler), Carnegie Museum, Pittsburgh, Pa. 15213.*

**13. OAK-MAPLE FOREST. — Location:** Pennsylvania; Washington Co., 2 miles WSW of Finleyville;  $40^\circ 14' 37''\text{N}$ ,  $80^\circ 01' 57''\text{W}$ , Hacket Quadrangle, USGS. **Continuity:** New. **Size:** 8.66 ha = 21.41 acres (quadrangular, 1450 X 700 X 1600 X 360 ft., entire perimeter measured with steel tape and Brunton compass) **Description of Plot:** The dominant canopy trees are White Oak (*Quercus alba*) and Sugar Maple (*Acer saccharum*). Most prominent in the understory are saplings of Sugar Maple and Black Cherry (*Prunus serotina*). The ground cover is primarily Pale Jewelweed (*Impatiens pallida*) and May-apple (*Podophyllum peltatum*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 176/acre; total basal area 185.5  $\text{ft}^2/\text{acre}$ . Species comprising 90% of the total number of trees: Sugar Maple, 68, 39, 22, 100; Red Maple (*A. rubrum*), 22, 13, 7, 67; Red Oak (*Q. rubra*), 18, 11, 19, 67; Black Cherry, 17, 10, 9, 83; Dead, 17, 10, 6, 67, Am. Elm (*Ulmus americana*), 10, 6, 3, 33; White Oak, 7, 4, 24, 50. Trees by diameter size class: A (3-6 in.)

35, 20, 4, 3; B (6-9 in.) 42, 24, 13, 11; C (9-15 in.) 63, 37, 51, 46; D (15-21 in.) 18, 11, 33, 30; E (21-27 in.) 3, 2, 10, 9; F (27-33 in.) 3, 2, 16, 15; G (33-40 in.) 8, 5, 59, 53 Shrub stems/acre 3675; ground cover 63%; canopy cover 81%; average canopy height 118 ft (range 102-143)

**Edge:** Southern edge is bordered by a 15-year-old strip mine. Forest continues to the E but lacks the large oaks and contains more second-growth species. Northern edge is bordered by Peter's Creek. Western edge is adjacent to a cemetery. **Topography:**  $17^\circ$  N facing slope. **Elevation:** 1070-1150 ft. **Weather:** Usually sunny and warm; rain during 3 trips. **Coverage:** May 21-24, 26, 28-31; June 3, between 0540 and 2045, EDT. Total party-hours: 23.6 **Census:** Acadian Flycatcher, 9 (104, 42); Red-eyed Vireo, 6 (69, 28); Wood Thrush, 5.5 (63, 26); Blue-gray Gnatcatcher, 2; Cardinal, 2; Cerulean Warbler, 1.5; Kentucky Warbler, 1.5; E. Wood Pewee, 1; Carolina Chickadee, 1; Gray Catbird, 1; Am. Robin, 1; Am. Robin, 1, Brown-headed Cowbird, 1; Scarlet Tanager, 1; Rufous-sided Towhee, 1; Great Horned Owl, 0.5; Hairy Woodpecker, 0.5; Screech Owl, +; Chimney Swift, +; Com. Flicker, +; Pileated Woodpecker, +; Downy Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +. **Total:** 27 species; 38.5 territorial males or females ( $444/\text{km}^2$ , 180/100 acres). **Visitors:** Starling, E Meadowlark, N. Oriole, Com. Grackle, Indigo Bunting, Am. Goldfinch, and Song Sparrow. **Remarks:** Four nests were located: Screech Owl, Hairy Woodpecker, Acadian Flycatcher, and Wood Thrush. Thanks to Eileen Higbee and Lorinda Richardson for their help and to Glen Phillips for his advice and assistance. — *ROGER V. and MARGARET A. HIGBEE, 219 Blue Jay Drive, Canonsburg, Pa. 15317.*

## 14. STREAM VALLEY-MIXED MESOPHYTIC FOREST. —

**Location:** Pennsylvania; Butler Co., Buffalo Township,  $1\frac{1}{4}$  miles SW of Iron Bridge (on Iron Bridge Road) along the Winfield RR  $40^\circ 44' \text{N}$ ,  $79^\circ 42' \text{W}$ , Freeport Quadrangle, USGS. **Continuity:** Established 1975 (1976). **Size:** 16.5 ha = 40.77 acres (1100 m transect X 75 m on each side, line measured along RR bed following stream). **Description of Plot:** A transect line paralleling Buffalo Creek, including wooded valley sides, and open and wooded bottomland. Stream width: 7-16 m. The dominant bottomland canopy trees are: Yellow Birch (*Betula lutea*), Sycamore (*Platanus occidentalis*) and Basswood (*Tilia americana*), while the dominant valley side canopy includes: E. Hemlock (*Tsuga canadensis*), hickories, Black Birch (*Betula lenta*), Red and Black Oaks (*Quercus rubra* and *Q. velutina*) and White Ash (*Fraxinus americana*). Of thirty-one species of shrubs listed, the most common are: Witch-hazel (*Hamamelis virginiana*), hawthorn (*Crateagus* sp.), Virginia Creeper (*Parthenocissus quinquefolia*), Poison Ivy (*Rhus radicans*), Grape (*Vitis* sp.), and Flowering Dogwood (*Cornus florida*). Saplings of Slippery Elm (*Ulmus rubra*), Sugar Maple (*Acer saccharum*) and ash are also abundant. Herbaceous cover varies widely from 20% on shaded valley sides to 100% in open areas near stream. Fifty-one species of herbaceous plants recorded. The dominant species of woodland herbs include: Spinulose Wood-fern (*Dryopteris spinulosa*), Christmas Fern (*Polystichum acrostichoides*), Wild Ginger (*Asarum canadense*) and violets (*Viola* spp.). In the open areas the

common herbs are: Jewelweed (*Impatiens*), Coneflower (*Rudbeckia laciniata*), Thin-leaved Sunflower (*Helianthus decapetalus*) and Wing-stem (*Actinomeris alter-nifolia*). A synopsis of a vegetation survey follows: Trees 3-inches dbh and larger, based on eleven 0.1-acre circular samples, 181 trees/acre, total basal area 107.7 square feet/acre. Species comprising 90% of the total number of trees: Basswood, 25, 14, 15, 54; Black Birch, 16, 9, 5, 36; Hop Hornbeam (*Ostrya virginiana*), 16, 9, 2, 45; Sugar Maple, 15, 8, 6, 64; dead trees, 14, 7.5, 7, 64; E Hemlock, 12, 7, 9.5, 54; White Ash, 12, 7, 6, 54; Yellow Birch, 12, 7, 8, 27; Sycamore, 9, 5, 14, 18; Black Oak, 8, 4, 4, 18; Slippery Elm, 6, 4, 4, 18; Red Oak, 5, 3, 8.5, 45; Sweet Pignut Hickory (*Carya ovalis*), 5, 3, 3, 18; Crabapple (*Pyrus coronaria*), 5, 3, 0.7, 18; White Oak (*Q. alba*), 4, 2, 4, 18. Trees by diameter-size class: A (3-6 in.) 73, 40, 7.3, 7; B (6-9 in.) 32, 18, 9.7, 9; C (9-15 in.) 50, 28, 37.4, 35; D (15-21 in.) 22, 12, 40.5, 38; E (21-27 in.) 4, 2, 8.4, 7.5; F (27-33 in.) 1, 0.5, 4.4, 3.5. Shrub stems/acre 23,000; ground cover 56%; canopy cover 63%; average canopy height 17.7 m (range 14.6-23.5 m). **Edge:** Similar habitat continues N for about a mile. South bordered by small strip of same habitat followed by fields in the bottomland. East and W edges are upland forest. **Topography:** Valley width (at stream level) 75-125 m. Western edge is largely on valley side; E portion includes stream and is nearly flat. Smaller stream enters valley from W. **Elevation:** Stream bed 800 ft, valley ridge 1000 ft. **Coverage, 1975:** June 8, 10, 12-13, 17, 20-22, 25, 29-30; 0500-0800 and 1930-2130. Total man-hours: 27.5. **Census:** Red-eyed Vireo, 17 (103, 42); Acadian Flycatcher, 9 (55, 22); Scarlet Tanager, 9; Indigo Bunting, 7 (42, 17); Wood Thrush, 6 (36, 15); Cardinal, 5 (30, 12); Tufted Titmouse, 4.5 (27, 11); Blue-gray Gnatcatcher, 4 (24, 10); Cerulean Warbler, 4; Brown-headed Cowbird, 4; Ruffed Grouse, 3 (18, 7); Carolina Wren, 3; Kentucky Warbler, 3; Song Sparrow, 3; Ruby-throated Hummingbird, 2; E. Wood Pewee, 2; Black-capped Chickadee, 2; Ovenbird, 2; Louisiana Waterthrush, 2; Com. Yellowthroat, 2; Hairy Woodpecker, 1.5; Downy Woodpecker, 1.5; White-breasted Nuthatch, 1.5; Brown Creeper, 1; Gray Catbird, 1; Black-and-white Warbler, 1; N. Parula, 1; Yellow-throated Warbler, 1; N. Oriole, 1; Yellow-billed Cuckoo, +; Screech Owl, +; Great Horned Owl, +; Belted Kingfisher, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Cedar Waxwing, +; Yellow-throated Vireo, +; Hooded Warbler, +; Am. Goldfinch, +; Rufous-sided Towhee, +. **Total:** 42 species; 104 territorial and non-territorial males or females (630/km<sup>2</sup>, 255/100 acres). **Remarks:** Yellow-throated Warbler, a recently expanding species, was not previously recorded in area. Nests located: Acadian Flycatcher, 2; Red-eyed Vireo, 2 (one with a young cowbird); Indigo Bunting, 2. Fledglings noted: Great Horned Owl, 2; Louisiana Waterthrush, 1, 1; N. Oriole, 1; Indigo Bunting, 3, 4. **Coverage, 1976:** May 29-30; June 3-4, 8, 14, 16, 18, 22-24, 26-28; July 8; between 0500 and 0845 or 1900 and 2130. Total man-hours: 41. **Census:** Red-eyed Vireo, 16.5 (102, 41); Acadian Flycatcher, 8.5 (52, 21); Scarlet Tanager, 7.5 (45, 18); Indigo Bunting, 7 (42, 17); Wood Thrush, 6.5 (40, 26); Tufted Titmouse, 5 (30, 23); Cardinal, 5; Song Sparrow, 4.5 (27, 11); Blue-gray Gnatcatcher, 3.5 (22, 9); Kentucky Warbler, 3.5; Cerulean Warbler, 3 (18, 7); Com. Yellowthroat, 3; E. Wood Pewee, 2.5; Gray Catbird, 2.5; Ruby-throated

Hummingbird, 2; Black-capped Chickadee, 2; Brown-headed Cowbird, 2; Am. Goldfinch, 2; Ruffed Grouse, 1.5; Cedar Waxwing, 1.5; Ovenbird, 1.5; N. Oriole, 1.5; Com. Flicker, 1; Downy Woodpecker, 1; Blue Jay, 1; White-breasted Nuthatch, 1; N. Parula, 1; Louisiana Waterthrush, 1; Belted Kingfisher, 0.5; Yellow-throated Vireo, 0.5; Solitary Vireo, 0.5; Black-and-white Warbler, 0.5; Yellow-billed Cuckoo, +; Screech Owl, +; Great Horned Owl, +; Pileated Woodpecker, +; Hairy Woodpecker, +; E. Phoebe, +; Brown Creeper, +; Hooded Warbler, +; **Total:** 40 species; 100.5 territorial and non-territorial males or females (615/km<sup>2</sup>, 249/100 acres). **Remarks:** Carolina Wren changed from 3 territories to visitor. Nests located: Com. Flicker, Downy Woodpecker, Wood Thrush, Solitary Vireo, Red-eyed Vireo, Cerulean Warbler. I give special thanks to G Thomas Bancroft, J. J. Hickey, William R. Anderson and Donna Egbert for their help. This study was conducted as part of a grant from the Audubon Society of Western Pennsylvania — CHARLES W. BIER, 221 Lawrence Avenue, Pittsburgh, Pa. 15238.

**15. BRUSHY RIDGE.** — **Location:** West Virginia, Braxton Co., 2 miles E of Sutton; 38°40'08"N, 80°40'27"W, Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 X 660 yds, measured longitudinally and estimated laterally)

**Description of Plot:** The dominant trees are Tulip-tree (*Liriodendron tulipifera*) and Black Locust (*Robinia pseudo-acacia*). Most prominent in the understory are Sumac (*Rhus glabra*) and blackberry (*Rubus* sp.). The ground cover is primarily goldenrod (*Solidago* sp.) and Field Basil (*Satureja vulgaris*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six 0.1 acre circular samples, 28/acre; total basal area 16.3 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Tulip-tree, 22, 28, 26, 50; Black Locust, 28, 36, 17, 16; Black Cherry (*Prunus serotina*), 15, 19, 13, 33; *Sassafras albidum*, 7, 8, 6, 16. Trees by diameter size class: A (3-6 in.) 63, 81, 6, 39; B (6-9 in.), 12, 15, 4, 21; C (9-15 in.) 2, 2, 1, 8; E (21-27 in.) 2, 2, 5, 31. Shrub stems/acre 7316; ground cover 96% canopy cover 47%; average canopy height 30 ft (range 9-73). **Edge:** Bordered on both sides by slightly older brushy second growth. **Topography:** A broad ridge extending E and dropping 60 ft in elevation over full length. **Elevation:** 1380 to 1320 ft. **Weather:** Hot and dry. **Coverage:** June 5 - 10; between dawn and 0745 hours or 1923 and 2048 hours. Total party-hours: 12. **Census:** Prairie Warbler, 4 (66, 27); Indigo Bunting, 3 (49, 20); Golden-winged Warbler, 2.5; Yellow-breasted Chat, 2.5; Field Sparrow, 2.5; Rufous-sided Towhee, 2; White-eyed Vireo, 1.5; Red-eyed Vireo, 1; Cardinal, 1; Blue-gray Gnatcatcher, 0.5; Chimney Swift, +; Great Crested Flycatcher, +; Blue Jay, +; Carolina Chickadee, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 16 species; 20.5 territorial males (338/km<sup>2</sup>, 137/100 acres) **Visitors:** Red-bellied Woodpecker, Downy Woodpecker, Acadian Flycatcher, E. Wood Pewee, Tufted Titmouse, White-breasted Nuthatch, Gray Catbird, Brown Thrasher, Wood Thrush, Kentucky Warbler, Com Yellowthroat and Com. Grackle. **Remarks:** This field is part of the acreage acquired to build Sutton Dam and the surrounding recreation facilities. The field was in pasture

when abandoned prior to 1956, when the dam was built, and is now 20 years into the cycle of reforestation. The low population and the species comprising that population were both predictable. During the week of July 3-10 most of the birds were still present but singing much less and not confined to earlier territories. — BOB HOSTOTTE, LORRAINE HARPER, CAROLYN RUDDLE, JEAN ANDERSON, VIRGINIA JOHNSON, RICHARD DIENER and GLEN PHILLIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

**16. ELM-CHERRY WOODLAND.** — **Location:** West Virginia; Ohio Co., 1.6 miles ESE from the intersection of Route 40 and the Valley Grove-Middle Creek Road; 40°04'51"N, 80°32'11"W, Valley Grove Quadrangle, USGS. **Continuity:** Established in 1956 (*Restart* 24 52-54); 5 intermittent years. **Size:** 4.05 ha = 10 acres. **Description of Plot:** The dominant canopy trees are Black Cherry (*Prunus serotina*) and Elm (*Ulmus rubra* and *U. americana*). Most prominent in the understory are Poison Ivy (*Rhus radicans*) and Multiflora Rose (*Rosa multiflora*). The ground cover is primarily Mayapple (*Podophyllum peltatum*) and Panic Grass (*Panicum* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six 0.1 acre circular samples, 175/acre; total basal area 54 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Black Cherry, 57, 33, 32, 100; Red Elm, 25, 14, 18, 83; Am. Elm, 25, 14, 18, 67; Laurel Oak (*Quercus imbricaria*), 20, 11, 63, 17; Black Walnut (*Juglans nigra*), 13, 8, 12, 50; dead trees, 15, 9, 8, 83. Trees by diameter size class: A (3-6 in.) 100, 57, 10, 19; B (6-9 in.) 48, 27, 15, 27; C (9-15 in.) 18, 11, 15, 27; D (15-21 in.) 8, 5, 15, 37. Shrub stems/acre 3475; ground cover 85%; canopy cover 74% average canopy height 56 ft (range 38-82). **Edge:** Bound on two ends by like habitat, on E side by a lake and on the W by an unused road, a narrow strip of like habitat, then a meadow. **Topography:** East-facing slope of a low hill. **Elevation:** 1130-1200 ft. **Weather:** Rain on 3, cloudy on 5 of 17 trips. **Coverage:** May 27-31; 16 trips; between dawn and 0740 hours or 1810 and 2030 hours, with one trip at 1100 hours. Total party-hours: 14.5. **Census:** Gray Catbird, 6 (148, 60); Acadian Flycatcher, 3 (74, 30); House Wren, 3; Wood Thrush, 3; Yellow Warbler, 3; Am. Robin, 2; Blue-gray Gnatcatcher, 2; Red-eyed Vireo, 2; Cardinal, 2; Song Sparrow, 2; White-eyed Vireo, 1.5; Rufous-sided Towhee, 1.5; E. Wood Pewee, 1; Carolina Chickadee, 1; Com Yellowthroat, 1; Am. Redstart, 1; Indigo Bunting, 1; Downy Woodpecker, 0.5; Carolina Wren, 0.5; Spotted Sandpiper, +; Chimney Swift, +; Pileated Woodpecker, +; E Phoebe, +; Rough-winged Swallow, +; Am. Crow, +; Brown Thrasher, +; Yellow-throated Vireo, +; N. Oriole, +; Com. Grackle, +; Brown-headed Cowbird, +; Am. Goldfinch, +; Field Sparrow, +. **Total:** 32 species; 37 territorial males (914/km<sup>2</sup>, 370/100 acres). **Remarks:** This is the fifth in a series of studies, made at five-year intervals, to record the changes in bird life as the vegetation of an old field grows toward climax forest. The total number of territorial males is reduced 19% from five years ago (but only 7% from 20 years ago) while the number of species has increased 25%. The population of Gray Catbirds has remained relatively stable throughout the entire period while that of Yellow Warbler has

declined 50% in the last 15 years. Another significant change is the absence of Yellow-breasted Chat this year. This species has declined steadily from 5 in 1956 to zero in 1976. Also missing from this year's count, but not necessarily from habitat changes, were Willow Flycatcher, Warbling Vireo and Ruffed Grouse. Only continued study can determine definite trends as the vegetation changes. Two nests were found: Downy Woodpecker and Acadian Flycatcher. — BERNARD TROTT and GLEN PHILLIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

**17. MAPLE-OAK-HICKORY FOREST.** — **Location:** West Virginia; Braxton Co., 3 miles NNE from Sutton; 38°42'26"N, 80°41'24"W, Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** A hardwood forest last timbered about 1950. The dominant canopy tree is Sugar Maple (*Acer saccharum*). Most prominent in the understory are Flowering Dogwood (*Cornus florida*), Redbud (*Cercis canadensis*), and saplings of the canopy species. The ground cover is primarily Virginia Creeper (*Parthenocissus quinquefolia*). The results of a quantitative vegetation survey based on six 0.1 acre samples are: Trees 3-inches diameter and over, 180/acre, total basal acre, 84.3 ft<sup>2</sup>/acre. Species comprising 91% of the total number of trees: Sugar Maple, 67, 37, 33, 100, Red Maple (*A. rubrum*), 7, 4, 2, 33; Red Oak (*Quercus rubra*), 17, 9, 12, 67; Chestnut Oak (*Q. Prinus*), 18, 10, 11, 50; Black Oak (*Q. velutina*), 3, 2, 4, 33; White Oak (*Q. alba*), 3, 2, 7, 33; Pignut Hickory (*Carya glabra*), 8, 5, 8, 33; Mockernut Hickory (*C. tomentosa*), 3, 2, 4, 33, Shagbark Hickory (*C. ovata*), 5, 3, 3, 33; White Ash (*Fraxinus americana*), 18, 10, 11, 67; dead trees, 12, 6, 3, 50. Trees by diameter size class: A (3-6 in.) 73, 41, 7.3, 9, B (6-9 in.) 47, 26, 14, 18; C (9-15 in.) 45, 25, 36, 42, D (15-21 in.) 15, 8, 27, 30. Shrub stems/acre 3640; ground cover 40%; canopy cover 84%; average canopy height 77 ft (range 73-85). **Edge:** Forest continues on all sides. **Topography:** The centerline is about level at 1340 ft. It follows a terrace or flat on a steep hillside. The flat is 50 to 75 ft wide and slopes down to the S about 6° breaking off sharply to a 25° slope. On the upper (N) side the lateral slope is 30° to 45°. The difference in elevation laterally is 100-140 ft. **Weather:** Clear, hot, dry. **Coverage:** June 6-9; between dawn-0800 hours and late evening. Total party-hours: 10. **Census:** Acadian Flycatcher, 6 (99, 40); Red-eyed Vireo, 5 (82, 33); Blue-gray Gnatcatcher, 4 (66, 27); Black-and-white Warbler, 3 (49, 20); Wood Thrush, 2.5; Cerulean Warbler, 2; Carolina Chickadee, 1.5; Tufted Titmouse, 1.5; Worm-eating Warbler, 1.5; Scarlet Tanager, 1.5; Great Crested Flycatcher, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Yellow-throated Vireo, 1; Summer Tanager, 1; Cardinal, 1; Ovenbird, 0.5; Hooded Warbler, 0.5; Rufous-sided Towhee, 0.5; Red-tailed Hawk, +; Red-bellied Woodpecker, +; Blue Jay, +; Brown-headed Cowbird, +; Indigo Bunting, +. **Total:** 25 species; 37 territorial males (610/km<sup>2</sup>, 247/100 acres). **Remarks:** Probably owing to hot, dry weather bird song was minimal, barely adequate for this type of census. Titmice, nuthatches and gnatcatchers had young out of nest. Nest found: Worm-eating Warbler. — GREG

**EDDY, EDWARD ILGEN-FRITZ, JEAN ANDERSON,  
GEORGE KOCH (compiler), Brooks Bird Club, 707  
Warwood Ave., Wheeling, W. Va. 26003.**

**18. MATURE NORTHERN HARDWOODS.** —

**Location:** West Virginia; Brooke Co., Bethany, 40°12'45"N; 80°35'55" to 80°33'45"W; Bethany Quadrangle, USGS. **Continuity:** Established 1971; 4 intermittent years. **Size:** 12.14 ha = 30 acres (square). **Description of Plot:** See AB 25: 972-973 (1971). **Coverage:** April 25; May 14, 25; June 3-4, 14; July 16; 10 trips, between 0530 and 2115 hours. Total party-hours: 20 **Census:** Acadian Flycatcher, 13 (107, 43); Red-eyed Vireo, 12 (99, 40); Blue-gray Gnatcatcher, 7 (58, 23); Cerulean Warbler, 7; Cardinal, 5 (41, 17); Tufted Titmouse, 4 (33, 13); Rufous-sided Towhee, 3 (25, 10); E. Wood Pewee, 2.5; Kentucky Warbler, 2.5; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Carolina Chickadee, 2; Carolina Wren, 2; Wood Thrush, 2; House Wren, 1.5; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Indigo Bunting, 0.5; Ruffed Grouse, +; Mourning Dove, +; Yellow-billed Cuckoo, +; Chimney Swift, +; Com. Flicker, +; Blue Jay, +; Com. Crow, +; Com. Yellowthroat, +; Com. Grackle, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 35 species; 77 territorial males ( $634/\text{km}^2$ , 257/100 acres). **Remarks:** Red-eyed Vireo has increased from a low of 5 in 1974 to 12 this year. Nests found: Ruffed Grouse, 1; E. Phoebe, 1; Cerulean Warbler, 1. — *A. R. BUCKELEW, JR., Biology Dept., Bethany College, Bethany, W. Va. 26032.*

**19. OAK-BEECH-TULIP-TREE FOREST.** — **Location:** West Virginia; Braxton Co., E. Sutton city limits; 38°39'51"N, 80°42'04"W, Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 100 X 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are Oak, White (*Quercus alba*), Black (*Q. velutina*), Red (*Q. rubra*), Beech (*Fagus grandifolia*) and Tulip-tree (*Liriodendron tulipifera*). Most prominent in the understory are Sourwood (*Oxydendrum arboreum*) and Dogwood (*Cornus florida*). The ground cover is primarily Virginia Creeper (*Parthenocissus quinquefolia*) and False Nettle (*Boehmeria cylindrica*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 229/acre; total basal area 95.5 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: White Oak, 30, 12.9, 13.6, 50; Black Oak, 25, 11, 10.5, 83; Red Oak, 16, 7, 16.8, 67; Beech, 23, 10, 22.8, 67; Tulip-tree, 18, 8, 10, 10.7, 83; Sourwood, 18, 80, 1.8, 50; Pignut Hickory (*Carya glabra*), 5, 2, 2.5, 50; dead trees, 18, 8, 1.8, 50; Sugar Maple (*Acer saccharum*), 13, 5.7, 4.1, 67; Basswood (*Tilia americana*), 13, 5.7, 3.3, 33. Trees by diameter size class: A (3-6 in.) 115, 49, 11.5, 12; B (6-9 in.) 66.7, 29, 20.2, 21.2; C (9-15 in.) 41.7, 18, 33, 34.7; D (15-21 in.) 5, 2, 9, 9.4; E (21-27 in.) 1.6, 1, 5.2, 5.4; F (27-33 in.) 3, 1.4, 16, 16.8. Shrub stems/acre, 2633; ground cover 47%; canopy cover 82.5%; average canopy height 93 ft (range 79-107). **Edge:** Forest continues on all sides. **Topography:** Hollow, the centerline follows an old trail

that parallels a small drain. **Elevation:** 900 ft ascending to 1060 ft. **Weather:** Clear, dry, warm. **Coverage:** June 5-9; between dawn and 0730 hours or 1900 and 2100 hours. Total party-hours: 12. **Census:** Acadian Flycatcher, 5 (82, 33); Red-eyed Vireo, 4 (66, 27); Worm-eating Warbler, 2.5; Scarlet Tanager, 2; Blue-gray Gnatcatcher, 1.5; Ovenbird, 1.5; E. Wood Pewee, 1; Wood Thrush, 1; Black-and-white Warbler, 1; Louisiana Waterthrush, 1; Cerulean Warbler, 0.5; Downy Woodpecker, +; Great Crested Flycatcher, +; Yellow-throated Vireo, +; Solitary Vireo, +; Kentucky Warbler, +; Hooded Warbler, +. **Total:** 17 species; 21 territorial males or females ( $346/\text{km}^2$ , 140/100 acres). **Visitors:** Pileated Woodpecker, Red-bellied Woodpecker, Blue Jay, Tufted Titmouse, White-breasted Nuthatch, N Parula, Brown-headed Cowbird, Cardinal. — *WILLIAM H. SMITH, 2346 Johnstown Road, Huntington, W Va 25701.*

**20. OAK-BEECH-TULIP-TREE FOREST.** — **Location:** West Virginia; Kanawha Co., 3.5 mi. S of South Charleston; centerline starts at 38°19'18"N, 81°41'42"W and extends S curving to the E, Charleston West Quadrangle, USGS. **Continuity:** Established 1972, 5 consecutive years. (Formerly called Oak-Hickory Forest) **Description of Plot:** See AB 26; 946-947 (1972), and 28 995-996 (1974). **Size:** 6.07 ha = 15 acres (rectangular 110 x 660 yds, measured longitudinally and estimated laterally). **Weather:** Generally clear with light winds, except at the end of the period when some heavy showers fell **Coverage:** May 11, 20, 26-28, 30-31; June 7-8; mostly between 0700 and 1100. Total man-hours: 18. **Census:** Red-eyed Vireo, 6 (99, 40); Tufted Titmouse, 4 (66, 27), Cerulean Warbler, 4; Ovenbird, 4; Wood Thrush, 2.5, Hooded Warbler, 2.5; Acadian Flycatcher, 2; Blue-gray Gnatcatcher, 2; Black-and-white Warbler, 2; Rufous-sided Towhee, 2; Carolina Wren, 1.5; Kentucky Warbler, 1.5; Cardinal, 1.5; Ruby-throated Hummingbird, 1, E. Wood Pewee, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Yellow-throated Vireo, 1; Worm-eating Warbler, 1; Scarlet Tanager, 1; Yellow-billed Cuckoo, 0.5; Downy Woodpecker, 0.5; White-eyed Vireo, 0.5; Am. Redstart, 0.5; Broad-winged Hawk, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Brown-headed Cowbird, +; Summer Tanager, +. **Total:** 32 species; 44.5 territorial males ( $733/\text{km}^2$ , 297/100 acres). **Remarks:** The winter season was very mild for the third year in a row, and an excessively dry spring was marked by several occasions when the temperatures dropped overnight into the 20s, causing severe "burning" of a number of trees, Tulip-tree and Sycamore, especially. This caused the woods to seem more open than usual at the start of the study. Continued drought during the study contributed to light bird song. Additionally, the access road to the property was locked this year in the early dawn. This five-year study indicates that the population has remained remarkably steady and the only changes to be noted are in the diminishing of the open edge birds such as Indigo Bunting and White-eyed Vireo as the openings close. No nests were found. My thanks to George Koch for consultation on evaluation — *CONSTANCE R. KATHOLI, Brooks Bird Club, 930 Woodland, South Charleston, W. Va. 25303.*

**21. OAK-MAPLE FOREST.** — **Location:** West Virginia; Braxton Co., 3 mi. ENE of Sutton; 38°41'11"N, 80°39'37"W, Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15.0 acres (rectangular, 110 X 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are oak and maple. Most prominent in the understory are Flowering Dogwood (*Cornus florida*) and saplings of the canopy trees. The ground cover is primarily seedlings of the canopy trees and Poison Ivy (*Rhus radicans*). A quantitative survey of the vegetation gave the following: Trees 3-inches diameter and over, based on six circular samples, 141/acre; total basal area 167 ft<sup>2</sup>/acre. Species comprising 93% of the total number of trees: Red Oak (*Quercus rubra*), 5, 4, 19, 34; White Oak (*Q. alba*), 10, 7, 19, 67; Chestnut Oak (*Q. prinus*), 10, 7, 8, 17; Sugar Maple (*Acer saccharum*), 42, 29, 9, 100; Red Maple (*A. rubrum*), 1.6, 1, 0.3, 17; Black Walnut (*Juglans nigra*), 8, 6, 9, 17; Shagbark Hickory (*Carya ovata*), 5, 4, 5, 17; Mockernut Hickory (*C. tomentosa*), 10, 7, 2, 17; Pignut Hickory (*C. glabra*), 3, 2, 1, 34; White Ash (*Fraxinus americana*), 12, 8, 8, 34; Tulip-tree (*Liriodendron tulipifera*), 2, 1, 7, 17; Beech (*Fagus grandifolia*), 15, 11, 6, 50. Trees by diameter size class: A (3-6 in.) 40, 28, 4, 2; B (6-9 in.) 32, 22, 9.5, 6; C (9-15 in.) 33, 23, 26.7, 16; D (15-21 in.) 20, 14, 36, 21; E (21-27 in.) 5, 4, 15.5, 9; F (27-33 in.) 5, 4, 24.5, 15; G (33-40 in.) 5, 4, 35, 21; H (43 in.) 1.7, 2, 15, 9. Shrub stems/acre 6008; ground cover 52.9%; canopy cover 87.5%; average canopy height 88 ft (range 58-120). **Edge:** Forest continues in all directions except at the N end which is brushy. **Topography:** Starts near the top of a ridge, elevation 1340 ft, ascends to 1480 ft, and follows the ridge down to elevation 1360 ft. **Weather:** Clear and dry. **Coverage:** June 4-7; between dawn and 0730 hours or 1900 and 2100 hours. Total party-hours: 18. **Census:** Cerulean Warbler, 8 (132, 53); Acadian Flycatcher, 5 (82, 33); Hooded Warbler, 4 (66, 27); Red-eyed Vireo, 3.5 (58, 23); Am. Redstart, 3 (49, 20); E. Wood Pewee, 2.5; Wood Thrush, 2.5; Blue-gray Gnatcatcher, 2; Kentucky Warbler, 2; Indigo Bunting, 2; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Scarlet Tanager, 1; Cardinal, 1; Red-bellied Woodpecker, 0.5; White-eyed Vireo, 0.5; Yellow-throated Vireo, 0.5; Pileated Woodpecker, +; Carolina Chickadee, +; Summer Tanager, +; Rufous-sided Towhee, +. **Total:** 24 species; 43 territorial males or females (708/km<sup>2</sup>, 287/100 acres). **Visitors:** Solitary Vireo, Worm-eating Warbler, Am. Goldfinch, Field Sparrow. **Remarks:** At the present time horses graze the area which partially accounts for the lack of ground cover except for saplings of the canopy trees. There are two small clearings in which the brush birds were found. The greatest concentration of Cerulean Warblers was also found at the edges of these slashes. A Wood Thrush nest was found. Families of White-breasted Nuthatches, Tufted Titmice, and Great Crested Flycatchers were observed out of the nest. Special thanks to the many members of the Brooks Bird Club who assisted in the quantitative habitat description, especially Glen Phillips and George Koch. — *ANNE EDDY, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.*

**22. OAK-MAPLE-HICKORY FOREST.** — **Location:** West Virginia; Braxton Co., 3 mi. NNE of Sutton, 38°42'23"N, 80°41'14"W, Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** A forested, nearly level, tract of land near the foot of the mountain. Drainage from the slopes above provides a great amount of moisture during the early Spring and Summer. There is no evidence of recent timbering. The dominant canopy trees are oak, maple and hickory. Most prominent in the understory are saplings of the canopy trees, Tall Pawpaw (*Asimina triloba*) and Flowering Dogwood (*Cornus florida*). The ground cover is primarily May-apple (*Podophyllum peltatum*), Golden Ragwort (*Senecio aureus*), Black Cohosh (*Cimicifuga racemosa*) and a wide variety of ferns. A quantitative survey of vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 263/acre; total basal area 115.8 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Chestnut Oak (*Quercus prinus*), 13, 5, 9.5, 33; Red Oak (*Q. rubra*), 10, 38, 5.4, 50; Black Oak (*Q. velutina*), 7, 2.5, 43, 67; White Oak (*Q. alba*) 8.3, 3, 6, 50; Scarlet Oak (*Q. coccinea*), 17, 6, 8, 17; Sugar Maple (*Acer saccharum*), 35, 13, 7.1, 83; Red Maple (*A. rubrum*), 28, 11, 7, 67; Mockernut Hickory (*Carya tomentosa*), 8, 33, 12, 67; Pignut Hickory (*C. glabra*), 5, 2, 6.7, 50; White Ash (*Fraxinus americana*), 13, 5, 1, 67, Tulip-tree (*Liriodendron tulipifera*), 50, 19, 26.9, 67; dead trees, 20, 7.6, 3.5, 50. Trees by diameter class: A (3-6 in.) 102, 386, 10.2, 63; B (6-9 in.) 70, 26.6, 21, 13; C (9-15 in.) 65, 24.7, 52, 32; D (15-21 in.) 10, 38, 18, 11; E (21-27 in.) 5, 2, 24.5, 22.4; F (27-33 in.) 5, 2, 24.5, 15. Shrub stems/acre, 6542; ground cover 40%; canopy cover 91%; average canopy height 76 ft, (range 64-91). **Edge:** Bounded on all sides by similar habitat. **Topography:** A slight rise from 1220 to 1280 ft. **Weather:** Fair and warm. **Coverage:** June 6-10; between dawn and 0745 except one trip in late afternoon. Total man-hours: 18. **Census:** Acadian Flycatcher, 10 (165, 67); Red-eyed Vireo, 5 (82, 33), Wood Thrush, 3 (49, 20); Ovenbird, 3; Downy Woodpecker, 2; Blue-gray Gnatcatcher, 2; Kentucky Warbler, 2; Scarlet Tanager, 2; Com. Flicker, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Tufted Titmouse, 1; Worm-eating Warbler, 1; Cerulean Warbler, 1; Am. Redstart, 1; Cardinal, 1; White-breasted Nuthatch, + **Total:** 17 species; 37 territorial males (610/km<sup>2</sup>, 247/100 acres). **Visitors:** Com. Crow, Blue Jay, Carolina Chickadee, Solitary Vireo, Brown-headed Cowbird, Summer Tanager and Am. Goldfinch. **Remarks:** Nests located: 2 Acadian Flycatcher; 1 each Kentucky Warbler and Cardinal. Special recognition to George Koch for the quantitative survey of the vegetation. — *NEVADA LAITSCH (compiler) Brooks Bird Club, Inc., 707 Warwood Ave., Wheeling, W. Va. 26003.*

**23. RIVERSIDE-BIRCH-OAK-FOREST.** — **Location:** West Virginia; Braxton Co., 9 mi. due E of Sutton, W. Va. along the left fork of Holly River; 38°40'31"N, 80°32'13"W, Newville Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are Birch: Black (*Betula lenta*) and Red (*B. nigra*), and

**Oaks** White (*Quercus alba*) Red (*Q. rubra*) and Black (*Q. velutina*). Most prominent in the understory are Flowering Dogwood (*Cornus florida*) Am. Hornbeam (*Carpinus carolina*), and small saplings of the canopy trees. The ground cover is primarily Golden Ragwort (*Senecio aureus*), May-apple (*Podophyllum peltatum*), and greenbriar (*smilax* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-inches in diameter and over, based on six circular 0.1 acre samples shows 202/acre; total basal area 145 ft<sup>2</sup>/acre. Species comprising 92% of the total number of trees (figures after each give the number of trees/acre, relative density (%), relative dominance (%), and frequency in that sequence): Birch (Red and Black), 30, 15, 37, 80; Oaks (White, Red, Black), 30, 15, 11, 50; Am. Hornbeam, 23, 12, 2, 33; Hickories (Shagbark - *Carya ovata*) and (Pignut - *C. glabra*), 20, 10, 9, 66; Flowering Dogwood, 12, 6, 1, 17; Umbrella Magnolia (*Magnolia tripetala*), 15, 7, 5, 50; Tall Pawpaw (*Asimina triloba*), 12, 6, 1, 17; Sugar Maple (*Acer saccharum*), 12, 6, 8, 50; Tulip-tree (*Liriodendron tulipifera*), 10, 5, 12, 50; dead trees, 12, 6, 4, 50. Trees by diameter size class (number of trees/acre, relative density, basal area in ft<sup>2</sup>/acre, relative dominance): A (3-6 in.) 75, 37, 7.5, 5; B (6-9 in.) 48, 24, 14.5, 10; C (9-15 in.) 47, 23, 37, 26; D (15-21 in.) 20, 10, 36, 25; E (21-27 in.) 7, 3, 22, 14; F (27-33 in.) 3, 2, 16, 11; G (33-40 in.) 2, 1, 12, 8. Shrub stems/acre, 3825; ground cover 51%; canopy cover 96%; average canopy height 91 ft (range 50-111). **Edge:** Forested on all sides. Some game management plots are located about 100 yds from each end. **Topography:** Centerline is a level forest service road extending E at elevation 960 ft, with a hillside on the N and a river bottom on the S. **Weather:** Foggy in the early morning, clearing later in the day. **Coverage:** June 5-8; between dawn and 0730 hours and 0830 and 1130 hours. Total party-hours: 12. **Census:** Acadian Flycatcher, 7 (115, 47); Red-eyed Vireo, 7; Am. Redstart, 7; Wood Thrush, 3 (49, 20); Black-and-white Warbler, 3; Yellow-throated Vireo, 2; White-eyed Vireo, 1.5; Cerulean Warbler, 1.5; Scarlet Tanager, 1.5; E. Phoebe, 1; E. Wood Pewee, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; N. Parula, 1; Louisiana Waterthrush, 1; Kentucky Warbler, 1; Blue-gray Gnatcatcher, +; Worm-eating Warbler, +. **Total:** 18 species; 40.5 territorial males or females (667/km<sup>2</sup>, 270/100 acres). **Visitors:** Belted Kingfisher, Pileated Woodpecker, Downy Woodpecker, White-breasted Nuthatch, Cardinal, Indigo Bunting, Rufous-sided Towhee. **Remarks:** Nests located: Acadian Flycatcher, 1; phoebe, 1. A Black-and-white Warbler was seen feeding young. Game food plots may have influenced the presence of visitors such as the Cardinal, Indigo Bunting and towhee. — *E. R. CHANDLER, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.*

**24. DECIDUOUS FOREST WITH POND AND BROOK.** — **Location:** New Jersey; Bergen Co., Mahwah, Campgaw Mountain Reservation. **Continuity:** Established 1964; 13 consecutive years. **Size:** Approximately 16.7 ha = 41.32 acres (rectangular, 250 x 800 yds, paced). **Description of plot:** See *AFN* 19: 623-624 (1965). **Coverage:** May 25, 27; June 1, 3, 8, 10, 15, 17, 22; between 0530 and 0645. Total party-hours: 12. **Census:** Tree Swallow, 3 (18, 7); Tufted Titmouse, 3; House Wren, 3; Com. Flicker, 2; White-breasted Nuthatch, 2;

Gray Catbird, 2; Veery, 2; Starling, 2; Red-eyed Vireo, 2, Ovenbird, 2; Com. Yellowthroat, 2; Canada Goose, 1, Downy Woodpecker, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; Black-capped Chickadee, 1; Brown Creeper, 1; Am. Robin, 1, Wood Thrush, 1; Yellow-throated Vireo, 1; Blue-winged Warbler, 1; Louisiana Waterthrush, 1; Red-winged Blackbird, 1; N. Oriole, 1; Com. Grackle, 1; Scarlet Tanager, 1; Cardinal, 1; Rufous-sided Towhee, 1; Song Sparrow, 1. **Total:** 31 species; 45 territorial males (269/km<sup>2</sup>, 109/100 acres). **Remarks:** Breeding species were up 4 over 1975 and 6 above the average of the previous 8 years. The additions were not new birds since they have been fairly regular nesters in the area in recent years. The breeding and regular visitor list indicates a potential breeding population of 40-45 species if all conditions were fortuitous. In 1975 the Brown Creeper and E. Bluebird were new and unusual breeders. The creeper returned in 1976 but the bluebird did not even appear as a visitor. — *T. DYE, L. GAITSKILL, A. GALLI, J. MOFFAT, K. SJOLANDER, J. WHITE, J. WORRALL and J. BROTHERTON (compiler), Fyke Nature Association, 249 E. Crescent Ave., Mahwah, N. J. 07430.*

## 25. HICKORY-OAK-ASH FLOODPLAIN FOREST.

— **Location:** Maryland; Howard Co., Middle Patuxent River, due W of Hobbits Glen Golf Course, Columbia, 39°15'10"N, 76°54'45"W, Clarksville Quadrangle, USGS **Continuity:** Established 1971; 5 intermittent years. **Size:** 18.4 ha = 45.5 acres (L-shaped following the 310-ft contour, surveyed). **Description of Plot:** See *AB* 963-964 (1971). Total contiguous woodland, 1.1 mi<sup>2</sup> excluding tracts connected by corridors less than 600 ft wide **Coverage:** May 1-2, 31; June 16, 28; July 1-3, 9. Starting times ranged from 15 min before sunrise to 8 min after sunrise. Total man-hours: 26. **Census:** Gray Catbird, 38 (206, 84); Acadian Flycatcher, 16.5 (90, 36); Wood Thrush, 14.5 (79, 32); Red-eyed Vireo, 12.5 (68, 27); Cardinal, 11 (60, 24); Am. Redstart, 9.5 (52, 21); White-eyed Vireo, 7.5 (41, 16); Red-bellied Woodpecker, 7 (38, 15), Tufted Titmouse, 6.5 (35, 14); Downy Woodpecker, 5.5 (30, 12); Carolina Chickadee, 5.5; Carolina Wren, 5.5, Com. Yellowthroat, 5 (27, 11); Blue-gray Gnatcatcher, 4 (22, 9); Brown-headed Cowbird, 4; E. Wood Pewee, 3.5 (19, 8); Scarlet Tanager, 2.5; Veery, 2; N. Parula, 2, Louisiana Waterthrush, 2; Rufous-sided Towhee, 2, Yellow-throated Vireo, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Com Flicker, 1; Hairy Woodpecker, 1; E. Kingbird, 1; Blue Jay, 1; Cerulean Warbler, 1; Song Sparrow, 1; Belted Kingfisher, 0.5; Rough-winged Swallow, 0.5; Kentucky Warbler, 0.5; Hooded Warbler, 0.5; Indigo Bunting, 0.5, Am. Goldfinch, 0.5; Green Heron, +; Mallard, +; Red-shouldered Hawk, +; Barred Owl, +; Pileated Woodpecker, +; Com. Crow, +; N. Oriole, +. **Total:** 44 species, 180 territorial males (978/km<sup>2</sup>, 396/100 acres). **Remarks:** Kentucky Warbler continued its crash from 9 pairs in 1971, 4.5 pairs in 1974, and 1.5 pairs in 1975 to only small fractions of 2 territories in 1976. Carolina Wren continued its increase, reaching an all-time high of 55 territories. Whether there is any direct relationship between the increase in Carolina Wren and decrease in Kentucky Warbler remains to be determined. The Red-eyed Vireo population dropped very slightly from last

year while Gray Catbird continued its increase and reached a new high of 38 territories. Veery dropped sharply from 6 to 2 territories, possibly in response to an increase in Wood Thrushes from 8 to 14.5 territories. This plot is subject to severe flooding, which topples the large trees along the river, causes bank erosion, and deposition of huge quantities of silt. The most recent flood occurred on Jan. 1, 1976. — CHANDLER S. ROBBINS, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.

**26. MATURE DECIDUOUS FLOODPLAIN FOREST.** — **Location:** Maryland; Montgomery Co., Cabin John Island, Glen Echo; 2.5 mi. NW of the District of Columbia, between the C. and O. Canal and the Potomac River, just S of Cabin John Creek; Falls Church Quadrangle, USGS. **Continuity:** Established 1947; 24 intermittent years. **Size:** 7.6 ha = 18.75 acres (oblong, surveyed). **Description of Plot:** See AFN 1: 212-213 (1947) **Coverage:** April 3-4, 11, 17; May 1, 15, 23; June 6, 13, 20, 27; 13 trips; between 0630 and 1035 hours. Total man-hours: 27.6. **Census:** Starling, 12 (158, 64); Carolina Wren, 7 (92, 37); Acadian Flycatcher, 7; Red-eyed Vireo, 7; Wood Duck, 4 (53, 21); Carolina Chickadee, 4; Cardinal, 4; Downy Woodpecker, 3 (40, 16), Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Blue-gray Gnatcatcher, 2; Am. Redstart, 2; Barred Owl, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Prothonotary Warbler, 1; Brown-headed Cowbird, 1. **Total:** 21 species; 66 territorial males or females (870/km<sup>2</sup>, 352/100 acres). **Remarks:** The total of 66 territories is a dramatic decrease from 91.5 in 1975. Part of the decrease is the general trend downward of summer residents which started in 1952 but was accelerated this year by an unusual decrease of N. Parulas from 6.5 pairs last year to zero. But the bulk of the decrease this year is in Starlings which are at only half of their 1975 level. This may be because the Island has suffered recently from flood and high winds with a loss of many large trees which provided nesting holes. Other hole nesting species showing decreases are Downy Woodpecker and Tufted Titmouse. — JOAN H. CRISWELL (compiler) and J. R. GAUTHEY, Audubon Naturalist Society, 8940 Jones Mill Road, Washington, D.C. 20015.

**27. MIXED HARDWOOD FOREST.** — **Location:** Maryland; Calvert Co., NW of Plum Pt. and one mi. inland from Chesapeake Bay on Tobacco Rd. between Routes 263 and 261. **Continuity:** Established 1960; 16 intermittent years. **Size:** 11.3 ha = 28 acres. **Description of Plot:** See AFN 13: 333 (1959). **Weather:** 21 of the 24 trips were on clear days. High temperatures varied between 64° and 94° F. Both the creek and bog became dry in late June. **Coverage:** April 11, 14, 17, 19, 25, 29; May 3, 5, 7-9, 11-12, 16-17, 20, 23-24, 29; June 1, 4, 8, 11, 19, July 3, 5, 10, 16, 26; August 4, 14. Total: 24 trips averaging 90 min. each. **Census:** Red-eyed Vireo, 31 (274, 111), Wood Thrush, 17 (150, 61); Ovenbird, 15 (132, 54); Carolina Wren, 14 (124, 50); Acadian Flycatcher, 13 (115, 46); Cardinal, 13; Tufted Titmouse, 9 (79, 32); Kentucky Warbler, 7 (62, 25); Scarlet Tanager, 6 (53, 21); Rufous-sided Towhee, 6; Am. Woodcock, 5 (44, 18); E. Wood Pewee, 5; Red-bellied Woodpecker, 4 (35, 14);

Downy Woodpecker, 4; Carolina Chickadee, 4; N. Parula, 4; Louisiana Waterthrush, 4; Hairy Woodpecker, 3 (26, 11); Yellow-throated Vireo, 3; Pine Warbler, 3; Com. Yellowthroat, 3; Hooded Warbler, 3; Bobwhite, 2; Blue Jay, 2; Com. Grackle, 2; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; Am. Robin, 1; Blue-gray Gnatcatcher, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Field Sparrow, 1; Barred Owl, +; Ruby-throated Hummingbird, +; Pileated Woodpecker, +; E. Phoebe, +; Gray Catbird, +; Brown Thrasher, +; E. Bluebird, +; White-eyed Vireo, +; Prairie Warbler, +; Blue Grosbeak, +. **Total:** 48 species, 195 territorial males, (1721/km<sup>2</sup>, 696/100 acres)

**Remarks:** Territorial males declined to 195 from last year's 213, which is well below the 16-year average of 232. The Red-eyed Vireo and Wood Thrush were again the most abundant species, but both declined from the previous year. The Cardinal again declined and was the lowest in 13 years. Other species showing losses were N. Parula, Brown-headed Cowbird and Rufous-sided Towhee. Worm-eating Warbler was absent. Acadian Flycatcher increased and equalled the Cardinal. Other increases were Am. Woodcock, Tufted Titmouse and Com. Yellowthroat. New to the census area was Blue Grosbeak. These results probably reflect the serious logging that took place during the summer in the adjacent area, and which was begun in the plot well before the end of the census. — JOHN H. FALES, Ridge Road, Neeld Estate, Huntingtown, Md. 20639.

**28. UPLAND TULIP-TREE-MAPLE-OAK FOREST.** — **Location:** Maryland; Howard Co., W edge of Middle Patuxent River Valley, SW of Hobbits Glen Golf Course at Columbia; 39°12'55"N, 76°54'40"W, Clarksburg Quadrangle, USGS. **Continuity:** Established 1971, 6 consecutive years. **Size:** 11.98 ha = 29.6 acres (basically rectangular, 1125 ft N-S x 1200 ft E-W). **Description of Plot:** See AB 25: 971 (1971), and AB 26: 665 (1972). Plot is part of a 68-acre upland woods, connected by forested floodplain (see census 25) to more extensive tracts of upland woods; total contiguous woods, 1.1 mi<sup>2</sup>. **Coverage:** April 30; May 3; June 1-2, 18, 25; July 1, 6. All 8 trips in early morning, average starting time 6 min before sunrise. Total man-hours: 17. **Census:** Red-eyed Vireo, 16 (134, 54); Wood Thrush, 12 (100, 41); Acadian Flycatcher, 7.5 (63, 25); Gray Catbird, 7 (58, 24); Veery, 6 (50, 20); Cardinal, 6; Kentucky Warbler, 4 (33, 14); Scarlet Tanager, 4; Hooded Warbler, 3.5 (29, 12); Tufted Titmouse, 2.5; Carolina Wren, 2.5; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; E. Wood Pewee, 2; Rufous-sided Towhee, 2; Carolina Chickadee, 1.5; Brown-headed Cowbird, 1.5; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Blue Jay, 1; N. Parula, 1; Cerulean Warbler, 1; Ovenbird, 1; N. Oriole, 1; Com. Flicker, 0.5; Hairy Woodpecker, 0.5; White-breasted Nuthatch, 0.5; Blue-gray Gnatcatcher, 0.5; Yellow-billed Cuckoo, +; Com. Crow, +; Yellow-throated Vireo, +; Black-and-white Warbler, +; Louisiana Waterthrush, +; Am. Redstart, +. **Total:** 34 species; 91 territorial males (760/km<sup>2</sup>, 307/100 acres). — CHANDLER S. ROBBINS, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.

**29. MIXED UPLAND HABITAT.** — **Location:** District of Columbia, the central third of Glover-Archbold Park, a narrow, long stream valley park in the NW section. **Continuity:** Established 1960; 17 consecutive years. **Size:** 14.2 ha = 35 acres (irregularly shaped, roughly 1520 x 1000 ft in outside dimensions). **Description of Plot:** See *AFN* 14: 502-503 (1960). **Coverage:** March 29; April 3, 6, 8-11, 14, 16-18, 21, 24, 29-30; May 2-3, 6, 9, 13, 15, 17, 22, 24, 31; June 2, 5-6, 10, 13, 17; July 2-3, 5, 11, 17, 24; August 1, 12; between 0555 and 2045, 34 morning trips, 3 over noon hours, 6 evening trips. Total: 105.5 hours. **Weather:** Clear on half the trips, cloudy on half, with rain on 2 trips; calm or with light wind on all but 8 trips, when wind was up to 15 mph. Temperatures ranged from 40° to 90°F, averaged 64°. **Census:** Cardinal, 24 (169, 69); Veery, 23 (162, 66); Tufted Titmouse, 16 (113, 46); Carolina Wren, 14 (99, 40); Starling, 13 (92, 37); Gray Catbird, 12 (85, 34); Carolina Chickadee, 11 (78, 31); Rufous-sided Towhee, 11; Blue Jay, 9 (64, 26); Com. Crow, 8.5 (60, 24); Com. Flicker, 6 (42, 17); Downy Woodpecker, 6; Red-bellied Woodpecker, 5 (35, 14); White-breasted Nuthatch, 5; Red-eyed Vireo, 5; Wood Thrush, 3 (21, 9); Acadian Flycatcher, 2; Am. Robin, 2; Com. Grackle, 2; Mallard, 1; Wood Duck, 1; Mourning Dove, 1; Pileated Woodpecker, 1; Mockingbird, 1; Ovenbird, 1; Red-shouldered Hawk, +; Screech Owl, +; Am. Redstart, +. **Total:** 28 species; 183.5 territorial males (1296/km<sup>2</sup>, 524/100 acres). **Visitors:** (birds found irregularly in the area, but within their breeding period and known to breed in the vicinity): Green Heron, Turkey Vulture, Broad-winged Hawk, Rock Dove, Chimney Swift, Hairy Woodpecker, Great Crested Flycatcher, E. Wood Pewee, Brown Creeper, Brown Thrasher, Com. Yellowthroat, House Sparrow, Scarlet Tanager. **Remarks:** Nests found: Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Com. Flicker, 1; White-breasted Nuthatch, 1; Starling, 4. With the most extensive coverage yet, we still find trends mentioned in recent years continuing: fewer species, especially among birds that migrate south in winter, with numbers of territories maintained near average by the increased number of year-round residents. The nearly lost Acadian Flycatcher made a slight recovery, but not near the former average of 9; Wood Thrushes were up to 3, from 1.5 last year and + the year before, but we formerly had 10 to 12. Veeries were down from last year's 28, but well within their level in the last 10 years. Most regulars were at least present as visitors, but we lacked Brown-headed Cowbirds except during the migration period, had no Bobwhite, and only the Ovenbird, up slightly, in place of the 6 species and 32 breeding pairs of warblers in 1961. The Green Heron, a visitor, was the only addition to our cumulative list of 85 species. This was the fifth year for nesting Wood Ducks, the second for Mallards. — *SHIRLEY A. BRIGGS* (compiler), *OLIVE HOLBROOK, DAVID MEHLMAN, CHARLES N. STEELE, and DONALD WEBER, 7605 Honeywell Lane, Bethesda, Md. 20014.*

**30. COASTAL DISTURBED FLOODPLAIN.** — **Location:** Virginia; Gloucester Co., borders Gloucester C H. Sanitary District on the E, Route 14 for 130 ft at lower end; 37°24'N, 76°31'W, Gloucester Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See *AB* 30:1053 (1976). **Coverage:**

March 13, 28; April 10; May 2, 16, 30; June 6, 13, 20, 27, July 5, 11, 18, 24, 31; between 0530 and 1220 and 1330 and 1620 hours. Total man-hours: 23. **Census:** Carolina Wren, 3 (37, 15); Acadian Flycatcher, 2; Blue Jay, 1, 5; Tufted Titmouse, 1, 5; Red-eyed Vireo, 1, 5; Wood Duck, 1; Red-shouldered Hawk, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; White-eyed Vireo, 1; Louisiana Waterthrush, 1; Am. Woodcock, 0, 5; Hairy Woodpecker, 0, 5; Com. Yellowthroat, 0, 5; N. Parula, 0, 5; Com. Grackle, 0, 5; Am. Goldfinch, 0, 5; Rufous-sided Towhee, 0, 5; Green Heron, +; Belted Kingfisher, +; Yellow-billed Cuckoo, +; Barred Owl, +; Great Crested Flycatcher, +; E. Phoebe, +; White-breasted Nuthatch, +; Gray Catbird, +; Brown Thrasher, +; Blue-gray Gnatcatcher, +; Pine Warbler, +; Ovenbird, +; Scarlet Tanager, +; Summer Tanager, +; Red-winged Blackbird, +; Indigo Bunting, +; Chipping Sparrow, +. **Total:** 36 species; 20 territorial and non-territorial males (247/km<sup>2</sup>, 100/100 acres) **Remarks:** Only 5 nests were found: Red-shouldered Hawk; Carolina Wren; Hairy and Red-bellied Woodpecker; White-eyed Vireo. — *MARVIN L. WASS, Virginia Institute of Marine Science, Gloucester Point, Va 23062.*

**31. UPLAND OAK-HICKORY FOREST.** — **Location:** Virginia; Fairfax Co., Dranesville District Park, McLean, along Rte 193 (Old Georgetown Pike), approximately 3/4 mi. W Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973; 4 consecutive years. **Size:** 11.0 ha = 27.2 acres (measured on topographic map compiled by photogrammetric methods from aerial photograph). **Description of Plot:** See *AB* 25 636 (1971). **Weather:** Generally clear; light rain encountered on one trip. Temperatures ranged from 34° to 74°F. **Coverage:** April 10, 21, 24, 30; May 3-4, 5, 7, 12, 18, 21, 23-24, 28-29; June 10, 13, 15, 18, 23, 25, 28-29; July 3-4, 11; between 0520 and 1000 or 1550 and 2010 hours, EDT. Total party-hours: 51.5. **Census:** Red-eyed Vireo, 14.5 (132, 53); Carolina Wren, 7 (64, 26), Red-bellied Woodpecker, 6 (55, 22); Wood Thrush, 5.5 (50, 20); Carolina Chickadee, 4 (36, 15); White-breasted Nuthatch, 3.5 (32, 13); Downy Woodpecker, 3 (27, 11); Great Crested Flycatcher, 3; Tufted Titmouse, 3; Brown-headed Cowbird, 3; Acadian Flycatcher, 2, 5; Scarlet Tanager, 2, 5; Hairy Woodpecker, 2; E. Wood Pewee, 2; Com. Grackle, 2; Cardinal, 2; Mourning Dove, 1, 5; Blue Jay, 1, 5; Brown Creeper, 1, 5; Summer Tanager, 1; Louisiana Waterthrush, 0, 5. **Total:** 21 species, 71.5 territorial males or females (650/km<sup>2</sup>, 263/100 acres) **Visitors:** Red-tailed Hawk, Yellow-billed Cuckoo, Great Horned Owl, Barred Owl, Ruby-throated Hummingbird, Com. Flicker, Pileated Woodpecker, Com. Crow, Fish Crow, Gray Catbird, Am. Robin, E. Bluebird, Blue-gray Gnatcatcher, Starling, Worm-eating Warbler, Ovenbird, Kentucky Warbler, Hooded Warbler, Am. Redstart, N Oriole, Indigo Bunting, Am. Goldfinch, Rufous-sided Towhee. **Remarks:** 3 nests found: Red-bellied Woodpecker 1, Great Crested Flycatcher 1, Tufted Titmouse 1. The count of 14.5 Red-eyed Vireos seems remarkably high; previous counts were 6 in 1973 and 1975 and 9.5 in 1974. This species may have increased, but the high count may also have resulted from a much higher number (26) of field trips this year than in any

previous year, which provided data for a more careful delineation of territories. If this latter explanation is correct, then previous counts for this species may well have been too low. — *JOAN H. CRISWELL, JESSICA M. GIUSTI, BILL PER-LEE, ROBERT J. WATSON* (compiler), 2636 Marcey Rd., Arlington, Va. 22207.

### 32. UPLAND TULIP-TREE-OAK FOREST. —

**Location:** Virginia, Fairfax Co., U.S. Geological Survey National Center, Reston; 38°56'45"N, 77°21'50"W, Vienna Quadrangle, USGS. **Continuity:** Established 1974, 3 consecutive years. **Size:** 20.6 ha = 50.9 acres. **Description of Plot:** See AB 28: 701-2, 1003-4 (1974). **Weather:** March through July was cooler than normal; and precipitation was less than normal, particularly in April and July. **Coverage:** March 1, 8; April 9, 19, 21, 30; May 5, 9, 21, 23, 27-28, 31; June 1, 4, 10, 12, 22; July 5, 12. Total man-hours: 43.9. **Census:** Wood Thrush, 6 (29, 12), E Wood Pewee, 5 (24, 10); Carolina Wren, 5; Great Crested Flycatcher, 4 (19, 8); Blue Jay, 4; Carolina Chickadee, 4; Tufted Titmouse, 4; Cardinal, 4; Red-eyed Vireo, 3 (15, 6); Worm-eating Warbler, 3; Scarlet Tanager, 3; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Rufous-sided Towhee, 2; Broad-winged Hawk, 1; Com. Flicker, 1; Acadian Flycatcher, 1; Louisiana Waterthrush, 1; Kentucky Warbler, 1; Am. Redstart, 1; Brown-headed Cowbird, 1. **Total:** 23 species; 62 territorial males ( $301/\text{km}^2$ , 122/100 acres). **Remarks:** Nests found Com. Flicker, 1; Carolina Chickadee, 2; Wood Thrush, 9; Am. Robin, 2; Louisiana Waterthrush, 1; Cardinal, 3; Rufous-sided Towhee, 1. Ovenbirds decreased from an average of 3.5 pairs for the last two years to none. — *JOAN C. WOODWARD and PAUL W. WOODWARD*, 2433 Southgate Sq., Reston, Va. 22091.

### 33. MIXED DECIDUOUS FOREST. —

**Location:** North Carolina, Orange Co., partly within the research area of the North Carolina Botanic Garden, 2.5 mi. SE of the center of Chapel Hill; 35°53'N, 79°01'W, Chapel Hill Quadrangle, USGS. **Continuity:** New. **Size:** 12.55 ha = 31 acres (square, surveyed and gridded). **Description of Plot:** The dominant canopy trees are Post Oak (*Quercus stellata*), White Oak (*Q. alba*), and hickories. The most prominent shrub is Shortstalk Arrowwood (*Viburnum rafinesquianum*). Quantitative analysis of nine 0.1-acre circular samples gave the following results: Trees, 3 inches diameter and over, 269/acre; total basal area, 152 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees (figures after each species give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence): E. Red Cedar (*Juniperus virginiana*), 47, 18, 7, 80; Pignut Hickory (*Carya ovalis* or *glabra*), 31, 12, 7, 90; Post Oak, 31, 12, 27, 90; Shortleaf Pine (*Pinus echinata*), 24, 9, 8, 80; dead tree, 22, 8, 4, 90; White Oak (*Q. alba*), 21, 8, 23, 80; Sweet Gum (*Liquidambar styraciflua*), 20, 8, 2, 90; Mockernut Hickory (*C. tomentosa*), 9, 3, 7, 30; Black Oak (*Q. velutina*), 9, 3, 5, 60; Am. Elm (*Ulmus americana*), 8, 3, 0.6, 20; Flowering Dogwood (*Cornus florida*), 8, 3, 0.5, 40; Black Gum (*Nyssa sylvatica*), 7, 2, 0.5, 40; S. Shagbark Hickory (*C. caroliniana-septentrionalis*), 6, 2, 4, 30; Red Maple (*Acer rubrum*), 6, 2, 0.3, 40; White Ash (*Fraxinus americana*), 6, 2, 0.3, 40; Red Oak (*Q. rubra*), 4, 2, 0.9, 30; Spanish Oak (*Q. falcata*), 2, 0.8, 1, 20; Loblolly Pine (*P. taeda*), 1,

0.4, 0.2, 10; Scrub Pine (*P. virginiana*), 1, 0.4, 0.5, 10; Winged Elm (*U. alata*), 1, 0.4, 0.2, 10; Tulip-tree (*Liriodendron tulipifera*), 1, 0.4, 0.2, 10; Florida Maple (*A. saccharum floridanum*), 1, 0.4, 0.1, 10. Trees by diameter size class [figures after each class give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance(%)]: A (3-6 in.) 110, 42, 10, 7; B (6-9 in.) 69, 26, 19, 12; C (9-15 in.) 48, 18, 35, 23, D (15-21 in.) 7, 6, 26, 17; E (21-27 in.) 14, 5, 41, 27; F (27-33 in.) 3, 1, 15, 10; G (33-40 in.) 1, 0.4, 7, 5. Shrub stems/acre, 38,700; ground cover, 29%; canopy cover, 74% average canopy height, 70 ft (range 50-90 ft). **Edge:** Similar forest extends at least 50 m on one side, 25 m on another side; the remaining two sides continue into a large tract of similar forest. **Topography:** Gently slopes upward from the floodplain of Morgan Creek. **Elevation:** 260-290 ft. **Coverage:** April 21; May 2, 8, 16, 19, 26; June 3, 9, 18; between dawn and 1100 hours. Total party-hours: 28. **Census:** Carolina Wren, 11 (88, 35); Red-eyed Vireo, 11; Wood Thrush, 6 (48, 19); Ovenbird, 6; Cardinal, 6; Yellow-billed Cuckoo, 4 (32, 13); Acadian Flycatcher, 4; Carolina Chickadee, 4; Blue-gray Gnatcatcher, 4; Yellow-throated Vireo, 4; Tufted Titmouse, 3.5 (28, 11); Scarlet Tanager, 3.5; Hooded Warbler, 3 (24, 10); Summer Tanager, 3; Kentucky Warbler, 2.5 (20, 8); Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Pine Warbler, 2; Screech Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Broad-winged Hawk, +; Com. Flicker, +; Pileated Woodpecker, +; Yellow-throated Warbler, +; Blue Jay, +. **Total:** 28 species; 88.5 territorial males or females ( $705/\text{km}^2$ , 285/100 acres)

**Visitors:** Mourning Dove, Barred Owl, Ruby-throated Hummingbird, Com. Crow, Gray Catbird, Brown-headed Cowbird, Rufous-sided Towhee. **Remarks:** Seven nests were found: Broad-winged Hawk, Red-bellied Woodpecker (2), Wood Thrush, Red-eyed Vireo, Ovenbird and Summer Tanager. — *M. BIBEN, A. CAPARELLA, C. CHRISTENSEN, S. HALL, K. RABENOLD, D. RICHARDS, D. SCHROEDER, P. SPIEGEL, J. ROBINSON, J. RUSSELL, H. WILEY* (compiler), Dept. of Zoology, Univ. of North Carolina, Chapel Hill, N. C. 27514.

### 34. MIXED DECIDUOUS FOREST. —

**Location:** North Carolina; Orange Co., 4.5 mi. N of Chapel Hill on N.C. Highway 86; Duke Natural Area; 35°59'N, 79°04'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973; 4 consecutive years. **Size:** 8.8 ha = 21.8 acres. **Description of Plot:** See AB 27: 1018-1019 (1973). **Weather:** Warm winter and early spring preceded census; slightly drier than normal. **Coverage:** April 21, 27, 30; May 4, 15, 20, 27; June 2, 7, 30; July 9, 14; between 0630 and 0900 hours. Total man-hours: 18. **Census:** Red-eyed Vireo, 13 (147, 60); Carolina Wren, 6.5 (74, 30); Wood Thrush, 6.5; Acadian Flycatcher, 6 (68, 28); Ovenbird, 5 (57, 23); Red-bellied Woodpecker, 3 (34, 14); Carolina Chickadee, 3; Louisiana Waterthrush, 3; Tufted Titmouse, 2; Scarlet Tanager, 2; Cardinal, 2; Downy Woodpecker, 1; Hairy Woodpecker, 1; N. Parula, 1; Hooded Warbler, 1; Mourning Dove, +; Yellow-billed Cuckoo, +; Blue Jay, +; Com. Crow, +; Yellow-throated Warbler, +; Pine Warbler, +; Brown-headed Cowbird, +. **Total:** 22 species; 56 territorial males ( $635/\text{km}^2$ , 257/100 acres). **Visitors:** Bobwhite, Yellow-breasted

Chat, Com. Grackle, Indigo Bunting, Am. Goldfinch, Rufous-sided Towhee. **Remarks:** Nests located: Acadian Flycatcher 2, Wood Thrush 1, Ovenbird 1. The total number of territorial males has decreased from previous years, particularly in the less common species. Acadian Flycatcher dropped from 8 the past two years to 6. Yellow-billed Cuckoo, breeding on the site for the first time last year (2.5 males), reverted to its former peripheral status. — *MARK HUFF, LANCE PEACOCK, JOHN HORN* (compiler), Dept. of Botany, Duke Univ., Durham, N.C. 27706.

**35. UPLAND MIXED FOREST.** — **Location:** North Carolina; Wilkes Co., 0.25 mile from North Wilkesboro, just W of Finley Park. **Continuity:** Established 1954; 23 consecutive years. **Size:** 14 ha = 37 acres (formerly 40 acres but reduced by building and road construction). **Description of Plot:** See AFN 8: 367 (1954). **Coverage:** April 20; May 12; June 4, 6, 16, 27, 29; between 0930 and 1700 hours. Total: 14 man-hours. **Census:** Wood Thrush, 7 (47, 19); Cardinal, 7; Carolina Wren, 6 (40, 16); Rufous-sided Towhee, 5 (33, 14); Mourning Dove, 3 (20, 8); Com. Flicker, 3; Blue Jay 3; Red-eyed Vireo, 3; Com. Grackle, 3; Red-bellied Woodpecker, 2; Acadian Flycatcher, 2; Tufted Titmouse, 2; Yellow-billed Cuckoo, 1; Screech Owl, 1; Barred Owl, 1; Com. Crow, 1; Gray Catbird, 1; Brown Thrasher, 1; Am. Robin, 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1; Scarlet Tanager, 1. **Total:** 22 species; 56 territorial males ( $373/\text{km}^2$ , 151/100 acres). **Remarks:** Decline from 1975 of 12 territorial males. No change except for growth of forest and less ground cover. — *WENDELL P. SMITH, North Wilkesboro, N.C. 28659.*

**36. MOUNTAIN RAVINE MIXED FOREST.** — **Location:** Georgia; Rabun Co., headwaters of Cuttingbone Creek in the Chattahoochee National Forest, 4 mi. SSE of Clayton. **Continuity:** Established 1969; 8 consecutive years. **Size:** 5.9 ha = 14.7 acres (rectangular, 400 x 1600 ft, measured). **Description of Plot:** See AFN 23: 710-711 (1969). There have been no perceptible changes in the forest cover in the last year. **Coverage:** March 7, 28, April 2, 4, 9, 11, 15, 18, 22, 26, 29; May 2, 5, 9, 12, 15, 19, 22, 27, 30; June 1, 6, 10, 13, 15, 20, 23, 27, 30; July 4. Several trips were made before daylight, one in afternoon, the remainder between daylight and 0900. Total man-hours: 65. **Census:** Red-eyed Vireo, 7 (118, 48); Hooded Warbler, 6 (101, 41); Acadian Flycatcher, 5 (84, 34); Cardinal, 5; Carolina Chickadee, 3 (50, 20); Tufted Titmouse, 3; Black-and-white Warbler, 3; Worm-eating Warbler, 3; Black-throated Green Warbler, 3; Pileated Woodpecker, 2; Blue Jay, 2; Carolina Wren, 2; Wood Thrush, 2; Scarlet Tanager, 2; Hairy Woodpecker, 1; Downy Woodpecker, 1; Blue-gray Gnatcatcher, 1; Swainson's Warbler, 1; Pine Warbler, 1; Ovenbird, 1; Solitary Vireo, 0.5; Broad-winged Hawk, +; Screech Owl, +; Great Crested Flycatcher, +; Com. Crow, +; Louisiana Waterthrush, +. **Total:** 26 species; 54.5 territorial males ( $924/\text{km}^2$ , 371/100 acres.) **Remarks:** White-breasted Nuthatch, usually present, was missing this year. I am grateful to Louis Schweizer for his assistance on a number of trips. — *E. O. MELLINGER, Tiger, Ga. 30576.*

**37. MIXED HARDWOOD FOREST.** — **Location:** Ontario; Lambton Co., 9 mi. E of Sarnia; 1 mi S of Mandamin; 42°55'N, 82°15'W. **Continuity:** New. **Size:** 10.12 ha = 25 acres. **Description of Plot:** E-W, 920 ft, N-W, 1100 ft. Nature trail winds through the E part of the lot. Trees 3 inches in diameter and over on the basis of four 6.6 x 330 ft transects, 845/acre, total basal area 253 ft<sup>2</sup>/acre. Species comprising 86% of total number of trees: Figures after name of tree represent number of trees per acre, and relative density (%): Sugar Maple (*Acer saccharum*), 290, 34.3; Am. Basswood (*Tilia americana*), 150, 17.7; Am. Beech (*Fagus grandifolia*), 145, 17; White Ash (*Fraxinus americana*), 110, 13; Bitternut Hickory (*Carya cordiformis*), 85, 10; Hop Hornbeam (*Ostrya virginiana*), 65, 7.6; canopy cover 85%, canopy height 70 ft (60-100). **Edge:** Farmland N, S and W, with gravel road along E side and another woodlot of similar size on the NW corner, going N. **Topography:** Essentially flat. **Elevation:** 650 ft. **Weather:** Temperatures between 50-65°F. Sunny; rain on 3 trips. **Coverage:** May 15, 21, 30; June 2, 5, 8, 16-17, 20, 24, between 0500 and 0830 hours. Total man-hours: 18. **Census:** Blue Jay, 3 (30, 12); Song Sparrow, 3; Com. Flicker, 2; Red-headed Woodpecker, 2; Am. Robin, 2; Wood Thrush, 2; Ovenbird, 2; Com. Grackle, 2; Brown-headed Cowbird, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Cardinal, 1.5; Red-tailed Hawk, 1; Killdeer, 1; Mourning Dove, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Tree Swallow, 1; Com. Crow, 1; Brown Thrasher, 1; Starling, 1; Yellow-throated Vireo, 1; Chestnut-sided Warbler, 1; N Oriole, 1; Indigo Bunting, 1; Am. Woodcock, 0.5; Traill's Flycatcher, 0.5; House Wren, 0.5; Gray Catbird, 0.5; Great Blue Heron, +; Turkey Vulture, +; Bobwhite, +; Ruby-throated Hummingbird, +; Great Crested Flycatcher, +; Brown Creeper, +; Hermit Thrush, +; Swainson's Thrush, +; Yellow Warbler, +; Cape May Warbler, +; Black-throated Green Warbler, +; Red-winged Blackbird, +; Scarlet Tanager, +; Am. Goldfinch, +. **Total:** 44 species; 41.5 territorial males ( $410/\text{km}^2$ , 166/100 acres). **Remarks:** Nests located: Red-tailed Hawk, 1; flicker, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Tree Swallow, 1; Com. Crow, 1; Brown Thrasher, 1; Starling, 1; Yellow-throated Vireo, 1; towhee, 1. Young seen flicker, 3; Red-headed Woodpecker, 3; Red-tailed Hawk, 2; Blue Jay, 2; N. Oriole, 1; Cardinal, 1. Song Sparrow and Cardinal seen feeding young cowbirds. Special thanks to Gerry Clements for his assistance with the botany. — *TONY ROACH, 288 Essex St., Sarnia, Ontario, Canada.*

**38. WOODED CITY RAVINE.** — **Location:** Ontario; York Co., Toronto, Moore Park Ravine, between Moore Ave. and Chorley Park; 43°41'N, 79°22'30"W. **Continuity:** Established 1966; 7 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 25:993 (1971). **Coverage:** May 22, 29; June 1, 4-5, 9, 14, 17; July 3, 10; between 0600 and 0930 hours. Total man-hours: 16. **Weather:** May and June trips mostly sunny, below 70°F. July trips warm, humid, cloudy. **Census:** Am. Robin, 6 (30, 12); Indigo Bunting, 6; Wood Thrush, 5 (25, 10); Starling, 4 (20, 8); Cardinal, 4; Great Crested Flycatcher, 3 (15, 6); Blue Jay, 3; Com. Grackle, 3; Mourning Dove, 2; E. Wood Pewee, 2; Black-capped

Chickadee, 2; Song Sparrow, 2; Com. Flicker, 1; Downy Woodpecker, 1; Red-eyed Vireo, 1; House Sparrow, 1; Red-winged Blackbird, 1; N. Oriole, 1; Brown-headed Cowbird, 1. **Total:** 19 species; 49 territorial males ( $245/\text{km}^2$ , 99/100 acres). **Remarks:** In 7 intermittent years, 26 species have bred in the plot. The average annual number of species has been 18.6 with a low of 17 (1971 and 1973) and a high of 20 (1972 and 1974); 13 species (69.8%) have bred all 7 years; 16 species (86%) have bred 5 years; 6 species bred one year only. Of those 4 species breeding more than once and less than 5 years, Gray Catbird decreased from 4 to zero over 4 years; Black-capped Chickadee has established itself since 1972; Red-eyed Vireo has registered as a breeder for the last 3 years. These figures indicate a stable environment. The long-term trend is to greater density of growth and gradual filling-in of areas once open. — *DONALD PACE and ERIC NASMITH* (compiler), 37 Pears Avenue, Toronto, Ontario, Canada, M5R 1S9.

### 39. MATURE MIXED HARDWOOD FOREST. —

**Location:** Michigan; Oakland Co., Southfield Civic Center Nature Area; 42°30'N, 83°15'W, Royal Oak Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 9.3 ha = 23 acres. **Description of Plot:** See AB 28:1005-1006 (1974). **Weather:** Temperatures ranged from 26° to 80°F; max. wind 15 mph. Heavy cloud cover on 6 trips and light snow on one, otherwise clear and calm. April was generally clear with above average temperatures; May was wet with below average temperatures. **Coverage:** April 1-2, 8, 13, 15, 27; May 4, 18, 20, 25; June 2, 7-8; between 0530 and 0745 or 2000 and 2115 hours, EDT. Total man-hours: 25. **Census:** Starling, 14 (150, 61); Com. Flicker, 9.5 (102, 41); Cardinal, 6.5 (70, 28); Downy Woodpecker, 5 (54, 22); Am Robin, 4.5 (48, 20); Song Sparrow, 4 (43, 17); Ring-necked Pheasant, 3 (32, 13); Red-headed Woodpecker, 3; Blue Jay, 3; Com. Crow, 3; Red-eyed Vireo, 3; Red-winged Blackbird, 3; Mallard, 2; Great Crested Flycatcher, 2; House Wren, 2; Gray Catbird, 2; Wood Thrush, 2; Ovenbird, 2; Am. Goldfinch, 2; Canada Goose, 1; Am. Kestrel, 1; Hairy Woodpecker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Veery, 1; Com. Yellowthroat, 1; Scarlet Tanager, 1; Indigo Bunting, 1; N. Oriole, +; Com. Grackle, +; Pine Siskin, +. **Total:** 33 species; 88 territorial males ( $945/\text{km}^2$ , 383/100 acres). **Remarks:** Nests found: Starling, 6; Com. Crow, 3; Canada Goose, 1; Am. Kestrel, 1; White-breasted Nuthatch, 1. Species showing increases: Starling, 13 to 14; Com. Crow, 2.5 to 3; Red-headed Woodpecker, 2 to 3; Blue Jay, 1 to 3; Red-eyed Vireo, 1 to 3; Wood Thrush, 1.5 to 2. Species showing substantial decreases: Cardinal 10.5 to 6.5; Downy Woodpecker, 7 to 5; Am. Robin, 6 to 4.5; Great Crested Flycatcher, 5 to 2; Indigo Bunting, 5 to 1; Com. Grackle, 2 to +. New species this year: White-breasted Nuthatch, Veery, Ovenbird, Com. Yellowthroat, N. Oriole, Scarlet Tanager, Pine Siskin. Species absent this year: Bobwhite, Spotted Sandpiper, Black-capped Chickadee, Rose-breasted Grosbeak. Although the Com. Flicker numbers were down slightly from last year (10.5 to 9.5) this species continued its increase over the 1975 census. Most other species that decreased from last year are on par with 1975 figures; however, the Com. Grackle has decreased from 3 in 1974

to + this year and appears to be using the area more for feeding than breeding. The Pine Siskin was heard and seen on 2 trips in April and assumed a nesting species, although no further evidence of nesting was noted. Pine Siskins were observed on other than census trips until May 24. We wish to extend our thanks to Southfield Civic Center for their continued support. — *BETTY CHALLIS, Oakland Audubon Society, 2335 Pontiac Lk Rd., Pontiac, Mich. 48054.*

### 40. OAK-HICKORY-MAPLE FOREST. —

**Location:** Illinois; McLean Co., Moraine View State Park, 3 mi. S of Ellsworth; T22N, R4E, SE  $\frac{1}{4}$ , Sec 34, Arrowsmith Quadrangle, USGS. **Continuity:** New Size: 13 ha = 32 acres (forest interior, encircled by a hiking trail with small stream along one side). **Description of Plot:** Undisturbed second growth woodland bordering small stream and extending upslope. Composition of upper canopy (20-30 m and 70% closed) based upon sample of 84 trees recorded at 10 m intervals on periphery of plot: Sugar Maple (*Acer saccharum*) 37%, Red Oak (*Quercus rubra*) 25%, White Oak (*Q. alba*) 17%, Am Basswood (*Tilia americana*), White Ash (*Fraxinus americana*), Green Ash (*F. pennsylvanica*) and Black Cherry (*Prunus serotina*) 5%, and Shagbark Hickory, Bitternut Hickory, and Red Elm < 1% each. Average dbh 9 inches (range 5-22). The middle story is composed primarily of Hop Hornbeam (*Ostrya virginiana*), with the herbaceous layer in mid-June being mostly of Wood Nettle (*Laportea canadensis*), Appended Waterleaf (*Hydrophyllum appendiculatum*), Virginia Creeper (*Parthenocissus quinquefolia*), Sweet Cicely (*Osmorhiza claytoni*), False Solomon's-seal (*Smilacina racemosa*), Greek Valerian (*Polemonium reptans*) and Sugar Maple seedlings. The nettle and waterleaf predominates along the stream with White Oak most abundant on the upper part. The middle layer is well developed on most of the area but nearly absent in one area, and the herbaceous layer is rich with a thick leaf and humus cover. **Topography:** Ground slopes upward gradually from stream. **Edge:** Surrounded by and part of a 35 ha tract of nearly undisturbed second growth forest, except for a hiking trail. **Coverage:** May 23, 27; June 15, 18, 22, 27. Total man-hours: 12. **Census:** Great Crested Flycatcher, 3 (23, 9); House Wren, 3, Am Woodcock, 2; Yellow-billed Cuckoo, 2; E. Wood Pewee, 2; Blue Jay, 2; Am. Robin, 2; Wood Thrush, 2; Indigo Bunting, 2; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Acadian Flycatcher, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Ovenbird, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Whip-poor-will, +; Com. Flicker, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 26 species; 40 territorial males ( $309/100 \text{ km}^2$ , 125/100 acres). — *DALE E BIRKENHOLZ, Ill. State Univ., Normal, Ill. 61761*

### 41. OAK-MAPLE FOREST AND EDGE. —

**Location:** Illinois; Champaign Co., Trelease Woods, 6 mi NE of Champaign. **Continuity:** Established 1927; 44 intermittent years. **Size:** 22.6 ha = 55 acres (rectangular, surveyed) plus 2.0 km = 1.25 miles of forest-edge. **Description of Plot:** See AFN 2:232-233 (1948) **Coverage:** April 15, 28; May 8, 25; June 3, 15, 23; July 2,

15, between 0700 and 1130 hours. Total man-hours: 43. The density of the forest-interior species has been calculated as the number of territorial males per square kilometer and 100 acres; the density of the forest-edge species as the number per kilometer and mile. **Census:** *Forest-Interior Species*: E. Wood Pewee, 7 (31, 13); House Wren, 7; Wood Thrush, 6 (27, 11); Red-eyed Vireo, 6; Red-bellied Woodpecker, 5 (22, 9); Great Crested Flycatcher, 5; Yellow-billed Cuckoo, 4 (18, 7); Downy Woodpecker, 3 (13, 5); Hairy Woodpecker, 2; Carolina Wren, 2; Black-billed Cuckoo, 1; Great Horned Owl, +; White-breasted Nuthatch, +. *Forest-edge Species*: Starling, 70 (35, 56); Indigo Bunting, 16 (8, 13); Blue Jay, 13 (6, 10); Am. Robin, 10 (5, 8); Cardinal, 7 (4, 6), Mourning Dove, 6 (3, 5); Com. Flicker, 6; Red-headed Woodpecker, 3 (2, 2); Gray Catbird, 3; Com. Yellowthroat, 3; Field Sparrow, 3; Brown Thrasher, 2 (1, 2); Rufous-sided Towhee, 2; N. Oriole, 1; Rose-breasted Grosbeak, 1; Song Sparrow, 1; Ring-necked Pheasant, +; Screech Owl, +; Com. Crow, +; Com. Grackle, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 13 species in forest-interior; 48+ territorial males ( $216+/\text{km}^2$ ,  $87+/100 \text{ acres}$ ); 22 species in forest-edge; 147+ territorial males ( $74+/\text{km}^2$ ,  $118+/\text{mile}$ ). **Remarks:** The number of male Wood Thrushes (6) recorded this year is the largest ever. — *S. CHARLES KENDEIGH and JOHN M. EDGINGTON, Vivarium Building, Univ. of Ill., Champaign, Ill. 61820.*

**42. UPLAND DECIDUOUS FOREST.** — **Location:** Illinois; Jackson Co., 3 mi. ESE of Makanda at SW tip of Little Grassy Lake;  $37^\circ 36' \text{N}$ ,  $89^\circ 09' 30'' \text{W}$ , Lick Creek Quadrangle, USGS. **Continuity:** New. **Size:** 6.15 ha = 15.2 acres (irregular, paced). **Description of Plot:** An upland forest timbered 10 to 15 years ago. The N facing slope of an intermittent stream is dominated by Silver Maple (*Acer saccharinum*) and Tulip-tree (*Liriodendron tulipifera*), mostly under 6 in. in diameter with a dense understory of sapling trees. The S facing slope is dominated by oaks and hickories mostly over 6 in. in diameter with a sparser understory. Dominant ground cover plants include Virginia Creeper (*Parthenocissus quinquefolia*), Japanese Honeysuckle (*Lonicera japonica*) and *Muhlenbergia* sp. Trees, 2-inches diameter and over, based on 15 0.1-acre circular samples, 289/acre; total basal area  $57.3 \text{ ft.}^2/\text{acre}$ . Species comprising 90% of the total number of trees (figures give number of trees/acre, relative density (%), relative dominance, frequency): Silver Maple, 60, 21, 21, 73; White Oak (*Quercus alba*), 44, 15, 37, 73; Winged Elm (*Ulmus alata*), 33, 12, 5, 60; Tulip-tree, 23, 8, 2, 40; Pignut Hickory (*Carya glabra*), 22, 8, 5, 73; Black Gum (*Nyssa sylvatica*), 19, 7, 6, 47; White Ash (*Fraxinus americana*), 14, 5, 8, 53; Mockernut Hickory (*C. tomentosa*), 13, 5, 6, 40; Black Oak (*Q. velutina*), 12, 4, 1, 53; Bitternut Hickory (*C. cordiformis*), 10, 4, 1, 47; Shagbark Hickory (*C. ovata*), 7, 2, 3, 40. Trees by diameter size class (figures give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (2-6 in.) 183, 63, 16, 17; B (6-10 in.) 50, 17, 17, 18; C (10-14 in.) 35, 12, 28, 30; D (14-18 in.) 17, 6, 24, 26; E (18-22 in.) 3, 1, 7, 8. Shrub stems/acre, 5500; ground cover 46%; average canopy height 39 ft (range 30-50). **Edge:** Separated by at least 50 ft of similar habitat from shrubby fields on N, S and W

and from wooded lakeshore on E. **Topography:** Steep, rocky drainage basin of an intermittent stream. **Elevation:** 510-590 ft. **Weather:** Below normal precipitation during the period. **Coverage:** May 18, 20, 28; June 7, 9-10; 5 trips between 0500 and 0700, 2 in evening. Total man-hours, 12. **Census:** Kentucky Warbler, 6 (98, 39), Wood Thrush, 5 (81, 33); Acadian Flycatcher, 4 (65, 26), Carolina Wren, 3 (49, 20); Blue-gray Gnatcatcher, 3, Brown-headed Cowbird, 3 (females); N. Parula, 2, 5, Downy Woodpecker, 2; Summer Tanager, 2, 5; E. Wood Pewee, 2; Carolina Chickadee, 2; Tufted Titmouse, 2, Red-eyed Vireo, 2; Yellow-billed Cuckoo, 1; Whip-poor-will, 1; Red-bellied Woodpecker, 1; Great Crested Flycatcher, 1; White-breasted Nuthatch, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Black-and-white Warbler, 0.5; Bobwhite, +; Pileated Woodpecker, +, Blue Jay, +; Com. Crow, +. **Total:** 25 species; 46.5 territorial males ( $756/\text{km}^2$ ,  $306/100 \text{ acres}$ ). — *MICHAEL MORRISON and BRUCE PETERJOHN, Southern Ill Bird Observatory, P.O. Box 2471, Carbondale, Ill. 62901*

**43. BLACK OAK-SASSAFRAS WOODS.** — **Location:** Indiana; Porter Co., 1 mi. E intersection of Rtes 49 and 12, within Indiana Dunes National Lakeshore. Area crossed by tarred country road and lightly-used bridle path.  $41^\circ 39' \text{N}$ ,  $87^\circ 02' \text{W}$ , Dune Acres Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 22.22 ha = 54.9 acres (weighed map pieces) **Description of Plot:** Burned over (1971) wooded dune and sand prairie area making strong recovery after fire. Some areas impenetrable now. Park has removed some large dead trees. See *AB* 28:6, 1007 (1974). **Weather:** Good except for early May frosts. **Coverage:** April 4 to July 26; 23 trips, majority before 0900 hours. Total hours: 51. **Census:** Com. Yellowthroat, 9 (40, 16), Rufous-sided Towhee, 9; Field Sparrow, 9; Gray Catbird, 8 (36, 15); Brown Thrasher, 7 (31, 13); Golden-winged Warbler, 4 (18, 7); Com. Flicker, 2; Great Crested Flycatcher, 2; House Wren, 2; E. Bluebird, 2, Cardinal, 2; Bobwhite, 1; Am. Woodcock, 1; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Black-capped Chickadee, 1; Veery, 1; Yellow-throated Vireo, 1; Blue-winged Warbler, 1; E. Meadowlark, 1; Scarlet Tanager, 1; Indigo Bunting, 1. **Total:** 22 species; 67 territories ( $302/\text{km}^2$ ,  $122/100 \text{ acres}$ ). First bluebirds in at least 8 or 9 years nested this year. Nests located: flicker, Red-headed Woodpecker, bluebird. — *EMMA B PITCHER, 1159 E. 56th Street, Chicago, Ill. 60637.*

**44. PIN OAK FOREST.** — **Location:** Indiana, Spencer Co., 3 mi. NE of Rockport;  $37^\circ 55' \text{N}$ ,  $87^\circ 02' \text{W}$ , Rockport Quadrangle, USGS. **Continuity:** New. **Size:** 6.9 ha = 17 acres (irregular rectangle, measured with steel tape). **Description of Plot:** The dominant trees are Pin Oak (*Quercus palustris*), Sweet Gum (*Liquidambar styraciflua*), and Red Maple (*Acer rubrum*). Other less common species include Swamp White Oak (*Q. bicolor*), Black Gum (*Nyssa sylvatica*), and Black Cherry (*Prunus serotina*). Japanese Honeysuckle (*Lonicera japonica*) and Poison Ivy (*Rhus radicans*) are extremely abundant and often prevent the growth of herbaceous plants and tree seedlings. **Edge:** Bordered on all sides by cultivated fields except for 3 acres of similar forest on the NE corner. **Topography:** Essentially flat, with a low area along the N edge (45 x 350 ft.) containing 3-6 in. of water in the

spring and fall. **Elevation:** 390 ft. **Weather:** Temperatures 65°-85°F. **Coverage:** June 4-5, 7-8, 15, 17, 22, 29-30; July 2; between 0755 and 0930. Total man-hours: 7.5. **Census:** Tufted Titmouse, 2; Carolina Wren, 2, Cardinal, 2; Rufous-sided Towhee, 2; Mourning Dove, 1, Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1, Red-eyed Vireo, 1; Indigo Bunting, 0.5. **Total:** 12 species; 15.5 territorial males (225/km<sup>2</sup>, 91/100 acres). **Remarks:** Nests found: Mourning Dove, 1; Great Horned Owl, 1. In early June there was a large emergence of Periodical Cicada. This is part of a continuing study to investigate and monitor the environmental conditions in the vicinity of a proposed power plant in the American Electric Power System. — JOHN BELL, RANDALL COOLEY, WILLIAM MCCLAIN, RANDALL MAN-NING, RR 2, WAPORA, Inc., Charleston, Ill. 61920.

**45. MIXED HARDWOOD REGENERATING.** — **Location:** Ohio; Fairfield Co., Bern Township, 1 mi. W of Sugar Grove and 6 mi. S of Lancaster; 82°30'W, 39°37'30"N, NE/4 Lancaster Quadrangle, USGS. **Continuity:** New. **Size:** 20.2 ha = 50 acres (roughly rectangular 1400 x 1700 ft, with measuring wheel). **Description of Plot:** The dominant canopy trees are: White Oak (*Quercus alba*), N. Red Oak (*Q. rubra* var. *borealis*), Black Oak (*Q. velutina*), Pitch Pine (*Pinus rigida*), Tulip-tree (*Liriodendron tulipifera*), Black Birch (*Betula lenta*), Bigtooth Aspen (*Populus grandidentata*), and Rock Chestnut Oak (*Q. prinus*). The understory is composed of Flowering Dogwood (*Cornus florida*), Sassafras *albidum*, Red Maple (*Acer rubrum*), and Sourwood (*Oxydendrum arboreum*). The ground cover is primarily Poison Ivy (*Rhus radicans*), Christmas Fern (*Polystichum acrostichoides*), Maple-leaf Viburnum (*Viburnum acerifolium*), Hydrangea and many small tree seedlings. A quantitative survey shows: trees 3-inches in diameter and over, based on 5 circular samples 466/acre; total basal area 152.4 ft<sup>2</sup>/acre. Species comprising 99% of the total number of trees: Flowering Dogwood, 88, 19, 6, 100; Black Birch, 72, 15.5, 13, 100; Sassafras, 68, 15, 5, 100; Sourwood, 66, 14, 6, 80; Pitch Pine, 44, 9, 14, 40; Tulip-tree, 32, 7, 15.5, 60; Bigtooth Aspen, 20, 4, 7, 40; Red Maple, 16, 3, 3, 100; Black Oak, 18, 4, 12, 20; Rock Chestnut Oak, 10, 2, 6, 20; Red Oak, 8, 2, 5, 60; White Oak, 6, 1, 2, 60; Pignut Hickory, (*Carya glabra*), 6, 1, 1, 40, E. Hemlock (*Tsuga canadensis*), 8, 2, 2, 20. Trees by diameter size class followed by numbers per acre, relative density (%), basal area (ft<sup>2</sup>/acre), relative dominance (%); A (3-6 in.) 190, 62.5, 14.5, 19; B (6-9 in.) 82, 18, 12, 16; C (9-15 in.) 72, 15.5, 29, 38; D (15-21 in.) 16, 3, 14, 19; E (21-27 in.) 4, 1, 6, 8. Ground cover varied from 30% to 90%; canopy cover from 60% to 90%; average canopy height 65 ft. **Edge:** Approximately 1 mi. from the N edge of unglaciated Ohio, immediately bordered on three sides by similar forest and on the fourth by a White Pine (*Pinus strobus*) stand. **Topography:** Unglaciated Black-hand Sandstone ravines with 20 to 50 ft cliff faces and steep slopes. **Elevation:** 8001096 ft. **Weather:** Normal. **Coverage:** May 25-June 15; 13 trips between 0630 and 1030 hours and 1 trip at 1500 hours. Total party-hours: 28 **Census:** Red-eyed Vireo, 11 (54, 22); Wood Thrush, 10 (49, 20); Acadian Flycatcher, 6 (30, 12); Worm-eating Warbler, 6; E. Wood Pewee, 5 (25, 10); Tufted Titmouse,

5; Ovenbird, 4 (20, 8); Kentucky Warbler, 4; Rufous-sided Towhee, 4; Great Crested Flycatcher, 3 (15, 6); Carolina Chickadee, 3; White-breasted Nuthatch, 3; Carolina Wren, 3; Scarlet Tanager, 3; Com. Flicker, 2; Hairy Woodpecker, 2; Downy Woodpecker, 2; Blue Jay, 2; Com. Crow, 2; Cardinal, 2; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; E. Phoebe, 1; Blue-gray Gnat catcher, 1; Black-and-white Warbler, 1; Cerulean Warbler, 1; Louisiana Waterthrush, 1; Hooded Warbler, 1; Turkey Vulture, +; Ruby-throated Hummingbird, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 34 species; 92 territorial males (455/km<sup>2</sup>, 184/100 acres)

**Remarks:** Nests found: Wood Thrush, 4; Red-eyed Vireo, 3; 17 nests were found of 10 different species Cowbird eggs were removed from 2 of the Red-eyed Vireo nests. — ANN BINGAMAN (compiler), TOM WOOD, HERMAN KIND, JIM FRY, BRUCE STEHLING, RICK COUNTS and ESTHER REICHELDERFER, Ohio Historical Society, 1982 Velma Avenue, Columbus, Ohio 43211.

**46. MIXED MESOPHYTIC FOREST.** — **Location:** Ohio; Pike Co., 7 mi. NW of Morgantown; 39°10'30"N, 83°12'30"W, Morgantown Quadrangle, USGS. **Continuity:** New. **Size:** 101.2 ha = 250 acres (determined by map and map scale). **Description of Plot:** A quantitative survey of the vegetation shows that on Mitchell Ridge the dominant canopy trees (followed by number per acre, density (%), dominance, and frequency) are: White Oak (*Quercus alba*), 74, 22.5, 26, 100; Chestnut Oak (*Q. prinus*), 68, 20.5, 26, 80; Sugar Maple (*Acer saccharum*), 44, 12.5, 9, 80; Red Maple (*A. rubrum*), 34, 11.5, 3, 60; Shagbark Hickory (*Carya ovata*), 32, 9.5, 11, 40; Black Oak (*Q. velutina*), 30, 8.5, 3, 60; Red Oak (*Q. rubra*), 16, 4.5, 5, 20; White Ash (*Fraxinus americana*), 12, 3.5, 2, 40; Sassafras *albidum*, 12, 3.5, 4, 40; Tulip-tree (*Liriodendron tulipifera*), 10, 3, 2, 20; Sycamore (*Platanus occidentalis*), 2, 0.5, 1, 20. The understory is compromised of 50% Am. Hornbeam (*Carpinus caroliniana*), 30% E. Redbud (*Cercis canadensis*), 15% Sugar Maple, and 5% White Ash. The ground cover is primarily Com Spicebush (*Lindera benzoin*), and young Am. Elm (*Ulmus americana*). On Greenbriar Ridge, which holds Wildcat Hollow Trail, the dominant canopy trees are Tulip-tree, 82, 23, 24, 100; Red Maple, 70, 18, 18, 80; Sugar Maple, 68, 19, 15, 80; Am. Beech (*Fagus grandifolia*), 32, 9, 11, 60; White Oak, 30, 8, 9, 60; Tupelo (*Nyssa aquatica*), 28, 8, 8, 40; Shagbark Hickory, 18, 5, 6, 40; White Basswood (*Tilia heterophylla*), 16, 5, 4, 40; Black Oak, 12, 4, 4, 40; and White Ash, 4, 1, 1, 20. The understory is 30% Am. Hornbeam, 20% Flowering Dogwood (*Cornus florida*), 20% E. Redbud, 20% Tall Paw-paw (*Asimina triloba*), 10% Tulip-tree. The ground cover is mostly Spicebush and Stinging Nettle (*Urtica urens*). On Mitchell Ridge canopy cover is 90%; the average height 105 ft (range 25-150 ft). Woody stems are estimated at 15.750/acre; ground cover 80%. On Greenbriar Ridge canopy cover 93%; average height 114 ft (range 90-160 ft). Woody stems under 3 inches dbh are estimated at 20,500/acre; ground cover, 78%; total trees/acre 360; basal area 117.1 ft<sup>2</sup>/acre. Trees comprising 90% of total trees by diameter size class followed by number per acre, relative density (%), basal area, and dominance: A (3-6 in.) 58, 16, 5.8, 4; B (6-9 in.)

30, 9, 8.4, 7; C (9-15 in.) 272, 75, 216.4, 89. Elsewhere are White Pine (*Pinus strobus*) and Red Pine (*P. resinosa*), with average dbh of 11 inches (50 ft tall), planted when Pike Lake was under development. Nestled into the woods are a nature center and 26 cabins. There is a very large area of mowed grass under the pines and throughout the park. The lake is surrounded by Eggleson, Greenbriar, and Mitchell ridges. **Edge:** Bordered on all sides by similar forest. **Topography:** Smooth, high, rolling hills. **Elevation:** 754-1237 ft. **Weather:** Very hot and humid throughout census. Between 89° and 102°F with rain on two days. **Coverage:** July 10-17; between 0600 and 1100 hrs. Total man-hours: 40. **Census:** Am. Robin, 13 (13, 5); Red-eyed Vireo, 7 (7, 2); Chipping Sparrow, 6 (6, 2); Acadian Flycatcher, 5 (5, 2); Wood Thrush, 4 (4, 1); Yellow-throated Warbler, 4; Mourning Dove, 3 (3, 1); Barred Owl, 3; E. Wood Pewee, 3; Scarlet Tanager, 3; Whip-poor-will, 2; Com. Flicker, 2; Downy Woodpecker, 2; Purple Martin, 2; Carolina Wren, 2; Gray Catbird, 2; Cedar Waxwing, 2; N. Parula, 2; House Sparrow, 2; Com Grackle, 2; Cardinal, 2; Am. Goldfinch, 2; Black-billed Cuckoo, 1; Chimney Swift, 1; Ruby-throated Hummingbird, 1; Belted Kingfisher, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Least Flycatcher, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Warbling Vireo, 1; Yellow Warbler, 1; Am. Redstart, 1; Red-winged Blackbird, 1; Indigo Bunting, 1; Starling, +; Ovenbird, +; Kentucky Warbler, +; Com. Yellowthroat, +; Rufous-sided Towhee, +. **Total:** 43 species; 90 territorial males (89/km<sup>2</sup>, 36/100 acres). **Remarks:** Nests found: robin, 2. Throughout Greenbriar and Mitchell Ridges huge stumps and trunks of Am. Chestnut (*Castanea dentata*) remain from trees killed by the blight. They are making a slow comeback at the foot of Mitchell Ridge near the lake. Special thanks to Kraig Haines for help with the habitat description and to Diane Burnside for help with information. — *CLIFF CATHERS, 24 Grecian Ave., Trotwood, Ohio 45426.*

**47. VIRGIN BEACH-MAPLE FOREST I.** — **Location:** Ohio; Preble Co., Hueston Woods State Park, 4 mi. N of Oxford near intersection of Brown and Main Loop Rds., E ½, SE ¼ Sec. 34, T6N, R1E, College Corner Quadrangle, USGS. **Continuity:** Established 1973; 4 consecutive years. **Size:** 6.1 ha = 15 acres (1045 x 625 ft rectangle measured with compass, transit, and steel tape and permanently marked). **Description of Plot:** See *AB* 28 1009-1010 (1974). **Weather:** Late spring and early summer were warm and unusually rainy. **Coverage:** May 5, 11, 13, 16, 18, 20, 22, 27; June 3, 5, 17, 22, 24; July 4; between 0530 and 0900 and 1900 and 2130. Total: 57 man-hours. **Census:** Red-eyed Vireo, 11 (181, 73); Acadian Flycatcher, 9 (148, 60); Blue-gray Gnatcatcher, 8 (132, 53); Cerulean Warbler, 6.5 (107, 43); Tufted Titmouse, 6 (99, 40); Cardinal, 5.5 (91, 37); Carolina Chickadee, 4 (66, 27); Carolina Wren, 4; Brown-headed Cowbird, 3.5 (58, 23); White-breasted Nuthatch, 3 (49, 20); Starling, 3; E. Wood Pewee, 2.5; Wood Thrush, 2.5; Indigo Bunting, 2.5; Com. Flicker, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Kentucky Warbler, 2; Great Crested Flycatcher, 1.5; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; House Wren, 1; Yellow-throated Vireo, 1; House Sparrow, 1; Scarlet Tanager, 1; Song Sparrow, 1; Great Horned Owl, 0.5;

Barred Owl, 0.5; Pileated Woodpecker, 0.5; Gray Catbird, 0.5; Ruby-throated Hummingbird, +; Ovenbird, +; Rufous-sided Towhee, +. **Total:** 33 species; 89.5 territorial males or females (1474/km<sup>2</sup>, 597/100 acres)

**Remarks:** Single nests of Ruby-throated Hummingbird, Red-bellied Woodpecker, Red-headed Woodpecker, Hairy Woodpecker, Downy Woodpecker, Acadian Flycatcher, Red-eyed Vireo and House Sparrow were found. Two pairs of Starlings were observed nesting in previously successful Red-headed Woodpecker nest holes. Young and adult Barred Owls and adult Great Horned Owls were observed during the early spring and summer. We thank John Coons and Louise Krupp for their field assistance and are grateful to the Ohio Department of Natural Resources for permission to make this study — *JON C. ZUCK, STEVEN R. BEISSINGER, and SALLY WATERHOUSE, Dept. of Zoology, Miami Univ., Oxford, Ohio 45056.*

#### 48. VIRGIN BEECH-MAPLE FOREST II. — Location:

Ohio; Preble Co., Hueston Woods State Park, 4 mi. N of Oxford near intersection of Brown and Main Loop Rds.; E ½ SE ¼ Section 34, T6N, R1E, College Corner Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (1045 X 625 ft rectangle measured by pacing with map and compass and temporarily marked). **Description of Plot:**

A virgin stand of beech and maple with a main canopy 100-150 ft and an understory 4-6 ft. It was grazed 40 years ago which thinned the understory. Since then, the forest has been undisturbed. Sugar Maple (*Acer saccharum*) and Am. Beech (*Fagus grandifolia*) occur by far in greatest frequency, density and size. Ohio Buckeye (*Aesculus glabra*), Spice-bush (*Lindera benzoin*), Slippery Elm (*Ulmus fulva*), and Blue Beech (*Carpinus caroliniana*) are found in smaller numbers and size. **Edge:** Two sides are bordered by beech-maple woods of similar age and structure. Only narrow forest buffer zones separate one 1045 ft side and one 625 ft side from old field and young forest communities respectively.

**Topography:** A rolling upland surface dissected by several small streams. The area is Russell silt loam and part of the Wisconsin till plain. **Elevation:** 1000 ft. **Weather:** An unseasonably dry and early spring produced early migrations which were slowed by an early May cold spell. Late spring and early summer were warm and unusually rainy. **Coverage:** May 8, 20, 25; June 5, 8-9, 17, 21, 29; between 0530-0900 and 1900 and 2230 Total: 28 man-hours. **Census:** Acadian Flycatcher, 8 (132, 53); Blue-gray Gnatcatcher, 8; Red-eyed Vireo, 5 5 (91, 37); Cardinal, 5 (82, 33); Carolina Chickadee, 4 5 (74, 30); White-breasted Nuthatch, 3.5 (58, 23); Tufted Titmouse, 3 (49, 20); Red-bellied Woodpecker, 2.5; Downy Woodpecker, 2.5; Carolina Wren, 2.5; Indigo Bunting, 2.5; Com. Flicker, 2; Red-headed Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Yellow-throated Vireo, 2; Cerulean Warbler, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; Rufous-sided Towhee, 2; Yellow-billed Cuckoo, 1; Com. Crow, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Pileated Woodpecker, 0.5. **Total:** 25 species; 70 territorial males or females (1153/km<sup>2</sup>, 467/100 acres)

**Remarks:** A roost of 50 Turkey Vultures was located within the plot. The census is part of the author's Master's degree thesis which analyzes the effects of urbanization on bird communities. Thanks to Jon Zuck,

Louise Krupp, Bonnie Smith, John Coons and Coral Nunnery for their field assistance, and to the Ohio Department of Natural Resources for permission to make this study.—*STEVEN R. BEISSINGER, Dept. of Zoology, Miami Univ., Oxford, Ohio 45056.*

**49. MAPLE-GUM-HICKORY FOREST.** — **Location:** Tennessee; Campbell Co., 4 mi. W of Caryville; 36°18'N, 84°15'W, Block Quadrangle, USGS. **Continuity:** New. **Size:** 20 ha = 49.5 acres (rectangle, surveyed). **Description of Plot:** Second growth forest, downhill approx. 350 ft from a 23-year old strip mine. Two small streams run diagonally across the plot. Many overgrown logging trails are present. The dominant trees are Sugar Maple (*Acer saccharum*), Black Gum (*Nyssa sylvatica*), and Bitternut Hickory (*Carya cordiformis*). The under-story consists mostly of the above species and Flowering Dogwood (*Cornus florida*). Ground cover is mostly *Trillium* spp., Blue Cohosh (*Caulophyllum thalictroides*), and Black Snakeroot (*Zigadenus densus*). A quantitative survey of the vegetation gave the following: Trees, of 3 inches diameter and over, based on five 0.1-acre circles, 312/acre; total basal area 128 ft<sup>2</sup>/acre. Tree species comprising 90% of the total: Sugar Maple, 66, 21, 17, 100; Black Gum, 50, 16, 15, 80; Bitternut Hickory, 34, 11, 24, 80; Basswood (*Tilia heterophylla*), 24, 8, 3, 60; Tulip-tree (*Liriodendron tulipifera*), 20, 6, 4, 60; dead trees, 16, 5, 5, 60; Chestnut Oak (*Quercus prinus*), 14, 4, 15, 60; Flowering Dogwood, 14, 4, 1, 80; Red Oak (*Q. rubra*), 12, 4, 3, 40; Black Locust (*Robinia pseudo-acacia*) 12, 4, 1, 40; Sweet Buckeye (*Aesculus octandra*), 8, 3, 1, 60; White Oak (*Q. alba*), 6, 2, 4, 40; Black Cherry (*Prunus serotina*), 6, 2, 1, 60. Trees by diameter size class: A (3-6 in.) 182, 58, 18.2, 14; B (6-9 in.) 68, 22, 20.4, 16; C (9-15 in.) 36, 12, 28.8, 23; D (15-21 in.) 18, 6, 32.4, 25; E (21-27 in.) 6, 2, 18.6, 15; F (27-33 in.) 2, 1, 9.8, 8. Shrub stems/acre 4660; ground cover 65%; canopy cover 85%; canopy height 70 ft (range 50-90). **Edge:** Surrounded by similar forest on all sides except for strip mine parallel to the W boundary. **Topography:** Steep, rocky. **Elevation:** 1900-2300 ft. **Weather:** Below normal rainfall preceding and during census. **Coverage:** May 20-23, 26; June 4-6; dawn to 1030. Total man-hours: 30. **Census:** Hooded Warbler, 31 (155, 63); Am. Redstart, 26 (130, 53); Cerulean Warbler, 22 (110, 44); Red-eyed Vireo, 19 (95, 38); Kentucky Warbler, 15 (75, 30); Wood Thrush, 11 (55, 22); Worm-eating Warbler, 9 (45, 18); Scarlet Tanager, 8 (40, 16); Black-and-white Warbler, 6 (30, 12); Tufted Titmouse, 4.5 (22, 9); Yellow-throated Vireo, 4.5; Acadian Flycatcher, 4 (20, 8); Carolina Chickadee, 3 (15, 6); Blue-gray Gnatcatcher, 3; White-breasted Nuthatch, 2.5; Cardinal, 2.5; Downy Woodpecker, 2; E. Phoebe, 2; Brown-headed Cowbird, 2; Carolina Wren, 1.5; Red-tailed Hawk, 1; Broad-winged Hawk, 1; Yellow-billed Cuckoo, 1; Barred Owl, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Blue Jay, 1; Am. Robin, 1; White-eyed Vireo, 1; Solitary Vireo, 1; Black-throated Green Warbler, 1. **Total:** 32 species; 191 territorial males (953/km<sup>2</sup>, 386/100 acres). **Remarks:** A portion of this plot (24 acres) was censused by Yehner, see *AB* 26:951-952 (1972). —*ALAN B. SMITH, Dept. of Zoology, Univ. of Tenn., Knoxville, Tenn. 37916.*

**50. MIXED-MESOPHYTIC HARDWOODS.** — **Location:** Alabama; Madison Co., about 5 mi. NE of New Market, S of Mountain Fork Creek; 34°57'5"N, 86°21'15"W, King Cove Quadrangle, USGS. **Continuity:** New. **Size:** 15.75 ha = 38.92 acres (nearly rectangular, 625 x 225-275 m with 25 m grid; long axis nearly NW-ESE paralleling topographic features). **Description of Plot:** Part of an extensive forested region with no recent logging activity. A quantitative survey based on 11 randomly chosen 25 m square plots gave the following results: Trees 3 inches dbh and over, 251/acre; total basal area 84.8 ft<sup>2</sup>/acre. Species comprising 96% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%) in that sequence): Sugar Maple (*Acer saccharum*), 98, 39, 21, 100; hickories (mostly Shagbark Hickory, *Carya ovata*), 89, 21, 34, 100; ashes (*Fraxinus americana* and *quadrangulata*), 22, 9, 4, 64; Yellow Buckeye (*Aesculus octandra*), 15, 6, 12, 82; Chinquapin Oak (*Quercus muehlenbergii*), 9, 4, 6, 64; Hop Hornbeam (*Ostrya virginiana*), 9, 4, 1, 64; basswood (*Tilia* sp.), 8, 3, 3, 55; dead trees, 6, 2, 2, 45; Chestnut Oak (*Q. prinus*), 5, 2, 3, 36; White Oak (*Q. alba*), 4, 2, 4, 18; N Red Oak (*Q. rubra*), 4, 2, 2, 36; *Sassafras albidum*, 4, 2, 0, 9; Flowering Dogwood (*Cornus florida*), 3, 1, 0, 27; Beech (*Fagus grandifolia*), 2, 1, 3, 18. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft.<sup>2</sup>/acre, relative dominance): A (3-6 in.) 134, 54, 13.4, 16; B (6-9 in.) 58, 23, 17.4, 2; C (9-15 in.) 52, 21, 41.6, 49; D (15-21 in.) 6, 2, 10.8, 12; E (21-27 in.) 1, 0, 3.1, 2. Sapling stems 1-3 in. dbh total 248/acre; they are 60% Sugar Maple, 15% ashes, and 25% other species. Important species of shrubs and woody vines are Poison Ivy (*Rhus radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), S Arrowwood (*Viburnum dentatum*), Am. Strawberry-bush (*Euonymus americanus*), and wild grape (*Vitis* spp.). Herbaceous species are very numerous. Ground cover ranges from about 25% to about 80%; canopy cover about 60-70%; canopy height about 40-75 ft. A few old logging trails and temporary brooks cross the plot; fallen trees and old logs are frequent. **Edge:** Bordered on all sides by similar forest; the N side has only a strip of similar forest about 50 m wide separating it from bottomland woods and pastures along Mountain Fork Creek. **Topography:** N to NE facing slope, with some low outcrops and blocks of limestone in places. **Elevation:** 800-1100 ft. **Weather:** Relatively cool and very wet; three visits were abruptly terminated by heavy showers. **Coverage:** May 3, 12-13, 15-19; between 0530 and 1630 CDT. Total man-hours: 21+. **Census:** Red-eyed Vireo, 11.5 (73, 30); Blue-gray Gnatcatcher, 10 (63, 26); Carolina Wren, 5 (32, 13); Red-bellied Woodpecker, 3 (19, 8); Cerulean Warbler, 3; Downy Woodpecker, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Am. Redstart, 2; Acadian Flycatcher, 1.5; Carolina Chickadee, 1.5; Scarlet Tanager, 1.5; Cardinal, 1.5; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Yellow-throated Vireo, 1; Hooded Warbler, 1; Pileated Woodpecker, 0.5; Louisiana Waterthrush, 0.5; Kentucky Warbler, 0.5; Broad-winged Hawk, +; Blue Jay, +; Indigo Bunting, +. **Total:** 24 species; 53 territorial males (336/km<sup>2</sup>, 136/100 acres) **Remarks:** The low density was a surprise, as was the lack

of Wood Thrushes. Nests found: 1 hole each of Red-bellied and Downy Woodpeckers. — *RICHARD W. SIMMERS, JR.*, 62 Buckingham St., Cambridge, Mass. 02138

**51. FLOODPLAIN FOREST: DREDGED MATERIAL DISPOSAL SITE.** — **Location:** Louisiana; St. Martin Parish; Atchafalaya Basin; 30°23'N, 91°39'W, Maringouin Quadrangle, USGS. **Continuity:** New (1975). **Size:** 7.6 ha = 18.94 acres (2 transect lines; line A is 300 ft W of LA 975, 200 ft E of Whiskey Bay Pilot Channel (WBPC), and 2 mi. N of I-10, oriented N63°W (true); line B is 375 ft E of LA 975, 875 ft E of WBPC, and 1.1 mi. NW of I-10, oriented N29°W (true); both lines 2750 x 150 ft, paced with compass). **Description of Plot:** Vegetation was sampled in July 1974 using a random quadrat method for shrubs and herbaceous plants and the Bitterlich method for trees. Dredged material was deposited during construction of the WBPC in 1935 and 1936. A very minor disposal also took place in 1962 when the channel was subject to maintenance dredging. Re-establishment and growth of vegetation on the dredged material has been rapid. Black Willow (*Salix nigra*)-Sycamore (*Platanus occidentalis*) and Bald Cypress (*Taxodium distichum*)-Green Ash (*Fraxinus pennsylvanica*) associations have developed on the lower elevations and a Black Willow-Cottonwood (*Populus deltoides*) association on the higher elevations. The Black Willow-Sycamore association covers 80% (15.2 acres) of the plot. Rough-leaf Dogwood (*Cornus drummondii*) is the dominant understory species. Other important understory components are Wax Myrtle (*Myrica cerifera*) and saplings of Sweet Gum (*Liquidambar styraciflua*), Green Ash, and Sycamore. Blackberry (*Rubus argutus*) is the dominant shrub. Vines, particularly Rattan (*Berchemia scandens*), Poison Ivy (*Rhus radicans*), and Pepper Vine (*Ampelopsis arborea*), are abundant and present in the understory, shrub, and herbaceous layers. Prominent herbs are *Eupatorium album*, *Thelypteris normalis*, and *Microstegium vimineum*. Standing water is present during the winter and spring owing to flooding by the WBPC or poor internal and surface soil drainage. The tree canopy has a total of 238 stems/acre and a total basal area of 52.5 ft<sup>2</sup>/acre. Species composing 93% of the tree canopy (figures after each give relative density (%)) and relative basal area (%), in that sequence): Black Willow, 12.5, 23.5; Sycamore, 16.8, 16.6; Box-elder (*Acer negundo*), 12.3, 9.9; Red Elm (*Ulmus rubra*), 11.9, 8.8; Sweet Gum, 11, 6; Red Maple (*A. rubrum*), 10.2, 6; Cottonwood, 3.8, 11.8; Rough-leaf Dogwood, 7.7, 3.0; Green Ash, 6.8, 3. Percentage of trees sampled by diameter class A (3-6 in.), 25; B (6-9 in.), 19; C (9-15 in.), 36; D (15-21 in.), 12; E (21-27 in.), 0; F (27-31 in.), 2. Shrub stems/acre: 5589; ground cover 10%; canopy cover 75%; average canopy height 65 ft. The Black Willow-Cottonwood association comprises 14% (2.6 acres) of the plot. Common understory components are Rough-leaf Dogwood, Wax Myrtle, and saplings of Cottonwood, Boxelder, and Black Willow. Important shrubs, vines, and herb species are the same as those found in the Black Willow-Sycamore association. The tree canopy has a total of 251 stems/acre and a total basal area of 48 ft<sup>2</sup>/acre. Species comprising 94% of the tree canopy: Black Willow, 50.7, 47.2; Cottonwood, 27.5, 33.9; Boxelder, 8.2, 6.7; Rough-leaf Dogwood, 7.7, 3.4. Percentage

of trees sampled by diameter class: A, 32; B, 40; C, 23, D, 5. Shrub stems/acre: 3149; ground cover 26%, canopy cover 85%; average canopy height 50 ft. The Bald-Cypress-Green Ash association comprises 3% (0.6 acre) of the plot and is present in a depression on line A. Canopy cover is less than 20%, canopy height averages 30 ft., and dbh's are less than 6 in. The understory is mainly Black Willow. Standing water is present throughout the year except during droughts. Two 10 ft-wide surveyor cut lines and one 15 ft-wide access road to the WBPC cross line A and one 10 ft-wide surveyor cut line crosses line B, all create edge effects. A 0.2 acre clearing is present on line A and a 0.3 acre clearing is present on line B; both also create edge situations. **Edge:** Both transect lines are bordered by similar floodplain habitats. **Topography:** Gently rolling from N to S. Standing water was present in the Bald Cypress-Green Ash association and in poorly-drained sectors of the Black Willow-Sycamore association. **Elevation:** Varying from 15 to 45 ft. **Weather:** See Census 86. **Coverage:** May 7-14; between 0600 and 1000 Total man-hours: 40. **Census 1975:** White-eyed Vireo, 21 (274, 111); Cardinal, 14 (183, 74); Prothonotary Warbler, 10.5 (137, 55); N. Parula, 8 (104, 42); Red-eyed Vireo, 7.5 (98, 40); Hooded Warbler, 7 (91, 37); Yellow-breasted Chat, 5.5 (72, 29); Wood Thrush, 4 (52, 21); Yellow-billed Cuckoo, 3 (39, 16); Carolina Wren, 3; Brown-headed Cowbird (females), 3; Rufous-sided Towhee, 3; Acadian Flycatcher, 2; Green Heron, 1; Mississippi Kite, 1; Com Yellowthroat, 1; Indigo Bunting, 1; Red-bellied Wood-pecker, 0.5; Swainson's Warbler, 0.5; Hairy Wood-pecker, +. **Total:** 20 species; 96.5 territorial males or females (1259/km<sup>2</sup>, 510/100 acres). **Remarks:** Nests found (13): Prothonotary Warbler, 3; Cardinal, 3, Yellow-billed Cuckoo, 2; Mississippi Kite, 1; Green Heron, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Hooded Warbler, 1. One of the Prothonotary Warbler nests was parasitized by a Brown-headed Cowbird. Carolina Chickadees and Tufted Titmice were ranging widely, suggesting that they had hatched their young and were feeding as families. This census was performed in an effort to gather baseline data for description of plant and animal succession patterns on U.S. Army, Corps of Engineers (COE) dredged material disposal sites. The study was supported by the COE, Waterways Experiment Station, Vicksburg, MS under grant number DACW 39-74-C-0092. — *STEPHEN B. ATKINS, RONALD G. PSCION, DAVID M. DUOND, and STEVEN W. LEONARD, Coastal Zone Resources Corp., Wilmington, N.C. 28401.*

**52. VIRGIN SCRUB OAK FOOTHILLS.** — **Location:** Oklahoma; Osage Co., from intersection U.S. 60 and Okla. 123, 5 mi. W and 2.5 mi. SW; 96°06'N, 36°44'W, Woolaroc Quadrangle, 7.5 min. series USGS, SW one-fourth of SE quarter of section 10-26-11. **Continuity:** Established 1975. **Size:** 16.19 ha = 40 acres (square, original survey three sides, fourth side compassed). **Description of Plot:** See AB 29:1098 (1975) **Weather:** Dry mild spring, early season. **Coverage:** April 7, 14, 22, 29; May 5, 13, 19, 24, 28; June 11; between dawn and 1030, CDT. Total man-hours: 26. **Census:** Field Sparrow, 7 (43, 18); Great Crested Flycatcher, 4 (25, 10); Brown-headed Cowbird, 4; Tufted Titmouse, 3 (19, 8); Bewick's Wren, 3; Blue-gray Gnatcatcher, 3,

Black-and-white Warbler, 3; Cardinal, 3; Mourning Dove, 2; Carolina Chickadee, 2; Brown Thrasher, 2; Bobwhite, 1.5; Blue Jay, 1.5; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; E. Phoebe, 1; White-breasted Nuthatch, 1; Carolina Wren, 1, Yellow-breasted Chat, 1; Red-winged Blackbird, 1; Painted Bunting, 1; Lark Sparrow, 0.5; Black-billed Cuckoo, +; Screech Owl, +; Chuck-will's-widow, +; E. Meadowlark, +; Summer Tanager, +. **Total:** 30 species; 50.5 territorial males ( $312/\text{km}^2$ , 126/100 acres). **Remarks:** Field Sparrow population jumped from 3 to 7 over last year and Red-headed Woodpeckers dropped from 3 to 1. Total hole dwellers were about the same. — *ELLA DELAP and DOTTY M. GOARD, P.O. Box 591, Bartlesville, Okla. 74003.*

**53. MIXED DECIDUOUS-CONIFEROUS FOREST.** — **Location:** Maine; Penobscot Co., Woodland Preserve of the Univ. of Maine, Orono. See USGS Orono, Maine. **Continuity:** Established 1975 (1976); 2 years. **Size:** 10.4 ha = 25.6 acres (surveyed). **Description of Plot:** Covered by a canopy of White Pine (*Pinus strobus*), E. Hemlock (*Tsuga canadensis*), White and Red Spruce (*Picea glauca*, *P. rubens*), Red Maple (*Acer rubrum*), White Birch (*Betula papyrifera*), and Balsam Fir (*Abies balsamea*). White Pine and E. Hemlock are the dominant overstory species (est. 65%), while the rest dominate most (est. 30%) of the remaining area. The two dominants range up to 70 ft and 30 inches in diameter (dbh). Many hardwoods fill in open areas and border small stream tributaries. Streamside associates include White Ash (*Fraxinus americana*), Red Maple, Am. Elm (*Ulmus americana* — also many dead skeletons standing), and Speckled Alder (*Alnus rugosa*). Edge associates include Basswood (*Tilia americana*), Hop Hornbeam (*Ostrya virginiana*), Aspens (*Populus grandidentata*, *P. tremuloides*), Beech (*Fagus grandifolia*), Shadblush (*Amelanchier laevis*), Red Oak (*Quercus rubra*), Pin Cherry (*Prunus pensylvanica*), Black Cherry (*P. serotina*), Red Maple, White Spruce, White Pine, and Am. Elm. The understory and shrub layers are dominated throughout by conifers (Hemlock, Balsam Fir, Red and White Spruce), Red Maple, alders (wet areas), Beaked Hazelnut (*Corylus cornuta*), several Viburnums, Mountain Ash (*Pyrus americana*), Red Raspberry (*Rubus strigosus*), and Poison Ivy (*Rhus radicans*). Shrubs dominating along the forest edges are Beaked Hazelnut, Red Raspberry, Blackberry (*Rubus allegheniensis*), Honeysuckle (*Lonicera tatarica*), Bush Honeysuckle (*Diervilla lonicera*), Speckled Alder, hawthorn (*Crataegus* sp.), Elderberries (*Sambucus canadensis*, *S. pubens*), and willows (*Salix* spp.). The herbaceous layer is generally open (est. 65% moss and duff cover) with a mosaic of associations of ferns (12 species), herbs, sedges, grasses, and wood-rushes. **Edge:** Bordered on the SE by an open field and a marshy area, on the SW by eight small cabins (student housing), on the E separated from a mobile home development by a secondary road, on the N by a mowed meadow and on the W by cowbarns and a sheep pasture. **Topography:** Gently sloping E and W from a weakly meandering stream which runs lengthwise N to S through the center of the plot. Superimposed on this is a slight N to S slope. A series of small tributaries drain W

to E from adjacent meadows. **Elevation:** 95 to 105 ft **1975: Weather:** 13 days clear, 5 overcast or ground fog, 2 days rain. Temperatures ranged from 47-64°F av = 54°F (8-18°C, av. = 12°C). **Coverage:** May 11, 22, 28; June 6-7, 10, 12, 17, 19-21, 23, 26-28; July 2, 11, 14-15, 25; between 0440 and 0800. Total: 35 man-hours. **Census:** Red-eyed Vireo, 9 (87, 35); Ovenbird, 9; Yellow-rumped Warbler, 7 (68, 27); Golden-crowned Kinglet, 6 (58, 23), Pine Warbler, 6; Black-capped Chickadee, 5 (48, 20), Am Robin, 5; Song Sparrow, 5; Red-breasted Nuthatch, 4 (39, 16); Wood Thrush, 4; Veery, 4; Black-throated Green Warbler, 4; Com. Grackle, 4; Blue Jay, 3 (29, 12), Am. Goldfinch, 3; E. Wood Pewee, 2; Com. Crow, 2, Hermit Thrush, 2; Black-and-white Warbler, 2, Com Flicker, 1; Ruby-crowned Kinglet, 1; Canada Warbler, 1; Am. Redstart, 1; Purple Finch, 1; Chipping Sparrow, 1; White-throated Sparrow, 1. **Total:** 26 species; 93 territorial males ( $898/\text{km}^2$ , 363/100 acres). **Remarks:** Nests found: Song Sparrow, 1. **1976: Weather:** 4 days clear, 2 ground fog, 1 overcast. **Coverage:** May 30; June 5-6, 13, 18; July 7-8, 18; between 0430 and 0900. Total: 18 hours. **Census:** Ovenbird, 7 (68, 27); Black-capped Chickadee, 4 (39, 16); Am. Robin, 4; Red-eyed Vireo, 4; Black-and-white Warbler, 4; Yellow-rumped Warbler, 4; Black-throated Green Warbler, 3 (29, 12); Pine Warbler, 3, Canada Warbler, 3; White-throated Sparrow, 3, Com Grackle, 3; Blue Jay, 2; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Tree Swallow, 1; Com. Crow, 1; Red-breasted Nuthatch, 1; Wood Thrush, 1; Starling, 1; Red-winged Blackbird, 1; Purple Finch, 1; Am. Goldfinch, 1; Chipping Sparrow, 1; Song Sparrow, 1. **Total:** 26 species, 58 territorial males ( $560/\text{km}^2$ , 227/100 acres). **Remarks:** Of note is the absence in 1976 of kinglets, Veeries, and Hermit Thrushes, and the decline in the number of Red-eyed Vireos and of Wood Thrushes. Grateful acknowledgement is made to Norman C. Famous for assistance in the botanical analysis, to A. A. Barden, Jr. for review of the manuscript and help in obtaining some field materials, and to Pete Robinson and Michael Hazlett for their assistance setting up transects. — *NONA FAMOUS, 9-G Talmar Wood, Orono, Me. 04473.*

**54. DECIDUOUS — CONIFEROUS SECOND-GROWTH NORTHWOODS.** — **Location:** Vermont, Washington Co., SW corner Cabot; 44°23'N, 72°23'W, Plainfield Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 15 ha = 37 acres. **Description of Plot:** See AB 26:957-8, (1972). **Coverage:** May 1 to June 7; 18 mostly early morning trips. Total man-hours: 20.5 **Weather:** Temperature range 32°-55°F, (average 42.8°), 55% clear. **Census:** Ovenbird, 3 (20, 8), White-throated Sparrow, 3; Nashville Warbler, 2.5, Winter Wren, 2; Wood Thrush, 2; Veery, 2; Ruby-crowned Kinglet, 2; Magnolia Warbler, 2; Black-throated Blue Warbler, 2; Chestnut-sided Warbler, 2, Com. Yellowthroat, 2; Canada Warbler, 2; Song Sparrow, 2; Solitary Vireo, 1.5; Blue Jay, 1; Black-capped Chickadee, 1; Red-breasted Nuthatch, 1; Am. Robin, 1, Golden-crowned Kinglet, 1; N. Parula, 1; Black-throated Green Warbler, 1; Bay-breasted Warbler, 1; Chipping Sparrow, 0.5. **Total:** 23 species; 38.5 territorial males ( $257/\text{km}^2$ , 104/100 acres). **Remarks:** Two nests were found: Blue Jay and White-throated Sparrow. This year I found about half as many territorial males as recorded in

1974 White-throated Sparrow was down from 13 to 3. In 1972 there were 11 species with 3 or more territorial males, this year there were only 2. — BARBARA CARPENTER, Marshfield, Vt. 05658.

**55. BURNED PINE-OAK FOREST.** — **Location:** Massachusetts; Plymouth Co., Pine Hills 0.5 mile S of Rte 3A; 41°56'N, 70°35'W, Manomet Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 22.5 ha = 55.6 acres (3 adjacent rectangles each 200 x 375 m with sides running N-S and E-W, surveyed). **Description of Plot:** See AB 29:1099-1100 (1975). **Weather:** A warm and very dry season, usually overcast cloud or haze during the censuses; wind 0 or light SW; temperature range 10°-22°C (50°-71°F). **Coverage:** June 3, 15, 19, 22-23, 25-26, 28-29; July 2, 7, 15. All visits began within 1 hour of dawn. Total man-hours: 54. **Census:** Ovenbird, 11.5 (51, 21), Rufous-sided Towhee, 8 (36, 14); Pine Warbler, 6.5 (29, 12); Black-and-white Warbler, 5 (22, 9); Blue Jay, 4+ (18, 7); Black-capped Chickadee, 3+ (13, 5); Com. Yellowthroat, 3 (13, 5); Ruffed Grouse, 2; Com. Flicker, 2, Whip-poor-will, 1+; Mourning Dove, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 0.5; Hermit Thrush, 0.5; Nashville Warbler, 0.5; Red-breasted Nuthatch, +; Am. Robin, +; Red-eyed Vireo, +; Com. Grackle, +; Am. Goldfinch, +. **Total:** 20 species; 49.5 territories (220/km<sup>2</sup>, 89/100 acres). **Remarks:** Nests found 1 Whip-poor-will (chick) and 1 Ovenbird. There was little change from the previous year. This census was carried out by 12 people from the Manomet Bird Observatory. Grateful thanks to the Dorr Foundation and the George I. Alden Trust for generous grants which helped to support the work. We are particularly indebted to Gordon L. Howland and Christopher Hussey who own the land and have actively supported this study. — TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.

**56. DECIDUOUS-CONIFEROUS LOW-LYING ISLAND.** — **Location:** Massachusetts; Plymouth Co., Halfway Pond, off Mast and Wareham Roads; 41°51'N, 70°37'W, Sagamore Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 5.06 ha = 12.5 acres (an irregular island in the center of the pond, surveyed). **Description of Plot:** See AB 29:1100 (1975). **Weather:** A warm and very dry season, usually overcast cloud or haze during the censuses, wind 0 or light SW (20 knots one day); temperature range 18°-22°C (64°-71°F). **Coverage:** May 27, 31, June 9, 15, 19, 23, 29; July 2-3, 8. All visits began within 1 hour of dawn. Total man-hours: 32. **Census:** Blue Jay, 2+; Com. Grackle, 2+; Com. Flicker, 2; E. Kingbird, 2; Black-capped Chickadee, 2; Gray Catbird, 2, Red-winged Blackbird, 2; Green Heron, 1; Ruffed Grouse, 1; Downy Woodpecker, 1; Am. Robin, 1; N. Oriole, 1; Song Sparrow, 1. **Total:** 13 species; 20 territories (395/km<sup>2</sup>, 160/100 acres). **Remarks:** Nests found one each of Com. Flicker, E. Kingbird, Gray Catbird, Com. Grackle, plus a brood of Ruffed Grouse. The 33% increase in territories over the 15 recorded in 1975 is probably not significant. This census was carried out by 15 people from the Manomet Bird Observatory. Grateful thanks to the Dorr Foundation and the George I. Alden Trust for generous grants which helped to support the work. We are particularly indebted to Mrs. Clarence E.

Bird for permission to survey her island. — TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.

**57. MAPLE — PINE — OAK SECOND-GROWTH FOREST.** — **Location:** Massachusetts; Norfolk Co., Town of Foxboro conservation land, off Willow and East Streets; 42°04'N, 71°11'30"W, Mansfield Quadrangle, USGS. **Continuity:** New. **Size:** 11.8 ha = 29.2 acres (irregular hexagon, approaching a rectangle with a N-S long dimension and beveled NE corner, from Tax Assessors's maps 1 in. = 80 ft). **Description of Plot:** Composed of pasturelands abandoned during this century, including areas with trees 50-60 and 20-30 years old. One central acre has scattered trees 7 years old and is covered mostly with *Spirea* sp. and Sheep Laurel (*Kalmia angustifolia*). A small stream (Canoe River) divides the plot in half. Approximately three acres were under standing water during May, but were dry by June 15. The dominant canopy trees are Red Maple (*Acer rubrum*), White Pine (*Pinus strobus*) and White Oak (*Quercus alba*). The dominant shrubs are trees less than 3 in diameter, *Clethra alnifolia*, Greenbrier (*Smilax rotundifolia*) and Highbush Blueberry (*Vaccinium corymbosum*). The ground cover is primarily seedling trees, Canada Mayflower (*Maianthemum canadense*), *Lycopodium complanatum*, Lowbush Blueberry (*Vaccinium cespitosum*) and various ferns. Skunk Cabbage (*Symplocarpus foetidus*) abounds in wet areas. A quantitative survey of the vegetation gave the following results: Trees, 3-inches diameter and over, based on eight 0.1-acre circular samples, 667/acre; total basal area 186.6 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Red Maple, 291, 44, 44, 100; White Pine, 138, 21, 18, 100, White Oak, 66, 10, 9, 75; dead trees, 66, 10, 7, 100; Gray Birch (*Betula populifolia*), 23, 4, 1, 50; Swamp White Oak (*Q. bicolor*), 17, 3, 7, 62. Trees by diameter size class: A (3-6 in.) 404, 61, 40.4, 22; B (6-9 in.) 176, 26, 52.6, 28; C (9-15 in.) 69, 10, 55.1, 30; D (15-21 in.) 17, 3, 30.4, 16; E (21-27 in.) 3, 0, 8.1, 4. Shrub stems/acre 3863, ground cover 50% canopy cover 80%; average canopy height 53 ft (range 35-55). **Edge:** Bordered on all sides by similar forest (extensively to the N and S). NE beveled edge is 200 ft from 300 ft wide powerline cut. NW and SW corners are about 100 ft from cleared land. **Topography:** Essentially flat. **Elevation:** 200 ft. **Weather:** Nearby Boston temperatures for May and June respectively were 1.6 and 5.5°F above average; rainfall 1.49 and 2.61 inches below average. **Coverage:** May 9, 14, 21-24, 26-27, 30-31; June 3-6, 8-10, 12-13, 22-23, 27; July 2, 9, between 0600 and 0930, plus three evening trips. Total man-hours: 66. **Census:** Blue Jay, 6 (51, 21); Gray Catbird, 6; Rufous-sided Towhee, 6; Ovenbird, 4.5 (38, 15), Black-capped Chickadee, 3 (25, 10); Com. Yellowthroat, 3; Scarlet Tanager, 3; Downy Woodpecker, 2; Veery, 2, Black-and-white Warbler, 2; Com. Grackle, 2; Wood Thrush, 1+; N. Oriole, 1+; Ruffed Grouse, 1; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Brown Thrasher, 1; Am. Robin, 1; Blue-winged Warbler, 1; Nashville Warbler, 1; Field Sparrow, 1; Song Sparrow, 1; Com. Flicker, 0.5; Hairy Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Broad-winged Hawk, +. **Total:** 29 species; 55 territorial males or

females ( $465/\text{km}^2$ , 188/100 acres). **Remarks:** The S boundary is a paved two-lane road with no shoulders. The tree canopy is nearly closed and no edge effect on the nesting population was noticed. The mixed habitat of this plot is typical of the forest areas in SE New England preserved from development owing to wetness. A Screech Owl was heard on two of the evening visits and may have nested. The 1-acre field was visited frequently by several species nesting in the open fields and power-line cut. — *WILLIAM E. DAVIS, JR., College of Basic Studies, Boston Univ., Boston, Mass. 02215.*

**58. PITCH PINE-SCRUB OAK FOREST V.** — **Location:** Massachusetts; Plymouth Co., Myles Standish State Forest, 1 mile SE of College Pond;  $41^\circ 52' \text{N}$ ,  $70^\circ 40' \text{W}$ , Wareham Quadrangle, USGS. **Continuity:** New **Size:**  $7.5 \text{ ha} = 18.53 \text{ acres}$  (an irregular right angle polygon with sides running N-S and E-W, surveyed). **Description of Plot:** The dominant tree (100%) was Pitch Pine (*Pinus rigida*), 96% of which was killed in 1971 and '72 by a massive infestation of Pitch Pine Looper (*Lambdina athasaria pellucidaria*). Scrub Oak (*Quercus ilicifolia*) was the only understory species, and the ground cover was predominantly Black Huckleberry (*Gaylussacia baccata*), Early Lowbush Blueberry (*Vaccinium vacillans*), and Late Lowbush Blueberry (*V. angustifolium*). A survey of 5 random  $25 \times 25 \text{ m}$  plots gave the following results: 18 live Pitch Pines ( $> 1 \text{ m}$ )/acre; 345 standing dead ( $> 1 \text{ m}$ )/acre; 146 lying dead ( $> 1 \text{ m}$ )/acre; 113 live shoots or seedlings/acre about 60 cm tall. Average height of live Pitch Pines ( $> 1 \text{ m}$ ) was 6.5 m, diameter 9.9 cm standing dead Pitch Pines ( $> 1 \text{ m}$ ) averaged 4.0 m in height (range 2-8 m), diameter 8.8 cm. (range 4.3-21.0 cm), lying dead pines averaged 3.7 m (range 3-6 m), diameter 5.8 cm (range 3.5-9.0 cm). Tree cover was 4.8%. Within these 5 random plots 5  $10 \times 10 \text{ m}$  samples gave 2161 Scrub Oak clumps/acre; average height 1.4; cover 49%. The herbaceous layer was censused by 25 random 1 m squares; average cover was 48%. **Edge:** Carefully chosen to ensure uniform habitat although live forest approached within 50 m at a few points. **Topography:** A very shallow bowl effect, the center lowered by circa 5 m. **Elevation:** 180 ft. **Weather:** Warm but exceptionally dry all spring and summer, usually overcast or hazy during the censuses; wind 0 or light S-W; temperature range  $13^\circ\text{-}21^\circ \text{C}$  ( $55^\circ\text{-}70^\circ \text{F}$ ). **Coverage:** June 16, 19, 22-23, 26, 29; July 1-2, 7, 10, 15. Total man-hours: 40. **Census:** Rufous-sided Towhee, 18 (240, 97); Prairie Warbler, 10.5 (140, 57); Com. Yellowthroat, 5 (67, 27); Field Sparrow, 2, Hermit Thrush, 1.5; Gray Catbird, 0.5; Mourning Dove, +; Com. Flicker, +; Hairy Woodpecker, +; E. Wood Pewee, +; Blue Jay, +; Com. Crow, +; Fish Crow, +, Black-capped Chickadee, +; House Wren, +; Brown Thrasher, +; E. Bluebird, +; Pine Warbler, +; N. Oriole, +; Com. Grackle, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 22 species; 37.5 territories ( $500/\text{km}^2$ , 202/100 acres). **Remarks:** Nests found: Hermit Thrush, (3), Rufous-sided Towhee, (1). A very late season as the drought killed the first shoots of the Scrub Oak and many herbaceous plants. The second attempt at foliage production was successful. Despite the lack of live trees, shrub nesting species were plentiful but no cavity nesters were yet established. This census was carried out by 12 people from the Manomet Bird Observatory. Grateful thanks to the Dorr Foundation and the George

I. Alden Trust for generous grants which helped to support the work. We are also indebted to staff of the Myles Standish State Forest for advice and encouragement — *TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.*

**59. CLIMAX HEMLOCK-WHITE PINE FOREST, WITH TRANSITION HARDWOODS.** — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield;  $41^\circ 43' 20'' \text{N}$ ,  $73^\circ 12' \text{W}$ , Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 10 intermittent years. **Size:**  $10.52 \text{ ha} = 26 \text{ acres}$  (roughly a trapezium). **Description of Plot:** See *AFN* 19:594-595 (1965) **Coverage:** May 24-25; June 5, 7, 12-13; from 0445 to 2300, with emphasis before 0600. Total man-hours 24 **Census:** Blackburnian Warbler, 9 (86, 35); Ovenbird, 7 (67, 27); Black-throated Green Warbler, 6 (57, 23), Veery, 5 (48, 19); Solitary Vireo, 5; Rufous-sided Towhee, 4 (38, 15); Black-capped Chickadee, 3 (29, 12), Brown Creeper, 3; Black-and-white Warbler, 3; Scarlet Tanager, 3; Blue Jay, 2.5; Red-breasted Nuthatch, 2, Wood Thrush, 2; Canada Warbler, 2; White-throated Sparrow, 2; Broad-winged Hawk, 1; Barred Owl, 1, Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; House Wren, 1; Winter Wren, 1; Am. Robin, 1; Red-eyed Vireo, 1, N Waterthrush, 1; Brown-headed Cowbird, 1; Cardinal, 1, Com. Crow, 0.5; White-breasted Nuthatch, 0.5, N Oriole, 0.5; Song Sparrow, 0.5; Pileated Woodpecker, +, Com. Flicker, +; Com. Yellowthroat, +; Purple Finch, + **Total:** 36 species, 73.5 territorial males ( $699/\text{km}^2$ , 283/100 acres). **Remarks:** The two new species, Winter Wren and N. Waterthrush, as well as both pairs of White-throated Sparrows, established territories in a low area where several softwoods and hardwoods of 125 years and younger were removed last year for sawmill purposes. The visual effect of this area is similar to a windfall. Special thanks to Jim Cavanaugh for his help — *ANDREW MAGEE, Woollybear, Troy, N. H. 03465.*

**60. UPLAND MIXED PINE-SPRUCE-HARDWOOD PLANTATION.** — **Location:** New York, Allegany Co., on the S side of Brown Rd., near its intersection with the Vandermark Rd., in the town of Ward, 3.5 miles W of Alfred,  $42^\circ 7' 30'' \text{N}$ ,  $77^\circ 45' \text{W}$ ; Andover Quadrangle, USGS. **Continuity:** Established 1974, 3 consecutive years. **Size:**  $16.6 \text{ ha} = 41 \text{ acres}$  (roughly rectangular; perimeter measured with tape and compass) **Description of Plot:** See *AB* 28:699 (1974). **Weather:** See Census 68. **Coverage:** May 10, 15, 21, 27; June 6, 9, 13, 15, 19, 25, 28; July 16, 20, 26; from 0745 to 2100, EDT Total man-hours: 22. **Census:** Magnolia Warbler, 15 (90, 37); Black-throated Green Warbler, 15; Blackburnian Warbler, 15; Golden-crowned Kinglet, 12 (72, 29), Dark-eyed Junco, 8 (48, 20); Black-capped Chickadee, 5 (30, 12); Blue Jay, 3 (18, 7); Wood Thrush, 3; Solitary Vireo, 3; Ovenbird, 3; Am. Robin, 2.5; Veery, 2; Cedar Waxwing, 2; Com. Yellowthroat, 2; Canada Warbler, 2, Indigo Bunting, 2; White-throated Sparrow, 2; Song Sparrow, 2; Yellow-rumped Warbler, 1.5; Hairy Woodpecker, 1; Red-breasted Nuthatch, 1; Brown Creeper, 1, Brown-headed Cowbird, 1; Cardinal, 1; Purple Finch, 1, Chipping Sparrow, 1; Cooper's Hawk, +; Flicker, +; White-breasted Nuthatch, +; House Wren, +; Red-eyed

Vireo, +; Scarlet Tanager, +. **Total:** 34 species; 107 territorial males ( $645/\text{km}^2$ , 261/100 acres). **Remarks:** Nests found: Blue Jay, 1; Dark-eyed Junco, 1. Two young Barred Owls were seen in mid-June but their nest was not thought to have been in the plot. This year, there was a 50% increase in Magnolia and Black-throated Green Warblers; a 75% increase in Golden-crowned Kinglets; and an 85% increase in Blackburnian Warblers. Total number of species and territorial males reached a 3-year high. Appreciation to Robert Place for weather data. — *ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N. Y. 14803.*

**61. HEMLOCK-BLACK ASH SWAMP.** — **Location:** Pennsylvania; Crawford Co., Rockdale Twp., 3 mi. E of Cambridge Springs between Johnstown Road and State Route 408, on Muddy Creek Research Natural Area, Erie Nat'l Wildlife Refuge;  $41^\circ 47' \text{N}$ ,  $80^\circ 00' \text{W}$ , Millers Station Quadrangle, USGS. The area begins approximately 1000 ft SW of the confluence of Muddy and French Creeks to form a major Allegheny R. tributary. **Continuity:** New. **Size:** 8.1 ha = 20 acres ( $1044 \times 835 \text{ ft}$ ; rectangular and with the north-facing line lying  $12^\circ \text{ W}$  of true N; surveyed with compass and steel tape and divided into 30 two-third acre blocks). **Description of Plot:** The dominant canopy species are Black Ash (*Fraxinus nigra*) and Hemlock (*Tsuga canadensis*). Most prominent in the understory are Spicebush (*Lindera benzoin*) and Witch-Hazel (*Hamamelis virginiana*). Poison Ivy (*Rhus radicans*) vines are rather widespread. The ground cover is primarily Cinnamon Fern (*Osmunda cinnamomea*), Sensitive Fern (*Onoclea sensibilis*), Royal Fern (*Osmunda regalis*), Skunk Cabbage (*Symplocarpus foetidus*) and Jewel Weed (*Impatiens* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six 0.1-acre circular samples, 775/acre; total basal area  $177.0 \text{ ft}^2/\text{acre}$ . Species comprising 90% of the total number of trees: Black Ash, 229, 30, 22, 100; Hemlock, 225, 29, 28, 100; Yellow Birch (*Betula lutea*); 110, 14, 11, 100; Red Maple (*Acer rubrum*), 73, 9, 9, 100; White Pine (*Pinus strobus*), 45, 6, 17, 100; dead trees, 65, 8, 7, 100. Trees by diameter size class: A (3-6 in.) 556, 72, 55.6, 33; B (6-9 in.) 124, 16, 37, 1, 21; C (9-15 in.) 87, 11, 69.5, 39; D (15-21 in.) 8, 1, 15, 8. Shrub stems/acre 7443; ground cover 85% with 5% bare and the other 10% open water. Water also covers 35% of the area with ground cover and is present in all blocks in the area. Canopy cover 86%; average canopy height 49 ft (range 20-95). **Edge:** Bordered on all sides by similar habitat. **Topography:** Essentially flat, but with numerous mounds rising 1-2 ft above water level on which many of the trees grow. The mounds are created by the slow decay of the basal area of previous trees. New tree growth starts on the mounds before they are completely decayed causing many of the trees to eventually have partially elevated root systems. Uprooted trees are scattered throughout. The substrate is very unstable and travel is treacherous. **Elevation:** 1145 ft. **Weather:** Temperature normal but much drier than average. **Coverage:** April 17, 21, 29; May 2, 20; June 8, 10, 12, 15; between 0530 and 0930 or 1900 and 2300. Total man-hours: 49. **Census:** N. Waterthrush, 22 (272, 110); Black-capped Chickadee, 5 (62, 25); Brown Creeper, 4 (49, 20); Winter Wren, 3 (37, 15); Great Crested Flycatcher, 2; Blue Jay,

2; Veery, 2; Red-eyed Vireo, 2; Blackburnian Warbler, 2; Canada Warbler, 2; Hairy Woodpecker, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Com. Grackle, 1, Barred Owl, +; E. Wood Pewee, +; Com. Crow, +, Black-throated Green Warbler, +; Scarlet Tanager, +. **Total:** 19 species; 50 territorial males ( $618/\text{km}^2$ , 250/100 acres). **Visitors:** Yellow-billed Cuckoo, Great Horned Owl, Pileated Woodpecker, Downy Woodpecker, Am Robin, Wood Thrush, Cedar Waxwing, Solitary Vireo, Cardinal, Swamp Sparrow, Song Sparrow. **Remarks:** One N. Waterthrush nest was located. — *DONALD B SNYDER and DAVID STEADMAN, Dept. of Biology, Edinboro State College, Edinboro, Pa. 16444.*

**62. MOUNTAIN TOP, MIXED HARDWOOD AND WHITE PINE FOREST.** — **Location:** Pennsylvania, Westmoreland Co., 10 mi. SSW of Ligonier, 6 mi S of Laughlintown in Forbes State Forest on the top of Laurel Mountain;  $40^\circ 07' 18'' \text{N}$ ,  $79^\circ 10' 47'' \text{W}$ , Bakersville Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 6.07 ha = 15 acres (rectangular, 330 x 1980 ft, measured). **Description of Plot:** See AB 28 1014 (1974). **Weather:** Sunny, some cloud cover, mostly warm and clear. **Coverage:** June 5-7, 9, 12-13. Hours 0500 to 0930, 1200 to 1300, and 1700 to 1930. Total party-hours: 20. **Census:** Red-eyed Vireo, 5 (82, 33), Solitary Vireo, 3.5 (58, 23); Canada Warbler, 3.5; Veery, 3 (49, 20); Black-throated Blue Warbler, 3; Rufous-sided Towhee, 3; Hermit Thrush, 2.5; Black-throated Green Warbler, 2; Dark-eyed Junco, 2; Ovenbird, 1.5; Com. Yellowthroat, 1.5; Scarlet Tanager, 1; E. Wood Pewee, 0.5; Black-capped Chickadee, 0.5; Gray Catbird, 0.5; Wood Thrush, 0.5; Magnolia Warbler, 0.5; Red-shouldered Hawk, +; Hairy Woodpecker, +; Blue Jay, +, Com. Crow, +; Rose-breasted Grosbeak, +; Chipping Sparrow, +. **Total:** 23 species; 34 territorial males ( $560/\text{km}^2$ , 227/100 acres). — *R. CARRELL ABBOTT (compiler), Carnegie Museum, Pittsburgh, Pa. 15213*

**63. COASTAL MIXED PINE — OAK FOREST.** — **Location:** North Carolina; Brunswick Co., in Pinner's Point, Long Beach on Oak Island, 10 m W of Southport,  $33^\circ 55' \text{N}$ ,  $78^\circ 10' \text{W}$ , Lockwoods Folly Quadrangle, USGS. **Continuity:** Established 1973; 4 consecutive years. **Size:** 19.2 ha = 47.5 acres (rectangular, surveyed with hand compass in units of 45.73 x 45.73 m; sectioned into lots for development as part of the city of Long Beach) **Description of Plot:** See AB 27: 978-979 (1973) and 28 1015 (1974). **Weather:** Severe drought in March and April, very wet June with total of 15 in. of rain; followed by a hot and humid July. **Coverage:** April 19, 23, 27, May 10, 13, 19, 25; June 2, 9, 18; July 9; between 0553 and 0858, EST. Total man-hours: 79.2. **Census:** Cardinal, 11 (7, 23); Great Crested Flycatcher, 9 (47, 19); Tufted Titmouse, 8 (42, 17); Red-bellied Woodpecker, 6 (31, 13), Fish Crow, 6; Carolina Wren, 6; Blue Jay, 4 (21, 8), Blue-gray Gnatcatcher, 4; Carolina Chickadee, 3 (16, 6), Pine Warbler, 3; Mourning Dove, 2.5; Com. Flicker, 2.5, Summer Tanager, 2.5; Yellow-billed Cuckoo, 2; Downy Woodpecker, 2; Painted Bunting, 2; Red-headed Woodpecker, 1.5; Bobwhite, 1; Chuck-will's-widow, 1; Pileated Woodpecker, 1; Brown-headed Nuthatch, 1; Brown Thrasher, 1; Com. Grackle, 1; Indigo Bunting, 1. **Total:** 24 species, 82 territorial males or females ( $427/\text{km}^2$ , 173/100 acres). **Remarks:** Cardinals and Great Crested

Flycatchers are again the most abundant breeding species. Total of all species is back to the 1974 level. Cardinals, Great Crested Flycatchers, titmice, Bobwhites, Downy Woodpeckers and gnatcatchers (one feeding a cowbird), were seen with young. Seventeen cottages (2 more than in 1975) and 2 being built are on the area. — *SAMUEL R. and ISABEL H. TIPTON, 113 23rd St., S W, Long Beach, Southport, N.C. 28461.*

#### 64. TAMARACK BOG AND HARDWOOD. —

**Location:** Michigan; Berrien Co., one mi. SW of Stevensville in the Grand Mere State Park, 0.5 mi. N of Willow Drive on Wishart Road; 41°59'30"N, 86°33'W, Bridgman Quadrangle, USGS. **Continuity:** New. **Size:** 8.5 ha = 21 acres (rectangular). **Description of Plot:** See AB 30:1049 (1976). **Coverage:** May 23, 27, 30; June 1, 6, 12-13, 16, 20; between 0600 and 0900. Total man-hours: 13.5. **Weather:** Clear on all trips with fog one morning; temp. and rainfall normal. **Census:** Blue Jay, 3 (35, 14); Veery, 3; Canada Warbler, 3; Great Crested Flycatcher, 2; Cardinal, 2; E. Wood Pewee, 1; Tufted Titmouse, 1; Gray Catbird, 1; Wood Thrush, 1; Com. Yellowthroat, 1; Scarlet Tanager, 1; White-breasted Nuthatch, 0.5; Ovenbird, 0.5; Downy Woodpecker, +; Red-breasted Nuthatch, +; Red-eyed Vireo, +. **Total:** 16 species; 20 territorial males (235/km<sup>2</sup>, 95/100 acres). **Remarks:** Nests located: Wood Thrush, Scarlet Tanager. — *ALBERT MORSE, JAMES MULLINS (compiler), 2558 Locust Lane, Stevensville, Mich. 49127.*

#### 65. MIXED PINE-HARDWOOD FOREST. —

**Location:** Texas; Angelina Co., Angelina College Property, 1.6 mi. S of intersection of Loop 287 and US 59; 31°17'34"N, 94°44'1"W, Lufkin Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 6.31 ha = 15.6 acres (irregular, 862.5 x 787.5 ft, laid out with compass, steel tape, and level). **Description of Plot:** See AB 28: 1016 (1974). **Weather:** Three days had overcast skies but no precipitation; the remaining were clear to partly cloudy. Precipitation above normal, temperatures ranged from 48° to 66°F. **Coverage:** March 31; April 5, 14, 19, 28; May 3, 14, 19, 27-28; between 0700-1000 hours. Total man-hours: 10. **Census:** White-eyed Vireo, 9 (143, 58); Cardinal, 9; Carolina Wren, 6 (95, 38); Hooded Warbler, 3 (48, 19); Red-eyed Vireo, 2; Swainson's Warbler, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; Green Heron, 1; Blue Jay, 1; Tufted Titmouse, 1; Carolina Chickadee, 1; Summer Tanager, 1. **Total:** 13 species; 40 territorial males or females (634/km<sup>2</sup>, 256/100 acres). **Remarks:** Nests located: White-eyed Vireo; a cowbird egg was found with four vireo eggs. Population density increased from 554/km<sup>2</sup>, 224/100 acres in 1975 to 634/km<sup>2</sup>, 256/100 acres. — *CATHI TURNER and LOUIS DEBETAZ (compiler), Science Division, Angelina College, Lufkin, Texas 75901.*

**66. CONIFEROUS FOREST. —** **Location:** Vermont; Lamoille Co., 3.5 mi. N of Wolcott; 44°36'N, 72°26'W, Hardwick Quadrangle, USGS. **Continuity:** New. **Size:** 13.15 ha = 32.5 acres (surveyed by tape and compass and divided into 49 sub-plots; boundaries marked with aluminum plates painted with letters and numbers). **Description of Plot:** Situated on the low lying peatlands

and adjacent north-facing slope drained by Tamarack Brook. In the better-drained upper slope sections the overstory consists of mixed conifers and hardwoods dominated by Balsam Fir (*Abies balsamea*). Red Spruce (*Picea rubens*) is less important here than in the lower portions, and hardwoods, represented mostly by White Birch (*Betula papyrifera*) and Red Maple (*Acer rubrum*), are common, with Black Cherry (*Prunus serotina*) and Yellow Birch (*B. alleghaniensis*) occasionally present. The stand is of mixed ages. The herbaceous understory here is dominated by Wood Sorrel (*Oxalis montana*), Bunchberry (*Cornus canadensis*), and Goldthread (*Coptis groenlandicum*). Balsam Fir reproduction is excellent in some places and in the wetter down-slope section it remains dominant, but Red Spruce becomes more prominent and the hardwoods less so. Only occasionally do White Birch and Red Maple persist into the peat soils of the wet bottomland. Toward the lower areas, woody shrubs become more important in the understory, with Lowbush Blueberry (*Vaccinium angustifolium*), Wild Raisin (*Viburnum cassinoides*) and Mountain Holly (*Nemopanthus mucronata*) becoming common. There are occasional logged over areas with no overstory, but Balsam Fir and Red Spruce seedlings, 2 to 3 m in height are abundant. Progressing toward the wetter soils, Black Spruce (*Picea mariana*) and Tamarack (*Larix laricina*) begin to appear, becoming common near the brook. The peat substrate supports a more bog-like understory consisting, in some places, of a sphagnum ground cover with Creeping Snowberry (*Gaultheria hispida*). Pitcher plants (*Sarracenia purpurea*) are scattered and Labrador-tea (*Ledum groenlandicum*) is abundant in places. At the border of the brook, a community dominated by Speckled Alder (*Alnus rugosa*) and sedges (*Carex* spp.) replaces the coniferous forest vegetation. **Edge:** The N border is Tamarack Brook, with its associated alder-sedge community, beyond which the bottomland Black Spruce-Tamarack forest continues. The S border is a continuation of the mixed conifer-hardwood forest. Along the E and W edges are mixed conifer-hardwoods on the upper slopes, and a Red Spruce-Balsam Fir community in the wetter downslope areas. **Topography:** S edge (at 1250 ft) slopes gently toward the N border (1100 ft). **Weather:** Temperatures ranged from 29° to 70°F. **Coverage:** May 17, 21, 24-25, 28; June 2-3, 5, 7-8, 10, 12, 14, 17, 20, 22-25; 0500-0900 hours, EDT. Total: 57 man-hours. **Census:** Magnolia Warbler, 10 (76, 31); Yellow-rumped Warbler, 8 (61, 25); Cape May Warbler, 7 (53, 22); Ruby-crowned Kinglet, 7; N. Parula, 6 (46, 18); Golden-crowned Kinglet, 5 (38, 15); Blackpoll Warbler, 4 (30, 12); N. Waterthrush, 4; Brown-headed Cowbird, 4; White-throated Sparrow, 4; Red-breasted Nuthatch, 3 (23, 9); Black-throated Green Warbler, 3; Purple Finch, 2.5; Winter Wren, 2; Nashville Warbler, 2; Bay-breasted Warbler, 2; Ovenbird, 2; Ruffed Grouse, 1; Yellow-bellied Sapsucker, 1; Yellow-bellied Flycatcher, 1; Veery, 1; Solitary Vireo, 1; Black-and-white Warbler, 1; Com. Yellowthroat, 1; Canada Warbler, 1. **Total:** 25 species; 79.5 territorial males (604/km<sup>2</sup>, 245/100 acres). **Visitors** (average number per 100 acres): Blue Jay, 3; Pine Siskin, 3; Com Raven, 2; Am. Robin, 2; Broad-winged Hawk, 1; Am Goldfinch, 1. **Remarks:** Nests found: Yellow-bellied Flycatcher, 1; Red-breasted Nuthatch, 1; Winter Wren, 1; N. Parula, 1; Yellow-rumped Warbler, 1; N. Water-

thrush, 1. Grateful acknowledgment is made to Peter Marchand for writing the description and to Mathew Luck for assistance in surveying and censusing. —  
*LARRY N. METCALF, Center for Northern Studies, Wolcott, Vt. 05680.*

**67. SCOTCH PINE PLANTATION.** — **Location:** New York; Chautauqua Co., 0.72 mi. SE of Route 5 and Van Buren Road intersection on Fredonia Airport property, 42°26'20"N, 79°23'24"W, Brocton Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 5.26 ha = 13 acres. **Description of Plot:** See AB 29:1104-1105 (1975). Many of the trees were broken off by a March ice storm. **Coverage:** May 19-21, 27; June 12, 20, 22, 25; 0630-0800 and 2000-2115. Total man-hours: 12. **Census:** Am. Robin, 3 (57, 23); Wood Thrush, 1.5; Am. Redstart, 1.5; Cardinal, 1; Song Sparrow, 1; Great Crested Flycatcher, 0.5; Black-capped Chickadee, 0.5; Gray Catbird, 0.5; Indigo Bunting, 0.5. **Total:** 9 species; 10 territorial males (190/km<sup>2</sup>, 77/100 acres). **Remarks:** Nests located: Am. Robin, 2; Wood Thrush, 1. Paul G. Kalka assisted with the field work. This census was funded as part of a larger study by Niagara Mohawk Power Corporation. —  
*ROY S. SLACK, CATHIE A. BAUMGARTNER, and VINCENT J. LUCID, Terrestrial Environment Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**68. UPLAND SCOTCH PINE PLANTATION.** — **Location:** New York; Allegany Co., 2 mi. WSW of Alfred, bordering on the W side of Lake Road, adjacent to the evergreen plantings on the E side of Foster Lake; 42°7'30"N, 77°45'W, Andover Quadrangle, USGS. **Continuity:** Established 1969; 8 consecutive years. **Size:** Approximately 9.3 ha = 23 acres (roughly rectangular; 1881 ft in length, varying in width from 209 ft at the N end to 627 ft at the S end, measured with tape and compass, and divided into one-acre plots). **Description of Plot:** See AFN 23:743-744 (1969). Last fall, 50 Christmas trees were harvested from a section of Blue Spruce at the south end of the plantation. Increasing growth of shrubs and brambles between the harvested trees is providing significant habitat change. Most of the remaining trees, too tall and/or misshapen to be sold as Christmas trees, are not being used any more as nest sites. However, the stubs of previously harvested trees have now sent up a dense, low second growth which is providing excellent sites for Field, Chipping and late-season Song Sparrow nestings. **Weather:** Alfred Cooperative Weather Station data indicates that temperatures during May and June were generally warmer than the 57-year averages, but that precipitation was near normal. A 1 1/4-inch snowfall occurred in May. **Coverage:** May 5, 12-13, 20, 24; June 1, 8, 12, 17, 22, 27; July 17, 22, 27; 0900-1515, EDT, with one trip at dusk. Total man-hours: 23. **Census:** Song Sparrow, 28 (301, 122); Chipping Sparrow, 21 (226, 91); Com Yellowthroat, 8 (86, 35); Field Sparrow, 7 (75, 30); Cedar Waxwing, 6 (64, 26); Am. Robin, 5 (54, 22); Purple Finch, 5; Brown-headed Cowbird (females), 4 (43, 17); Rufous-sided Towhee, 4; Am. Woodcock, 3 (32, 13); Yellow-rumped Warbler, 3; Black-billed Cuckoo, 2; Tree Swallow, 2; Magnolia Warbler, 2; E. Kingbird, 1; Alder Flycatcher, 1; Brown Thrasher, 1; Cardinal, 1; Vesper Sparrow, 1; Bobolink, +; Red-winged Blackbird, +; Gray Catbird, +; Henslow's Sparrow, +. **Total:** 23 species; 105 territorial males (1128/km<sup>2</sup>, 457/100 acres).

**Remarks:** Nests found: Black-billed Cuckoo, 1; Tree Swallow, 2; Am. Robin, 4; Purple Finch, 2; Chipping Sparrow, 11; Field Sparrow, 1; Song Sparrow, 14. One Song Sparrow nest was parasitized by cowbirds; a pair of Yellow-rumped Warblers was observed feeding a young cowbird. A flock of Red Crossbills was noted on every trip until June 12 but appeared to be enjoying the bumper cone crop rather than breeding in the plantation. A combination of increased open areas between harvested trees with increased shrub and bramble growth, and an invasion of tent caterpillars, contributed to the high number of territorial males and a record high number of species after the record low numbers last year. Cardinal and Magnolia Warbler were new breeding species in the plot. Appreciation to Eddy Foster for permission to conduct the study on his land; to Robert Place for weather data; and to Laura Brooks for assistance in the field. —  
*ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N.Y. 14803.*

**69. RED PINE-WHITE PINE FOREST.** — **Location:** Ontario; Simcoe Co., Wasaga Beach, 44°29'N, 80°01'W, W corner of Lot 10, Concession 16, Sunnidale Township East. Can. D. of N. D. 41 A/8E. **Continuity:** New. **Size:** 8.7 ha = 21.6 acres (820 x 1148 ft. rhombus, surveyed) **Description of Plot:** The dominant tree cover is Red Pine (*Pinus resinosa*) and White Pine (*P. strobus*). Individual White Spruce (*Picea glauca*) and small clusters of Balsam Poplar (*Populus balsamifera*) are present. Most prominent in the understory is sapling White Pine with some sapling Red Oak (*Quercus rubra*). Ground cover consists of Blueberry sp. (*Vaccinium angustifolium*, *V. lamarckii*), Huckleberry (*Gaylussacia baccata*), Spreading Juniper (*Juniperus communis*), Bracken (*Pteridium aquilinum*) and lichens (*Cladonia* sp.). The SW quarter was subjected to a ground fire in 1973 which destroyed the understory layer and reduced ground cover. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on four rhombus plots (11% of study area), 115/acre; total basal area 45.1 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees, Red Pine 63, 55, 83, 100; White Pine 39, 34, 14, 75; dead trees 10, 8, 2, 100. Trees by diameter size class: A (3-6 in.) 43, 37, 6, 100; B (6-9 in.) 44, 38, 20, 100, C (9-15 in.) 29, 25, 25, 50. Shrub stems/acre N/A; ground cover 65% (estimated); canopy cover 30% (estimated), average canopy height estimated at 40 ft (range 15-55) **Edge:** Bordered to the E and W by similar vegetation, to the N vegetation composition changes to clusters of sapling White Pine in "sand prairie" and to the S there are scattered mature White Pine and Red Oak with understory of sapling White Pine. **Topography:** Undulating sand dunes, low in N (averaging 5-ft ridges) increasing in height and abruptness to S. Ridges have a general N-S orientation. **Elevation:** 625 ft in the S to 650 ft in the N **Weather:** Cool damp weather, broken by a few hot dry spells in May and June; damper and cooler than average **Coverage:** May 31; June 3, 5-6, 12, 15, 20, 22; July 2, dawn-1100 or 1700-1900 hours. Total man-hours 38 **Census:** Least Flycatcher, 4.5 (51, 21); Chipping Sparrow, 4.5; House Wren, 4 (46, 19); Brown-headed Cowbird (females), 3 (34, 14); Purple Finch, 2.5; Com Nighthawk, 2; E. Kingbird, 2; Cedar Waxwing, 2; Am Goldfinch, 2; Mourning Dove, 1.5; Gray Catbird, 1.5, N Oriole, 1.5; Rufous-sided Towhee, 1.5; Field Sparrow,

15, Great Crested Flycatcher, 1; Brown Thrasher, 1; Blue-gray Gnatcatcher, 1; White-throated Sparrow, 1; E. Wood Pewee, 0.5; Red-eyed Vireo, 0.5; Blue Jay, +; Am. Robin, +. **Total:** 22 species; 39 territorial males or females ( $446/\text{km}^2$ , 181/100 acres). **Remarks:** Thirteen nests were located: Mourning Dove, E. Kingbird, Least Flycatcher (3), House Wren (3), Blue-gray Gnatcatcher, Cedar Waxwing (2), Purple Finch, Rufous-sided Towhee. This study is part of a multi-year resource inventory conducted in Wasaga Beach Provincial Park. Special thanks to the Ontario Ministry of Natural Resources and the staff at Wasaga Beach Provincial Park who established and supported this project. Thanks in particular to Jim Parker, Bill Combdon, Jim Dales, Robert Wilkie, and Rich Grier. **PETER H. VAN STAM, P.O. Box 431, Elmvale, Ontario, LOL IPO, Canada.**

**70. BLACK SPRUCE-TAMARACK BOG. — Location:** Michigan; Iron Co., SE $\frac{1}{4}$  of NW $\frac{1}{4}$  of Sect. 5, T44N, R37W; 46°15'N, 88°58'W, Beechwood Quadrangle, USGS. **Continuity:** New. **Size:** 5.9 ha = 14.63 acres (rectangular, 850 x 750 ft, flagged as a grid of 272 squares 50 x 50 ft each, measured by tape and compass). **Description of Plot:** The interior two-thirds of the plot is a fairly uniform stand of dense Black Spruce (*Picea mariana*). The periphery is more open, with scattered spruces and Tamaracks (*Larix laricina*) and infrequent patches of willows (*Salix spp.*) and Speckled Alder (*Alnus rugosa*). The NE and SE corners are dry upland, featuring large Black Spruce, E. White Pine (*Pinus strobus*), Balsam Fir (*Abies balsamea*), Quaking Aspen (*Populus tremuloides*), and typical northern hardwoods; less than 10% is upland. Trees, 3-inches diameter and over, based on ten randomly located 0.1-acre square samples, 123/acre; total basal area 9.55 ft<sup>2</sup>/acre; listed in order by number of trees/acre, relative density (%), relative dominance (%), and frequency: Black Spruce, 101, 82, 72, 90, Tamarack, 17, 14, 24, 70; dead Black Spruce, 5, 4, 4, 40. Trees by diameter size class (trees/acre, relative density, basal area in ft<sup>2</sup>/acre, relative dominance: A (3-6 in) 121, 98, 9.1, 95; B (6-9 in.) 2, 2, 0.5, 5; only Tamaracks greater than 6-in. diameter. Smaller trees, less than 3-in. diameter but greater than 6 ft in height, based on ten 0.1-acre square samples (stems/acre): Black Spruce 459, Tamarack 277, dead Black Spruce 37 (most averaged 8-12 ft tall). Shrubs (woody stems less than 6 ft tall), based on ten 0.01-acre strips (stems/acre): Black Spruce 1830, Tamarack 360, willow (*Salix spp.*) 230. Ground cover 100%, composed chiefly of *Sphagnum* and Leatherleaf (*Chamaedaphne calyculata*), with smaller quantities of Labrador-tea (*Ledum groenlandicum*), Bog Rosemary (*Andromeda glaucocephala*), Pale Laurel (*Kalmia polifolia*), Small Cranberry (*Vaccinium oxycoccus*), blueberry (*Vaccinium angustifolium* and *V. myrtillodes*), cottongrass (*Eriophorum spp.*), Larger Blue Flag (*Iris versicolor*), and Three-leaved False Solomon's-seal (*Smilacina trifolia*). **Edge:** Some open bog extends to the N and E, with mixed conifer-hardwood forest on the NE, SE, and to the W. Recently logged aspen-fir upland approaches the NW. A gravel road 50-100 ft south of the plot and essentially parallel to it separates the spruce-tamarack bog from open, wet Leatherleaf "muskeg". **Topography:** Flat, rising slightly on upland corner. **Elevation:** 1650 ft. **Weather:** Cloud cover on five days,

light sprinkling on one, clear otherwise. Temperatures ranged from 44° to 67°F, averaging 55°. Winds were light or negligible. **Coverage:** May 29; June 2, 4-5, 7, 9, 12, 16, 26; July 5; 0530-0700 or 0720-0955. Four to seven observers per count through June 16, one observer thereafter. Total man-hours: 78. **Census:** Nashville Warbler, 10 (169, 68); Song Sparrow, 5 (84, 34); White-throated Sparrow, 4 (68, 27); Lincoln's Sparrow, 3 (51, 21); Cedar Waxwing, 2; Com. Yellowthroat, 1.5; Cape May Warbler, 1; Mallard, 0.5; Com. Snipe, 0.5; Alder Flycatcher, 0.5; Boreal Chickadee, 0.5; Hermit Thrush, 0.5; Golden-crowned Kinglet, 0.5; Ruby-crowned Kinglet, 0.5; Red-eyed Vireo, 0.5; Chestnut-sided Warbler, 0.5; Swamp Sparrow, 0.5; Yellow-rumped Warbler, +; Blackburnian Warbler, +; Ovenbird, +; Red-winged Blackbird +. **Total:** 21 species; 31.5 territorial and non-territorial males ( $532/\text{km}^2$ , 215/100 acres). **Visitors:** Merlin, Am. Robin, Black-and-white Warbler, Golden-winged Warbler, N. Waterthrush, Rose-breasted Grosbeak, Evening Grosbeak, Dark-eyed Junco. **Remarks:** Nests found: Mallard, Com. Snipe, Hermit Thrush, Cedar Waxwing (2), Nashville Warbler, Lincoln's Sparrow, Song Sparrow (3). If counts had terminated prior to June 16, Cedar Waxwings would have been considered visitors. Species represented by one or fewer "territories" reflect edge or upland habitats, except for the Mallard, snipe, and Hermit Thrush which all nested on *Sphagnum* hummocks. Special thanks to L. Hertz and R. M. Anderson for directing student participation on many counts and for assisting with plot layout and vegetation sampling respectively. Census visits were made by members of the Camp Filibert Roth (Univ. of Mich.) field ornithology class: J. Anderson, J. Applebaum, J. Balliet, R. Bayer, H. Blake, R. Braus, T. Casella, V. Dupler, C. Eckstein, D. Herter, J. Hovis, C. Kibler, T. Legeret, W. Oberhue, M. Secret, L. Sollenberger, D. Weiner, W. Wilson. — **W. L. ANDERSON, Camp Filibert, Iron River, Mich. 49935.**

**71. BLACK SPRUCE-TAMARACK BOG II. — Location:** Michigan; Iron Co., NW $\frac{1}{4}$  of SE $\frac{1}{4}$  of Sect 28, T45N, R36W; 46°16'N, 88°49'W, Kenton Quadrangle, USGS. **Continuity:** New. **Size:** 6.22 ha = 15.38 acres (a square 800 x 800 ft with a 100-ft strip running 300 ft N-S along the SE corner; flagged as a grid of 268 squares 50 x 50 ft each, measured by tape and compass). **Description of Plot:** Dense Tamarack (*Larix laricina*) and Black Spruce (*Picea mariana*) in the SE corner, grading to fairly open bog with small Tamaracks to the N and W, with essentially open bog mat from northcentral to NW. The NE corner has dense sedges (*Carex spp.*), Speckled Alder (*Alnus rugosa*), and Bog Birch (*Betula glandulifera*), with more alders and some willows (*Salix spp.*) in the SW and SE corners. Trees, 3-in. diameter and over, based on ten 0.1-acre square samples, 20/acre, total basal area 1.90 ft<sup>2</sup>/acre; listed in order by number of trees/acre, relative density (%), relative dominance (%), and frequency: Black Spruce, 17, 85, 91, 40; Tamarack, 3, 15, 9, 30; all trees less than 6-in. diameter. Smaller trees, less than 3-in. diameter but greater than 6 ft in height, based on ten 0.1-acre square samples (stems/acre): Tamarack 204, Black Spruce 84 (most average 7-8 ft tall). Shrubs (woody stems less than 6 ft tall), based on ten 0.01-acre strips (stems/acre): Black

Spruce 936, Tamarack 296, Speckled Alder 360, Mountain Holly (*Nemopanthus mucronatus*) 20, ground cover 100%, chiefly *Sphagnum* and Leatherleaf (*Chamaedaphne calyculata*), with smaller quantities of Labrador-tea (*Ledum groenlandicum*), Bog Rosemary (*Andromeda glaucophylla*), Pale Laurel (*Kalmia polifolia*), Small Cranberry (*Vaccinium oxycoccus*), blueberry (*Vaccinium* spp.), sedge (*Carex* spp.), and cottongrass (*Eriophorum* spp.). **Edge:** The S side adjoins a wide band of dense alder. The E edge grades into dense alder, Black Spruce, Tamarack, and Balsam Fir (*Abies balsamea*), giving way to upland forest of spruce-fir, aspen (*Populus* spp.), and northern hardwoods. The W and N sides are flanked by a continuation of bog habitat, approximately 25 acres more, much of it open, treeless mat. No open water is nearby. **Topography:** Flat. **Elevation:** 1550 ft. **Weather:** Warm and dry throughout period. Temperatures ranged from 40°-75°F. Cloudy four visits, sprinkled once, otherwise clear. Wind slight or none on all but one morning. **Coverage:** May 17, 29; June 2, 4, 8, 10-12, 17, 24, 28; July 3; between 0530-0715, and 0715-1120, 1930-2030. Total man-hours: 81. **Census:** Song Sparrow, 9.5 (155, 62); Nashville Warbler, 6 (97, 39); Golden-winged Warbler, 4.5 (72, 29); White-throated Sparrow, 3.5 (56, 23); Cedar Waxwing, 3 (48, 20); Com. Yellowthroat, 2; Alder Flycatcher, 1.5; Chestnut-sided Warbler, 1.5; Savannah Sparrow, 1.5; Lincoln's Sparrow, 1.5; Yellow-bellied Flycatcher, 1; Swamp Sparrow, 0.5; Great Crested Flycatcher, +; Boreal Chickadee, +; Golden-crowned Kinglet, +; Ruby-crowned Kinglet, +; Solitary Vireo, +; Black-and-white Warbler, +; Cape May Warbler, +; Yellow-rumped Warbler, +; Purple Finch, +. **Total:** 21 species; 36 territorial and non-territorial males ( $578/\text{km}^2$ , 234/100 acres). **Visitors:** Sharp-shinned Hawk, Marsh Hawk, Am. Kestrel, Com. Snipe, Chimney Swift, Com. Flicker, Downy Woodpecker, Olive-sided Flycatcher, Tree Swallow, Gray Jay, Blue Jay, Red-breasted Nuthatch, Brown Thrasher, Am. Robin, Palm Warbler, Rose-breasted Grosbeak. **Remarks:** Nests found: Cedar Waxwing (4), Com. Yellowthroat, White-throated Sparrow, Song Sparrow (3). This census was a cooperative project of the Univ. of Mich. Camp Filibert Roth. Participants: R. Anderson, A. Benshoff, B. Bourassa, J. Day, M. Faris, C. Hance, J. Kalenak, M. McGoorty, J. Murray, M. Peczynski, W. Reiter, E. Ridderling, D. Ruppert, S. Silberg, E. Skillings, H. Steele, D. Streiff, and B. Wismer. A. Sheck coordinated much of the student participation and, along with M. Yamasaki, attended most counts. — *W. L. ANDERSON, Camp Filibert Roth, Iron River, Mich. 49935.*

**72. SEMI-OPEN BLACK SPRUCE BOG.** — **Location:** Michigan; Gogebic Co., NE $\frac{1}{4}$  of Sect. 6, T44N, R38W, Phelps Quadrangle, USGS. **Continuity:** New. **Size:** 6.71 ha = 16.59 acres (square, 850 x 850 ft, flagged as a grid of 289 squares 50 x 50 ft each, measured by tape and compass). **Description of Plot:** Black Spruce (*Picea mariana*) and to a lesser extent Tamarack (*Larix laricina*) are scattered over most of the plot, with spruce (15-30 ft tall) fairly dense in the SE quarter. Trees, 3-in. diameter and over, based on ten randomly located 0.1-acre square samples, 26/acre; total basal area, 1.17 ft<sup>2</sup>/acre; listed in order by number of trees/acre, relative density (%), rel-

ative dominance (%), and frequency: Black Spruce, 17, 65, 45, 40; dead Black Spruce, 6, 23, 35, 20; Tamarack, 3, 12, 20, 30; all trees less than 6-in. diameter. Smaller trees, less than 3-in. diameter but greater than 6-ft in height, based on ten 0.1-acre square samples (stems/acre): Black Spruce 333, Tamarack 50, dead Black Spruce 22 (most averaged 8-10 ft tall). Shrubs (woody stems less than 6 ft tall), based on ten 0.01-acre strips (stems/acre): Black Spruce 1670, Tamarack 130 A 100-200 ft wide peninsula of tall (30-40 ft) Black Spruce, Tamarack, Quaking Aspen (*Populus tremuloides*), and Balsam Fir (*Abies balsamea*) juts into the N side of the plot for 300 ft. Ground cover 100%, mainly *Sphagnum* mosses, often consolidated into low hummocks having Leatherleaf (*Chamaedaphne calyculata*), Labrador-tea (*Ledum groenlandicum*), Pale Laurel (*Kalmia polifolia*), Bog Rosemary (*Andromeda glaucophylla*), and cottongrass (*Eriophorum* spp.). **Edge:** Bog continues for several hundred feet to the E, S, and SW. The W edge touches spruce-fir forest and the N edge faces northern hardwoods and aspen. **Topography:** Flat. **Elevation:** 1685 ft **Weather:** The sky was overcast twice, partly cloudy once, and clear eight times. Temperatures ranged from 40°-70°F, averaging 55°. Winds were light or negligible. **Coverage:** May 29; June 2-8, 10, 12, 23, 30; July 5, 0530-0900, 1925-1950. Six observers on most counts through June 12. Total man-hours: 54.7. **Census:** Song Sparrow, 4 (60, 24); Nashville Warbler, 2; White-throated Sparrow, 2; Lincoln's Sparrow, 2; Yellow-rumped Warbler, 1.5; Palm Warbler, 1.5; Ruby-crowned Kinglet, 1; Am Robin, 0.5; Hermit Thrush, 0.5; Cedar Waxwing, 0.5, Com. Yellowthroat, 0.5; Yellow-bellied Flycatcher, +; Olive-sided Flycatcher, +; Gray Jay, +; Golden-crowned Kinglet, +; Blackburnian Warbler, +; Purple Finch, +; Dark-eyed Junco, +; Chipping Sparrow, +. **Total:** 19 species; 16 territorial and non-territorial males ( $238/\text{km}^2$ , 96/100 acres). **Visitors:** Chimney Swift, Com Flicker, Great Crested Flycatcher, Tree Swallow, Ovenbird, Brown-headed Cowbird, Savannah Sparrow **Remarks:** Of the marginal species marked by + signs, the Yellow-bellied Flycatcher and Gray Jays are typical of bog habitat; the others were picked up as edge species. Nests found: Hermit Thrush, White-throated Sparrow, Song Sparrow. Census visits were made by members of the Camp Filibert Roth (Univ. of Mich.) field ornithology class: J. Bory, S. Bosak, M. Daniels, V. Denman, D. Drost, G. Eggemeyer, R. Forte, M. Hackel, J. Herbert, R. Kirk, S. Kocis, V. Macer, K. Noble, H. Patterson, S. Richard, C. Smithka, J. Sullivan. Special thanks to Harold Steele for coordinating and assisting with the student participation in the counts and to R. M. Anderson for help in vegetation sampling. — *W. L. ANDERSON, Camp Filibert Roth, Iron River, Mich. 49935.*

**73. MIXED UPLAND HABITAT AND SWAMP.** — **Location:** Connecticut; Fairfield Co., Newtown, intersection of Route 34 and Zoar Road; 41°24'N, 73°14'W, Southbury Quadrangle, USGS. **Continuity:** Established 1968; 9 consecutive years. **Size:** 14.16 ha = 35 acres (irregular, greatest dimensions 653 x 364 yards, surveyed). **Description of Plot:** See AFN 22: 714-715 (1968) **Coverage:** May 20, 22-23, 29-31; June 3-5, 10-11, 13, 17, 24, 26-27; July 1, 3-4; 0450-1230 or 1530-1945, EDT Total man-hours: 38. **Census:** Ovenbird, 17 (120, 49),

Veery, 10 (71, 29); Rufous-sided Towhee, 8.5 (60, 24); Red-eyed Vireo, 8 (56, 23); Wood Thrush, 7.5 (53, 21); Com Flicker, 6 (42, 17); Black-and-white Warbler, 6; Rose-breasted Grosbeak, 6; Scarlet Tanager, 5 (35, 14); Blue Jay, 4 (28, 11); Am. Robin, 4; E. Wood Pewee, 3 (21, 9), Black-capped Chickadee, 3; Tufted Titmouse, 3; White-breasted Nuthatch, 3; Gray Catbird, 3; Blue-winged Warbler, 3; Com. Yellowthroat, 3; N. Oriole, 3; Cardinal, 3; Hairy Woodpecker, 2; Downy Woodpecker, 2, House Wren, 2; Brown-headed Cowbird, 2 (females); Indigo Bunting, 2; Ruffed Grouse, 1; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; E. Bluebird, 1; Starling, 1; Chipping Sparrow, 1; Brown Thrasher, 0.5. **Total:** 34 species, 127.5 territorial males or females ( $900/\text{km}^2$ ,  $364/100 \text{ acres}$ ). **Remarks:** Compared with 1975, there was a net gain of 4 species and a rise of 7 in total individuals. In the span 1973-76, Wood Thrush numbered 13, 8, 14, 7.5; Rufous-sided Towhee, 12, 14, 10, 8.5 Thanks to Charles Hills for observations at dusk. — *LAURA H. MOSELEY, 1083 Hillsboro Beach, Pompano Beach, Fla. 33062.*

**74. OAK-HEMLOCK FOREST, SEMI-OPEN FIELDS AND SHRUBLAND.** — **Location:** Connecticut; New London Co., Bolleswood Natural Area of the Conn. Arboretum of Conn. College, New London, S. of Gallows Lane;  $41^\circ 22' \text{N}$ ,  $72^\circ 7' \text{W}$ , Uncasville Quadrangle, USGS. **Continuity:** Established 1955 (1953); 11 intermittent years. **Size:** Oak-Hemlock Forest: 23.1 ha = 57 acres (planimeter analysis of tracing from aerial photograph); Semi-open fields and shrubland: 6.5 ha = 16.1 acres (planimeter). **Description of Plot:** See AFN 9 429-430 (1955), and AB 26:962-965 (1972); *Oak-Hemlock Forest*: In 1953 this area consisted of eight vegetation cover-types, with the following acreages: Transition Forest (young deciduous forest characterized by Greenbrier [*Smilax spp.*] shrub layer)-24.7 acres (10.0 ha), Oak Forest-11.3 acres (4.6 ha); Hardwoods Forest-5.2 acres (2.1 ha); Oak-Hemlock Forest-6.15 acres (2.5 ha), Hemlock-Hardwoods Forest-6.15 acres (2.5 ha); Red Maple Bog-2.3 acres (0.9 ha); Semi-open Bog-0.7 acres (0.3 ha); and Thicket-0.5 acres (0.2 ha). In 1976, there was no thicket habitat left in this area. The other cover-types were represented by the following acreages: Transition Forest-22.9 acres (9.3 ha); Oak Forest-9.9 acres (4 ha), Hardwoods Forest-3.6 acres (1.5 ha); Oak-Hemlock Forest-11.1 acres (4.5 ha); Hemlock-Hardwoods Forest-6.5 acres (2.6 ha); Red Maple Bog and Semi-open Bog, same as above. The only major change in these cover-type designations was the expansion of the Oak-Hemlock Forest from 6.15 acres to 11.1 acres. Within each of the cover-types, the trend was toward increasing stem basal area of the shade-tolerant trees, especially Hemlock and the oaks, and a decline in the density of the shrub stratum, especially in the Hemlock areas. *Semi-Open Fields and Shrublands*: In 1953, this area consisted of two vegetation cover-types: Open and semi-open fields covered 5.8 acres (2.3 ha), and thickets covered 10.3 acres (4.2 ha). In 1976, these types covered only 2 acres (0.8 ha) each. Transition Forest covered 12.1 acres (4.9 ha). Even within the cover-types that are still designated Semi-open Fields and Thicket, much vegetation development has occurred. There are some 40 ft oaks and Black Cherry (*Prunus serotina*) in the Semi-open Fields; cherry and

Winged Sumac (*Rhus copallina*) form a 25 ft canopy in the Thicket. **Edge:** Bordered on the E by Red Pine plantations, a pond, and deciduous forest; on the W by the backyards of adjacent homes; on the S by a powerline right-of-way and deciduous forest; on the N by Gallows Lane. **Topography:** Varied, including swamps, a ravine, ledges, and exposed rock outcroppings. **Elevation:** 200 ft (average). **Weather:** Mild throughout, with somewhat subnormal rainfall. **Coverage:** May 24-26, 28-29; June 1, 3-4, 8-11, 14, 16, 18, 21-22, 25; most trips 530-1030, some during all hours (0500-2230). Total man-hours: 75 **Census:** *Oak-Hemlock Forest*: Gray Catbird, 10 (43, 18), Veery, 9 (39, 16); House Wren, 8.5 (37, 15); Rufous-sided Towhee, 7 (30, 12); Black-and-white Warbler, 6 (26, 11), Tufted Titmouse, 5 (22, 9); Wood Thrush, 5; Ovenbird, 5; Scarlet Tanager, 5; Great Crested Flycatcher, 4 (17, 7), Red-eyed Vireo, 4; N. Oriole, 4; Blue Jay, 2; Black-capped Chickadee, 2; Com. Yellowthroat, 2; Cardinal, 1.5; Broad-winged Hawk, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Brown Thrasher, 1; Am. Robin, 1; White-eyed Vireo, 1; Blue-winged Warbler, 1; Louisiana Waterthrush, 1; Red-winged Blackbird, 1; Indigo Bunting, 1; Hooded Warbler, 0.5. **Total:** 27 species; 90.5 territorial males ( $392/\text{km}^2$ ,  $159/100 \text{ acres}$ ). **Census:** *Semi-Open Fields and Shrublands*: Gray Catbird, 7 (107, 43), Com. Yellowthroat, 4 (61, 25); Red-eyed Vireo, 3 (46, 19), Blue-winged Warbler, 3; Rufous-sided Towhee, 3, Black-capped Chickadee, 2; House Wren, 2; Veery, 2, White-eyed Vireo, 2; Black-and-white Warbler, 2; Am. Redstart, 2; Chestnut-sided Warbler, 1.5; N. Oriole, 1.5, Cardinal, 1.5; Blue Jay, 1; Wood Thrush, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Hooded Warbler, 0.5; Carolina Wren, +; Starling, +; Yellow Warbler, +; House Sparrow, +. **Total:** 23 species; 41 territorial males ( $629/\text{km}^2$ ,  $255/100 \text{ acres}$ ). **Remarks:** *Oak-Hemlock Forest*: Breeding pairs on this site have averaged 107 during the eleven years of the census. This year's 90.5 pairs were below the average, as were the 104.5 of the last census (1973). A total of 51 species has been recorded breeding during at least one of the 11 censuses; average, 26 species. Fourteen species can be considered to be common-to-abundant, averaging from 2 to 12 pairs. Gray Catbird, Veery, Black-and-white Warbler, Wood Thrush, Blue Jay, and Com. Yellowthroat were all near their 11-year averages. House Wren (8.5 pairs in 1976 versus 4 pairs average), Scarlet Tanager (5 vs. 3), and Great Crested Flycatcher (4 vs. 2) were above average. Rufous-sided Towhee (7 vs. 12), Red-eyed Vireo (4 vs. 11), Ovenbird (5 vs. 9), Black-capped Chickadee (2 vs. 4), and Hooded Warbler (0.5 vs. 6) were below their 11-year averages. The Red-eyed Vireo and Hooded Warbler have shown steady, long-term population declines. The Red-eyed Vireo population dropped from 17 pairs in 1964 to 4 pairs in 1967 and has remained at that low level. The Hooded Warbler has shown a steady decline from a high of 17 pairs in 1959. Nine species have been recorded as breeding only once on this site: only the Indigo Bunting was added in 1976. The Tufted Titmouse and the N. Oriole were remarkable for their high populations in 1976; recorded in 1972: titmouse populations in the 10 previous censuses totaled only six pairs; the oriole was first recorded in 1972. A major difference between this census and those of early years (1953-1964) is a drastic decline in the number and diversity of breeding warblers. The Black-and-white Warbler and the Oven-

bird have remained common; however, the Black-throated Green Warbler, Canada Warbler and Am. Redstart, all formerly common, are now absent. An average of 8.5 warbler species totalling 45 breeding pairs each year was recorded for the first five censuses. Five species averaging 16 breeding pairs a year have been recorded for the last six censuses. *Semi-open fields and shrublands*: This site has averaged 45 pairs of 16 species during the 11 censuses. A total of 42 species has been recorded as breeding on the site. Forty-one breeding pairs in 1976 is quite close to the average up from 29 pairs in 1973. The unusually high total of 23 species this year includes 5 species on only partial territories. Red-eyed Vireo (3 pairs in 1976) has become much more common in the past three censuses as the forest has developed. Rufous-sided Towhee (3 pairs in 1976 vs. 6 average), Chestnut-sided Warbler (1.5 vs. 3.5), and Com. Yellowthroat (4 vs. 6) were all below their average levels. The towhee low was unique for this year; the two warbler lows are most likely a result of vegetation development that is replacing their open thicket habitat with forest. Field Sparrow, Prairie Warbler, and Am. Goldfinch, all formerly common, have disappeared, apparently owing to the vegetation development. Field Sparrow was absent in 1976 for the first time. I thank William Niering and William Barry, co-advisers for the census; the Connecticut Arboretum for financial support; and Joan Zaprzalka and George Hebard. — *GREGORY S. BUTCHER, Box 45, Connecticut College, New London, Conn. 06320.*

**75. UPLAND BRUSHY PASTURE.** — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°42'50"N, 73°13'28"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 10 intermittent years. **Size:** 8.5 ha = 21 acres parallelogram. **Description of Plot:** See AFN 19:609-610 (1965). **Coverage:** May 23; June 5-6, 8-9, 13; 0500-2200. Total man-hours: 25. **Census:** Gray Catbird, 10 (118, 48); Blue-winged Warbler, 7 (82, 33); Rufous-sided Towhee, 7; Com. Yellowthroat, 6 (71, 29); Song Sparrow, 6; Field Sparrow, 5 (59, 24); Am. Woodcock, 4 (47, 19); Cedar Waxwing, 4; Red-eyed Vireo, 3 (35, 14); Am. Redstart, 3; Am. Goldfinch, 3; Blue Jay, 2; Wood Thrush, 2; Nashville Warbler, 2; Chestnut-sided Warbler, 2; Prairie Warbler, 2; Brown-headed Cowbird, 2; Black-capped Chickadee, 1.5; Veery, 1.5; Brown Thrasher, 1; Am. Robin, 1; Cardinal, 1; Indigo Bunting, 1; Ruffed Grouse, 0.5; Black-billed Cuckoo, 0.5; E. Kingbird, 0.5; House Wren, 0.5; Black-and-white Warbler, 0.5; Yellow-billed Cuckoo, +; Yellow-throated Vireo, +; Warbling Vireo, +; Ovenbird, +; N. Oriole, +; Rose-breasted Grosbeak, + **Total:** 34 species; 79.5 territorial males (935/km<sup>2</sup>, 379/100 acres). **Remarks:** Habitat continues to undergo rapid change from open, grazed pasture to hardwood forest. After falling slightly, the overall density rose by 12.5 territorial males over last year. Special thanks to Jim Cavanaugh for his help. — *ANDREW MAGEE, Woollybear, Troy, N. H., 03465.*

**76. SHRUB COMMUNITY I.** — **Location:** New York; Chautauqua Co., Erie Lake Plain, along Van Buren Road 1/5 mi. E of Route 5; 42°26'41"N, 79°24'47"W, Brocton Quadrangle, USGS. **Continuity:**

Established 1975. **Size:** 9.3 ha = 23 acres (L-shaped, planimetered). **Description of Plot:** See AB 29 1113 (1975). **Weather:** Generally warm, rain on one morning. **Coverage:** May 20, 22, 24; June 9, 13, 17, 23, 26, 29, 0630-0930 and 1850-2030. Total man-hours: 15. **Census:** Yellow Warbler, 26 (279, 113); Gray Catbird, 11 (118, 48); Willow Flycatcher, 10 (107, 48); Red-winged Blackbird, 9 (97, 39); Com. Yellowthroat, 7 (75, 30); Song Sparrow, 5 (54, 22); Am. Robin, 2.5; Brown Thrasher, 2; Com. Grackle, 2; Cardinal, 2; Rufous-sided Towhee, 2; Field Sparrow, 2; Wood Thrush, 1; Brown-headed Cowbird, 1; Mourning Dove, 0.5. **Total:** 15 species, 83 territorial males (892/km<sup>2</sup>, 361/100 acres). **Remarks:** Yellow Warbler population has doubled since last year. This census was funded by Niagara Mohawk Power Corporation as part of a larger study. — *CATHIE A BAUMGARTNER and ROY S. SLACK, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**77. SHRUB COMMUNITY II.** — **Location:** New York; Chautauqua Co., Erie Lake Plain, ½ mile N of the East Middle Road RR trestle; 42°32'33"N, 79°12'30"W, Silver Creek Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 8.9 ha = 22 acres (rectangle, planimetered). **Description of Plot:** See AB 29 1113-1114 (1975). **Weather:** Generally warm, rain on one morning. **Coverage:** May 20, 24; June 9, 11, 15, 17, 25, 27, 28; 0615-0930 and 2005-2110. Total man-hours 15. **Census:** Yellow Warbler, 9 (101, 41); Gray Catbird, 6 (67, 27); Rufous-sided Towhee, 5.5 (62, 25); Blue-winged Warbler, 4 (45, 18); Com. Yellowthroat, 4; Song Sparrow, 4; Cardinal, 2.5; Field Sparrow, 2; Brown Thrasher, 1.5; Indigo Bunting, 1.5; Willow Flycatcher, 1; Am. Robin, 1; Red-eyed Vireo, 1; Brown-headed Cowbird, 1; Red-headed Woodpecker, 0.5; Red-winged Blackbird, 0.5. **Total:** 16 species; 45 territorial males (505/km<sup>2</sup>, 205/100 acres). **Remarks:** This census was funded by Niagara Mohawk Power Corporation as part of a larger study. — *VINCENT J. LUCID, PAUL G. KALKA, and ROY S. SLACK (compiler), Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**78. MOUNTAIN TOP BOG WITH MIXED HARDWOOD AND EVERGREEN EDGE.** — **Location:** Pennsylvania; Westmoreland Co., 10 mi. SSW of Ligonier, 6 mi. S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; 40°07'20"N, 79°10'28"W, Bakerville Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 6.07 ha = 15 acres (rectangular, 500 x 1307 ft, with irregular open bog areas surrounded by mature edge, measured and calculated). **Description of Plot:** See AB: 28:1027 (1974). **Weather:** Sunny, some cloud cover, mostly warm and clear. **Coverage:** June 5-7, 9, 12-13; 0500-0930, 1200-1300 and 1700-1930. Total party-hours: 12.5. **Census:** Chipping Sparrow, 4 (66, 27); Rufous-sided Towhee, 3.5 (58, 23); House Wren, 3 (49, 20); Dark-eyed Junco, 3; Field Sparrow, 3; Solitary Vireo, 2.5; Com. Yellowthroat, 2.5, Am. Robin, 1.5; Song Sparrow, 1.5; Hermit Thrush, 1; Veery, 1; Golden-crowned Kinglet, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Blackburnian Warbler, 1; Canada Warbler, 1; Scarlet Tanager, 1; Gray Catbird, 0.5; Barred Owl, +; Com. Flicker, +; Pileated Woodpecker, +; Blue

Jay, +; Com. Crow, +; E. Bluebird, +; Com. Grackle, +; Purple Finch, +; Am. Goldfinch, +. **Total:** 27 species; 33 territorial males ( $544/\text{km}^2$ , 220/100 acres). — *R. CARREL ABBOTT* (compiler), Carnegie Museum, Pittsburgh, Pa. 15213.

**79. OLD FIELD-MEADOW AND PRIMARY DECIDUOUS THICKETS.** — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mi. S of intersection of State Route 228 and Kepple Road on Todd Sanctuary;  $40^\circ 44' \text{N}$ ,  $79^\circ 42' \text{W}$ , Freeport Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 10.1 ha = 25 acres (measured with line and compass). **Description of Plot:** See AB 28:1025-1026 (1974). About three acres of Crab Apples (*Pyrus spp.*) were cleared and some selective cutting of Red Maple (*Acer rubrum*) was undertaken. **Weather:** Generally good with mostly cool sunny mornings and ample rain throughout the period. **Coverage:** May 31; June 1, 3-5, 8-9, 11, 14, 17-18, 22-23, 26, 30; July 4, 8; 0500-0800. Total man-hours: 45. **Census:** Indigo Bunting, 7.5 (74, 30); Rufous-sided Towhee, 7.5; Field Sparrow, 6 (59, 24); Cardinal, 3.5 (35, 14); Black-capped Chickadee, 2; Tufted Titmouse, 2; Gray Catbird, 2; Wood Thrush, 2; Red-eyed Vireo, 2; Com. Yellowthroat, 2; Yellow-breasted Chat, 2; Brown-headed Cowbird, 2 (females); Scarlet Tanager, 2; Am. Goldfinch, 2; Yellow-billed Cuckoo, 1; Screech Owl, 1; Ruby-throated Hummingbird, 1; Brown Thrasher, 1; Cedar Waxwing, 1; Golden-winged Warbler, 1; Vesper Sparrow, 1; Great Crested Flycatcher, +; Kentucky Warbler, +. **Total:** 23 species; 51.5 territorial males or females ( $509/\text{km}^2$ , 206/100 acres). **Visitors:** Ruffed Grouse, Mourning Dove, House Wren, Blue-gray Gnatcatcher, Cerulean Warbler. **Remarks:** Nests located: Field Sparrow, 4; Indigo Bunting, 1; Rufous-sided Towhee, 1; Vesper Sparrow, 1. Indigo Buntings and Rufous-sided Towhees increased from 5 last year to 7.5. Yellow-breasted Chat and Golden-winged Warbler also increased. Clearing of parts of this habitat created more desirable conditions for these species. Special thanks to Chuck Bier for advice and assistance with the field work and Donna Egbert for making the maps. — *JEFF MAUGANS, P.O. Box #4, R.D. #1, Marysville, Pa. 17053.*

**80. BRUSHY HILLSIDE.** — **Location:** West Virginia; Braxton Co., 3 mi. ENE of Sutton;  $38^\circ 40' 42'' \text{N}$ ,  $80^\circ 39' 22'' \text{W}$ , Sutton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Small farm site abandoned approximately 20 years ago (acquired by U.S. Corps of Engineers as flood area adjacent to Sutton flood control reservoir). Old field and overgrown pastureland dominates, while pole-stage hardwoods intrude on sites occupying 25 to 30% of the area. The dominant canopy trees are Aspen (*Populus grandidentata*) and Tulip-tree (*Liriodendron tulipifera*). Most prominent in the understory are Multiflora Rose (*Rosa multiflora*) and Poison Ivy (*Rhus radicans*). The open section contains Smooth Sumac (*Rhus glabra*), hawthorn (*Crataegus sp.*) and blackberries (*Rubus sp.*) among Orchard Grass (*Dactylis glomerata*) and other grasses, vines, and

annuals. Trees 3-inches diameter and over, based on six 0.1-acre samples, 64/acre; total basal area, 33 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees Large-toothed Aspen, 40, 62, 76, 17; Tulip-tree, 8, 13, 4, 50; Apple, 3, 5, 18, 17; Flowering Dogwood (*Cornus florida*), 3, 5, 1, 17; Black Walnut (*Juglans nigra*), 3, 5, 10, 33. Trees by diameter size class: A (3-6 in.) 30, 46, 3, 9; B (6-9 in.) 27, 41, 8, 24; C (9-15 in.) 5, 8, 16, 48; D (15-21 in.) 3, 5, 6, 18. Shrub stems 5633/acre; ground cover 91%; canopy cover 33%; average canopy height 28 ft (range 17-45). **Edge:** Bordered on E (low) side by wooded stream valley of mature hardwoods and thick understory and on the W (high) side by a continuation of the brushy hillside. **Topography:** The long N-S axis is parallel to a creek valley (Lower Flatwoods Run) with small feeder streams crossing the plot near both ends; S end and W side about 50 ft higher than N and E edges respectively. **Elevation:** 1249-1300 ft. **Weather:** Hot and dry. **Coverage:** June 6-10; 8 trips 0530-0730, 6 trips other daylight and dusk hours. Total party-hours: 29. **Census:** Yellow-breasted Chat, 8 (132, 53); White-eyed Vireo, 4 (66, 27); Red-eyed Vireo, 4; Golden-winged Warbler, 4, Prairie Warbler, 4; Com. Yellowthroat, 4; Rufous-sided Towhee, 4; Indigo Bunting, 3 (49, 20); Am. Goldfinch, 3, Field Sparrow, 3; Acadian Flycatcher, 2; Carolina Chickadee, 2; Tufted Titmouse, 1; Wood Thrush, 1, 5, E Phoebe, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1, N Parula, 1; Ruby-throated Hummingbird, 0.5; Downy Woodpecker, 0.5; Hooded Warbler, 0.5; Am. Redstart, 0.5; Scarlet Tanager, 0.5; Cardinal, 0.5; Green Heron, +, Broad-winged Hawk, +; Ruffed Grouse, +; Bobwhite, +, Yellow-billed Cuckoo, +; Screech Owl, +; Com. Flicker, +; Pileated Woodpecker, +; E. Wood Pewee, +; Com. Crow, +; E. Bluebird, +; Cerulean Warbler, +; Red-winged Blackbird, +; Brown-headed Cowbird, +. **Total:** 38 species; 55 territorial males ( $906/\text{km}^2$ , 367/100 acres) — *JOHN T. LINEHAN* (compiler) and Brooks Bird Club; Dept. of Entomology and Applied Ecology, Univ of Delaware, Newark, Del. 19711.

**81. ABANDONED RAILROAD.** — **Location:** Ohio, Wyandot Co., Crawford Township, Carey, 3.5 mile section of the old Findlay Branch of the C.C.C. and St L Railroad, extending NW from Carey at  $40^\circ 56' 54'' \text{N}$ ,  $83^\circ 24' 15'' \text{W}$ ; to Vanlue (Amanda Township, Hancock Co.),  $40^\circ 58' 36'' \text{N}$ ,  $83^\circ 28' 30'' \text{W}$ , Upper Sandusky Quadrangle, USGS. **Continuity:** New. **Size:** 8.58 ha = 21 21 acres (3.5 mi. X 50 ft.). Length determined from USGS map and width of the right-of-way estimated. **Description of Plot:** The track was removed in early summer, the roadbed was only slightly modified, and no damage was recorded for the vegetation until later in the summer. The roadbed and paralleling margins, covered with a varying density of herbs, shrubs, and sprout growth from old cuttings, sometimes elevated, sometimes below adjacent banks. Many plants occur along the abandoned right-of-way. Pioneer invaders, weedy herbs, and prairie remnants characterize the non-woody plants. Dominant woody plants include Cottonwood (*Populus deltoides*), Slippery Elm (*Ulmus rubra*), Chinese Elm, Am. Elm (*U americana*), Apple, Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*), White Ash (*Fraxinus americana*), Silver Maple (*Acer saccharinum*), Boxelder (*A negundo*), Cockspur Thorn (*Crataegus crus-galli*)

Shrubs include Gray Dogwood (*Cornus racemosa*), Elderberry (*Sambucus canadensis*), Buttonbush (*Cephalanthus occidentalis*), Prairie Rose (*Rosa setigera*), Multiflora Rose (*R. multiflora*), Woodbine (*Parthenocissus quinquefolia*), and Grape (*Vitis vulpina*). Common everywhere is Poison Ivy (*Rhus radicans*). Sweet White Clover (*Melilotus alba*) dominates the tract area for distances of 100 ft or more while pure stands of Switch Grass (*Panicum virgatum*) occupy lesser distances. Conspicuous in late summer are species of milkweed and goldenrod along with Teasel (*Dipsacus sylvestris*), *Cirsium*, and Wild Carrot (*Daucus carota*). The track for most of its length is bordered by cropland except for about 0.2 of a mile at the E end where a young swamp forest, developing from a very early pasture, shades the right-of-way from the S side. A narrow sapling border on the N side is in turn paralleled by a limestone covered road which crosses the right-of-way about 0.2 mile to the W. The W end is also paralleled by a macadam road on the N side, for about 0.5 mile, relatively free from bordering trees. The macadam road turns S, but a dirt road continues for approximately another 0.5 mile. Two homes are located on the N side of the track at the point where the access road begins. Animal dens are conspicuous and mammal density is probably a significant factor in bird success. **Weather:** February and March were the warmest in 27 years; no unusual or extended weather patterns prevailed; August was very dry. **Coverage:** Almost daily; about 40 hours of regular coverage plus about twice that amount in irregular short intervals. **Census:** The numbers in the order given are: (1) the number of breeding pairs per 3.5 miles of the right-of-way; (2) pairs per square kilometer; (3) pairs per 100 acres, (4) pairs per linear kilometer; (5) pairs per linear mile Song Sparrow, 12 (140, 57, 2.1, 3.4); Indigo Bunting, 9 (105, 42, 1.6, 2.5); Am. Goldfinch, 6 (70, 28, 1.0, 1.7); Am. Robin, 5 (58, 24, 0.9, 1.4); Gray Catbird, 4 (47, 19, 0.7, 1.1); Cardinal, 4; House Wren, 3 (35, 14, 0.5, 0.9); Com. Yellowthroat, 3; House Sparrow, 3; Red-winged Blackbird, 3; Com. Grackle, 3; Mourning Dove, 2; Starling, 2; Chipping Sparrow, 2; Field Sparrow, 2; and 1 each of Bobwhite, Yellow-billed Cuckoo, Ruby-throated Hummingbird, Com. Flicker, Downy Woodpecker, E. Kingbird, Willow Flycatcher, Blue Jay, Carolina Chickadee, Tufted Titmouse, Carolina Wren, Mockingbird, Brown Thrasher, Wood Thrush, Cedar Waxwing, Red-eyed Vireo, Warbling Vireo, Yellow Warbler, Yellow-breasted Chat, and Brown-headed Cowbird. **Total:** 35 species; 83 pairs (967/km<sup>2</sup>, 392/100 acres, 5.6/km, 3.5/mi.). **Remarks:** The abandonment of railroads makes a rather unique habitat available for wildlife. The dispositions of these rights-of-way are important not only for wildlife but for people also. Already put to use as cycle-ways in a few states and under consideration as trail-ways in a few others, they could become a significant factor in helping to sustain and preserve bird populations. — A. H. CLAUGUS, 228 S. Lake St., Carey, Ohio 43316.

**82. DISTURBED OAK-HICKORY FOREST, PINE STAND, EDGE, AND POND.** — **Location:** Ohio, Licking Co., Eden Township, Camp Falling Rock, 1.2 miles NNE of the intersection of County Road 210 and Rte 79; 40°11'N, 82°18.5'W, Newark Quadrangle, USGS. **Continuity:** Established 1937; 38 intermittent years (formerly

listed under five other titles, with variations). **Size:** 14 1/2 ha = about 35 acres (quadrilateral, compass and tape surveyed). **Description of Plot:** See *Bird Lore* 39:379-380 (1937). **Habitat changes:** Of major importance was the construction of the Harold G. Hayes Memorial Covered Bridge spanning the eastward flowing stream. For its construction an adjacent canopy opening was enlarged to about 75 ft in its longer axis. Graded approaches were added to each end, grass-seeded, and planted with a few dogwoods and native flowers. The approaches were fenced with old split-rail remnants. Windfall accounted for additional habitat changes: (1) dead, veteran, Red Oak (*Q. borealis*), 32 in. dbh, taking with it Flowering Dogwoods (*Cornus florida*) of 6, 4, and 3 in., a 4 in. Red Maple (*Acer rubrum*), and the top of a 10 in. Mockernut Hickory (*Carya tomentosa*); (2) second and third dead falls removed three dogwoods, av. dbh, 3 in., a 3 in. Witch Hazel (*Hamamelis virginiana*), a 3 in. Red Maple, and a 5 in. Slippery Elm (*Ulmus rubra*); (3) a live 26 in. Mockernut Hickory slightly reduced the sub-canopy. The past history of these windfalls has been tabulated and is a factor in keeping the forest canopy open or thin. **Weather:** February and March were the warmest in 27 years, otherwise, it was not noteworthy, except for periods of high winds and heavy annual showers. **Coverage:** March 26; April 16, 25; May 13, 28; June 5, 7, July 9; Aug. 17. Total man-hours: 40. **Census:** Wood Thrush, 8 (56, 23); Red-eyed Vireo, 8; Acadian Flycatcher, 6 (42 17); Scarlet Tanager, 5 (35, 14); E. Wood Pewee, 4 (28, 11); Gray Catbird, 4; Am. Robin, 4; Cerulean Warbler, 4; Cardinal, 4; Kentucky Warbler, 3 (21, 9); Mourning Dove, 2; Ruby-throated Hummingbird, 2; Great Crested Flycatcher, 2; E. Phoebe, 2; Carolina Wren, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Indigo Bunting, 2; Chipping Sparrow, 2; Yellow-billed Cuckoo, 1; Screech Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Red-bellied Woodpecker, 1; Chimney Swift, 1; Blue Jay, 1; Com. Crow, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1; Warbling Vireo, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Am. Goldfinch, 1; Rose-breasted Grosbeak, 1; Song Sparrow, 1. **Total:** 39 species; 91 territorial males or females (642/km<sup>2</sup>, 260/100 acres). **Remarks:** Thirty-nine species is a new high; 38 being attained in 1947, 1948, 1973 and 1974. The long-term breeding spectrum of 63 species seems to this writer to be one of the rewards of census efforts, and he ventures to suggest it as one of the goals for environmental management, except in those specific areas where restricted diversity of habitat, monoculture, or preservation of virgin conditions may be more desirable. Next year will be the 50th in which the writer will observe in this census tract. The E. Wood Pewee and Cerulean Warbler continued to be fewer in numbers. The three dominant species, Acadian Flycatcher, Wood Thrush, and Red-eyed Vireo, all were low in total number of individuals as was also the robin. Cowbird activity was very low with no observed eggs, or young being fed. — A. H. CLAUGUS, 228 S. Lake St., Carey, Ohio, 43316.

**83. MIXED HABITAT.** — **Location:** Ohio; Montgomery Co., Aullwood Audubon Center; 1 mi. NE of Englewood, Ohio; 40°17'N; 84°95'W, Trotwood Quadrangle, USGS. **Continuity:** Established 1957; censused

annually, but not previously published. **Size:** 28.3 ha = 70 acres (roughly rectangular). Measurements probably determined by surveying 1957). **Description of Plot:** The dominant canopy trees are Am. Beech (*Fagus grandifolia*), Pignut Hickory (*Carya glabra*), White Basswood (*Tilia heterophylla*), Tulip-tree (*Liriodendron tulipifera*), Black Oak (*Quercus velutina*), Chinquapin Oak (*Q. muehlenbergii*), Sycamore (*Platanus occidentalis*), Burr Oak (*Q. macrocarpa*), and many dead trees. A quantitative survey of the vegetation shows: Trees 3-inches in diameter and over are 116/acre; total basal area 68.51 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees (trees followed by number per acre, density (%), dominance, and frequency): Red Mulberry (*Morus rubra*), 2, 3, 3, 60; dead trees (all kinds), 8, 6, 5, 100, Sycamore, 12, 10, 4, 80; Red Cedar (*Juniperus virginiana*), 8, 6, 3, 60; Black Willow (*Salix nigra*), 2, 3, 3, 20, E. Hop Hornbeam (*Ostrya virginiana*), 6, 5, 1, 20; Am. Hornbeam (*Carpinus caroliniana*), 4, 3, 1, 20; Tulip-tree, 4, 3, 2, 40; Black Ash (*Fraxinus nigra*), 4, 3, 1, 20, White Basswood, 2, 3, 2, 40; Pignut Hickory, 8, 6, 1, 20, Hackberry (*Celtis occidentalis*), 2, 3, 2, 40; Burr Oak, 2, 3, 2, 40; Chinquapin Oak, 4, 3, 2, 40; Ohio Buckeye (*Aesculus glabra*), 6, 5, 2, 40; White Ash (*F. americana*), 6, 5, 2, 40; Black Oak, 8, 6, 1, 20; Red Maple (*Acer rubrum*), 4, 3, 3, 60; Black Walnut (*Juglans nigra*), 24, 21, 4, 80; the understory is mostly Am. Hornbeam, 40%; E Redbud (*Cercis canadensis*), 25%; Pawpaw (*Asimina triloba*), 20%; Tulip-tree, 15%. There is a hardwoods; a second-growth 100% canopy cover forest; an open brushy hill, an open meadow; mixed pine-woods forest near road; a tallgrass prairie; a marsh with standing water; a tall canopy woods with standing water; a planted pine forest; a freshwater pond; and a very open and long rolling high meadow. In the hardwoods the principle undergrowth is White Snakeroot (*Eupatorium rugosum*) and May-apple (*Podophyllum peltatum*). The undergrowth in the second-growth forest is practically the same. On the brushy hill the principle growth is Poison Ivy (*Rhus radicans*) and other typical plants of open fields. The two meadows are similar in growth with Milkweed (*Asclepias syriaca*) being one of the most vigorous. There is a very mixed undergrowth in the mixed pine-woods forest, pond, and marsh. At the marsh in standing water is Cattail (*Typha latifolia*). In the tallgrass prairie Coneflower (*Rudbeckia laciniata*), Bluestem (*Andropogon scoparius*) and Purple Coneflower (*Echinacea angustifolia*) are dominant. In the wet woods the dominant ground cover is primarily Skunk Cabbage (*Symplocarpus foetidus*), Stinging Nettle (*Urtica dioica*), Wing-stem (*Actinomeris alternifolia*), White Snakeroot (*Eupatorium rugosum*), and False Solomon's Seal (*Smilacina racemosa*). Trees by diameter size class followed by number per acre, density (%), basal area, and dominance. A (3-6 in.) 28, 25, 2.8, 2; B (6-9 in.) 38, 34, 6.4, 8; C (9-15 in.) 22, 18, 17.6, 13; D (15-21 in.) 12, 10, 21.6, 16; E (21-27 in.) 2, 1, 6.2, 4; F (27-33 in.) 4, 6, 49.0, 35; G (33-40 in.) 2, 3, 28.4, 21; H (greater than 40 in.) 2, 3, .02, 1, some trees greater than 40 in. included a 53 in. tree and a 48 in. tree. Woody stems are estimated at 68,000/acre; ground cover, 68%; canopy cover, 58% average canopy height, 42 ft (range 15-75 ft). Also, a stream and several buildings are included. **Edge:** Bordered on all sides by similar forest and terrain. A gentle downward slope from the North Woods to the pond.

**Elevation:** 892.5 ft. **Weather:** Good throughout period Average temperature 72°F. **Coverage:** May 8, 22, June 14; July 1, 7, 23; August 13, 21; between 0700 and 1000 Total man-hours: 27. **Census:** Cardinal, 12 (42, 17); Field Sparrow, 9 (32, 13); Am. Robin, 7 (25, 10); Song Sparrow, 7; Am. Goldfinch, 6 (21, 9); Carolina Wren, 5 (18, 7); Com. Grackle, 5; Am. Woodcock, 4 (14, 6); Mourning Dove, 4; Blue Jay 4; Wood Thrush, 4; Red-eyed Vireo, 4, Red-winged Blackbird, 4; Indigo Bunting, 4; Carolina Chickadee, 3 (11, 4); House Wren, 3; House Sparrow, 3, Brown-headed Cowbird, 3; Rufous-sided Towhee, 3, Bobwhite, 2; Yellow-billed Cuckoo, 2; Com. Flicker, 2, Downy Woodpecker, 2; Tufted Titmouse, 2; Gray Catbird, 2; Starling, 2; Com. Yellowthroat, 2; N. Oriole, 2, Screech Owl, 1; Chimney Swift, 1; Ruby-throated Hummingbird, 1; E. Wood Pewee, 1; Mockingbird, 1, E Bluebird, 1; Cedar Waxwing, 1; Yellow Warbler, 1, Ovenbird, 1; E. Meadowlark, 1; Belted Kingfisher, +, Red-bellied Woodpecker, +; Red-headed Woodpecker, +; Great Crested Flycatcher, +; Acadian Flycatcher, +, Purple Martin, +; White-breasted Nuthatch, +; Brown Thrasher, +; Yellow-throated Vireo, +; Blue-winged Warbler, +; Yellow-breasted Chat, +; Kentucky Warbler, +. **Total:** 50 species; 122 territorial males or females (431/km<sup>2</sup>, 174/100 acres). **Remarks:** Nests found: Cedar Waxwing, 1; wren, 1; Am. Goldfinch, 1; Starling, 1, Special thanks to Paul Knoop and Scott Cope for help with this census. — *CLIFF CATHERS*, 24 Grecian Ave., Trotwood, Ohio 45426.

**84. OLD FIELD WITH BRUSH PATCHES.** — **Location:** Indiana; Jefferson Co., Clifty Falls State Park, NW corner of plot 38°45'11"N, 85°24'52"W, in Sect. 33, T4N, R10E, Clifty Falls Quadrangle, USGS. **Continuity:** New **Size:** 17.04 ha = 42.1 acres (irregular rectangle, measured with steel tape and compass). **Description of Plot:** See AB 30:1056-57 (1976); the following plant data from June and July are supplemental. A line census of all woody plants having leaves between 0.5 and 8 ft from the ground measured eleven 100 ft, evenly distributed samples. There was 430 ft of coverage when species coverages were added, but, because of double coverage in many cases, woody plant coverage versus "only herbaceous" was 340 ft to 760 of the 1100 ft counted. Coverage — 48% Honeysuckle (*Lonicera japonica*), 20% blackberry (*Rubus* sp.), 4% Honey Locust (*Gleditsia triacanthos*), 3% each of Spice Bush (*Lindera benzoin*), grape (*Vitis* sp.), Multiflora Rose (*Rosa multiflora*), Am. Elm (*Ulmus americana*), 2% each of Trumpet Vine (*Campsis radicans*), ash (*Fraxinus* sp.), Poison Ivy (*Rhus radicans*), Osage Orange (*Maclura pomifera*), and 1% or less each of 12 other shrubs. **Weather:** Winds Beaufort 0-3, temperatures 36-73°F. April was unusually warm and dry, but May and June were average. **Coverage:** April 23, May 3, 8, 29-31; June 2, 8-10; July 12-13. Total man-hours: 33. **Census:** Field Sparrow, 26 (153, 62); Com Yellowthroat, 15 (88, 36); Song Sparrow, 11.5 (67, 27); Indigo Bunting, 10 (59, 24); Am. Goldfinch, 7 (41, 17), Red-winged Blackbird, 6 (35, 14); Yellow-breasted Chat, 5.5 (32, 13); Henslow's Sparrow, 5 (29, 12); Grasshopper Sparrow, 4 (23, 10); Gray Catbird, 3.5 (21, 8); White-eyed Vireo, 3.5; Bobwhite, 3 (18, 7); Mourning Dove, 2.5, Yellow Warbler, 2.5; Prairie Warbler, 2.5; Cardinal, 2.5, Brown Thrasher, 2; Brown-headed Cowbird, 2 (females),

Carolina Wren, 1.5; E. Meadowlark, 1.5; Am. Woodcock, 1; Com. Flicker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Willow Flycatcher, 1; Carolina Chickadee, 1; House Wren, 1; Am. Robin, 1; E. Bluebird, 1; Starling, 1, N Oriole, 1; Summer Tanager, 1; Black-billed Cuckoo, 0.5; Yellow-throated Warbler, 0.5; Barn Owl, +, Downy Woodpecker, +; Great Crested Flycatcher, +; Kentucky Warbler, +; Rufous-sided Towhee, +. **Total:** 39 species; 130 territorial males ( $763/\text{km}^2$ , 309/100 acres). **Remarks:** The considerable species number and density doubtless relate to the patchy nature of the habitat and extensive edges at this stage of oldfield succession. Juanita R. Webster and several students helped with the census work, but their time was not calculated above. — *J. DAN WEBSTER, Hanover College, Hanover, Ind. 47243.*

**85. DECIDUOUS CLEARCUT.** — **Location:** Tennessee; Washington Co., Horse Cove Gap; about 4.5 mi S of Johnson City;  $36^\circ 14' \text{N}$ ,  $82^\circ 22' \text{W}$ , Erwin Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 20.23 ha = 50 acres (irregular, acreage determined by dot grid). **Description of Plot:** See AB 29:1117-8 (1975). **Weather:** A very dry spring. **Coverage:** May 28, 30-31; June 1-2, 4-5, between 0600 and 0745. Total man-hours: 7. **Census:** Indigo Bunting, 9 (44, 18); Rufous-sided Towhee, 7 (35, 14), Carolina Wren, 4 (20, 8); Yellow-breasted Chat, 4; Kentucky Warbler, 2; Ruby-throated Hummingbird, 1; E Wood Pewee, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Cardinal, 1; Song Sparrow, 1; Downy Woodpecker, +; White-eyed Vireo, +; Hooded Warbler, +. **Total:** 14 species; 32 territorial males ( $158/\text{km}^2$ , 64/100 acres). **Remarks:** No significant change was noted in the vegetation. New territorial species were the Downy Woodpecker, White-eyed Vireo, and Song Sparrow. — *RICHARD LEWIS, Rte. 3, Box 683B, Erwin, Tenn. 37650*

**86. ROADSIDE: DREDGED MATERIAL DISPOSAL SITE.** — **Location:** Louisiana; St. Martin Parish, Atchafalaya Basin; along LA 975 and two access roads, 2.1 mi. N of I-10;  $30^\circ 23' \text{N}$ ,  $91^\circ 39' \text{W}$ , Maringouin Quadrangle, USGS. **Continuity:** New (1975). **Size:** 7.24 ha = 17.9 acres (transect line, oriented along road centerlines, 5200 x 150 ft, paced). **Description of Plot:** Vegetation sampled in July 1974 using a random quadrat method for shrubs and herbaceous plants and the Bitterlich method for trees. Essentially a forest edge situation. An herbaceous association dominated by S. Ragweed (*Ambrosia bidentata*) and White Clover (*Trifolium repens*) comprises 45% (8.2 acres) of the plot, borders one access road and generally the first 25 ft to either side of LA 975. Other prominent herbs are Com. Ragweed (*A. artemisiifolia*), Goldenrod (*Solidago altissima*), and *Verbena brasiliensis*. Percent cover by each is: S. Ragweed, 80; White Clover, 76.7; Com. Ragweed, 10; Goldenrod, 6.7; Verbena, 3.3. Floodplain forest, dominated by Black Willow (*Salix nigra*) and Sycamore (*Platanus occidentalis*), or Black Willow and Cottonwood (*Populus deltoides*) comprises 54% (9.7 acres). This community borders the other access road and the S. Ragweed-White Clover habitat along LA 975 (except for a 500 ft strip along the E side of LA 975 which was cleared in the early 1960s for oil exploration; the area is now occupied by S. Ragweed-White Clover). See

Census 51 for a description of the woodlands. The census area was used as a dredged material disposal site in 1935 and 1936 during construction of the Whiskey Bay Pilot Channel. A very minor disposal also took place in 1962 when the channel was subject to maintenance dredging. LA 975 was constructed in 1969-1970. Vegetation along LA 975 is routinely sprayed to maintain a road and powerline right of way. **Edge:** A 1.6 acre pond is located just beyond the plot boundary in the area cleared for oil exploration. Floodplain forest borders the rest. **Topography:** Gently rolling from N to S. **Elevation:** Varying from 25 ft to 45 ft. **Weather:** Thunderstorms, accompanied by high winds, struck the area on the first night of the census, causing numerous trees to break and fall and probably some mortality to clutches. Overcast conditions occurred on 5 census days with light, intermittent rain falling on 2 days. Clear conditions prevailed on all other days. Morning temperatures were in the upper 60s and low 70s F. Winds were calm except on one day when gusts reached 30 mph. **Coverage:** May 7-14; 0600-0830. Total man-hours: 15.5. **Census (1975):** Yellow-breasted Chat, 15.5 (214, 87); Indigo Bunting, 10 (138, 56); White-eyed Vireo, 9.5 (131, 53); Painted Bunting, 6.5 (90, 36); Cardinal, 3.5 (48, 20); Ruby-throated Hummingbird (females), 3 (41, 17); Com. Yellowthroat, 3, Prothonotary Warbler, 2.5; Hooded Warbler, 2.5; Carolina Wren, 2; Red-eyed Vireo, 2; Brown-headed Cowbird (females), 2; Orchard Oriole, 2; Rufous-sided Towhee, 1.5; N. Parula, 1; Red-bellied Woodpecker, 0.5, Red-shouldered Hawk, +; Com. Flicker, +; Downy Woodpecker, +; Wood Thrush, +; Kentucky Warbler, +; Summer Tanager, +; Red-winged Blackbird, +. **Total:** 23 species, 67 territorial males or females ( $925/\text{km}^2$ , 374/100 acres). **Remarks:** This census was performed to gather baseline data for description of plant and animal succession patterns on U. S. Army, Corps of Engineers (COE) dredged material disposal sites, and was supported by the COE, Waterways Experiment Station, Vicksburg, MS under grant number DACW 39-74-C-0092. — *STEPHEN B. ATKINS, RONALD G. PSCION, DAVID M. DuMOND, and STEVEN W. LEONARD, Coastal Zone Resources Corp., Wilmington, N.C. 28401.*

**87. KENTUCKY BLUE GRASS PRAIRIE.** — **Location:** North Dakota; Stutsman Co., NE quarter of Sect 12, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 4.84 ha = 12 acres (rectangular, 201 x 241 m, paced). **Description of Plot:** See AB 26:972 (1972). Following a prescribed burn in fall 1972, the vegetation has continued to grow and the ground litter accumulate. The plot remains nearly devoid of shrubby vegetation. **Weather:** Precipitation totaled only 0.72 in. in May and 2.67 in. in June. Temperatures in May were slightly above normal, with an average high of  $69^\circ$  and an average low of  $41^\circ \text{F}$ . June was warmer than normal, with average extremes of  $80^\circ$  and  $54^\circ$ . All censuses were made in periods of low winds. Many pond basins were dry at the beginning of the census period; others dried up during the warm weather in June. **Coverage:** May 26; June 7, 8, 16, 18, 23; 10 trips, 0805-1050 hours, CDT. Total man-hours: 3. **Census:** Red-winged Blackbird, 1, Bobolink, 1; W. Meadowlark, 1; Brown-headed Cow-

bird, (female) 1; Savannah Sparrow, 0.5; Am. Bittern, +; Sora, +. **Total:** 7 species; 5 territorial males or females ( $103/\text{km}^2$ , 42/100 acres). **Visitors:** Gadwall, Am. Coot, Com Nighthawk, E. Kingbird, Barn Swallow, Yellow-headed Blackbird, Com. Grackle, Grasshopper Sparrow. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**88. MIXED PRAIRIE (I).** — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 11, T142N, R68W, 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 10 ha = 24.7 acres (square, 316 m, paced). **Description of Plot:** See AB 26:972 (1972). **Weather:** See Census 87. **Coverage:** June 7, 9-10, 16, 18, 23; 8 trips between 0645 and 1135 hours, CDT. Total man-hours: 7.6. **Census:** Clay-colored Sparrow, 7.5 (75, 30); Red-winged Blackbird, 5.5 (55, 22); Blue-winged Teal, 4 (40, 16), Com. Yellowthroat, 4; Brown-headed Cowbird (females), 2; E. Kingbird, 1.5; Bobolink, 1.5; W. Meadowlark, 1.5; Grasshopper Sparrow, 1.5; N. Shoveler, 1; Willow Flycatcher, 1; Yellow Warbler, 1; Gadwall, 0.5; Killdeer, 0.5; Com. Snipe, 0.5; Savannah Sparrow, 0.5; Song Sparrow, 0.5; Am. Bittern, +; Mallard, +; Green-winged Teal, +; Am. Coot, +; Willet, +; Black Tern, +. **Total:** 23 species; 34.5 territorial males or females ( $345/\text{km}^2$ , 140/100 acres). **Visitors:** Pintail, W. Kingbird, Barn Swallow, Gray Catbird, Yellow-headed Blackbird, Com. Grackle, Am. Goldfinch. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**89. MIXED PRAIRIE (II).** — **Location:** North Dakota, Stutsman Co., SW quarter of Sect. 1, T142N, R68W, 47°8'N, 99°15'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 270 yds, surveyed). **Description of Plot:** See AB 26:972-973 (1972). Initially burned in fall 1971, and again on May 6, 1976. The vegetation, nearly all herbaceous, was of low stature, and litter was nearly absent. **Weather:** See Census 87. **Coverage:** May 26, June 7, 9-10, 16, 18, 23; 11 trips between 0800 and 1215 hours, CDT. Total man-hours: 4.3. **Census:** Red-winged Blackbird, 3.5 (57, 23); Blue-winged Teal, 1.5; Mallard, 1; Gadwall, 1; Killdeer, 1; W. Meadowlark, 1; Brown-headed Cowbird (female), 0.5; Upland Sandpiper, +; E. Kingbird, +; W. Kingbird, +. **Total:** 10 species, 9.5 territorial males or females ( $156/\text{km}^2$ , 63/100 acres). **Visitors:** Red-tailed Hawk, Willet, Barn Swallow, Com. Yellowthroat, Yellow-headed Blackbird, Com. Grackle, Am. Goldfinch, Savannah Sparrow. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**90. MIXED PRAIRIE (III).** — **Location:** North Dakota, Stutsman Co., NW quarter of SW quarter of Sect 6, T142N, R67W; 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 270 yds, paced). **Description of Plot:** See AB 26:973 (1972). This plot, burned in fall 1970 and May 1975, has since regrown, although shrubby vegetation is still reduced and litter cover is slight. **Weather:** See Census 87. **Coverage:** May 26; June 7, 9-10, 16, 18; 23; 11 trips between 0605 and 1125 hours, CDT. Total man-hours:

5.5. **Census:** Grasshopper Sparrow, 2.5; W. Meadowlark, 1.5; Bobolink, 1; Red-winged Blackbird, 1; Clay-colored Sparrow, 1; Brown-headed Cowbird (female), 0.5; Savannah Sparrow, 0.5; E. Kingbird, +. **Total:** 8 species; 8 territorial males or females ( $131/\text{km}^2$ , 53/100 acres). **Visitors:** Blue-winged Teal, Com. Nighthawk, Barn Swallow, Cliff Swallow, Yellow-headed Blackbird, Am. Goldfinch. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**91. MIXED PRAIRIE (IV).** — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 11, T142N, R68W; 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 270 yds, paced). **Description of Plot:** See AB 26:973-974 (1972). This plot was burned in spring 1970, fall 1972, and on May 17, 1976. Because of dry weather thereafter, very little growth of vegetation took place prior to the census period. **Weather:** See Census 87. **Coverage:** June 7, 9-10, 16, 18, 23; 8 trips between 0810 and 1130 hours, CDT. Total man-hours: 3.5. **Census:** Red-winged Blackbird, 2, Killdeer, 0.5; Brown-headed Cowbird (female), 0.5; Upland Sandpiper, +; Clay-colored Sparrow, +. **Total:** 5 species; 3 territorial males or females ( $49/\text{km}^2$ , 20/100 acres). **Visitors:** Blue-winged Teal, Black Tern, Barn Swallow, Cliff Swallow, Com. Yellowthroat, Yellow-headed Blackbird, Am. Goldfinch, Clay-colored Sparrow. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**92. MIXED PRAIRIE (V).** — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 12, T142N, R68W; 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 270 yds, paced). **Description of Plot:** See AB 26:974 (1972). After a series of prescribed burns and two seasons of intensive sheep-grazing, most woody vegetation has been killed, although dead trunks and branches remain. The plot was burned again on May 7, 1976. **Weather:** See Census 87. **Coverage:** June 9-10, 16, 18, 23; 8 trips between 0845 and 1115 hours, CDT. Total man-hours: 2.6. **Census:** E. Kingbird, 1; W. Meadowlark, 1; Bobolink, 0.5; Upland Sandpiper, +; Willet, +; Red-winged Blackbird, +; Brown-headed Cowbird (female), +; Grasshopper Sparrow, +. **Total:** 8 species; 2.5 territorial males or females ( $41/\text{km}^2$ , 17/100 acres). **Visitors:** Blue-winged Teal, W. Kingbird, Com. Grackle, Chestnut-collared Longspur. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**93. DISTURBED MIXED PRAIRIE.** — **Location:** Illinois; Grundy Co., Goose Lake Prairie State Park, near Morris; bordered on the W by the Elgin, Joliet and Eastern Railroad, on the N by Collins Road and on the S and E by similar prairie; 41°23'N, 88°18'W, Monooka Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 16 ha = 39.5 acres (trapezoidal, nearly square, 400 x 401 m). Western half of block 1 taken from the park Master Plan. **Description of Plot:** See AB 29:1121-1122 (1975). **Weather:** Predominantly warm and clear, temperatures ranging from 50° in May to 98°F in July. **Coverage:** May 21-22; June 5-6, 26-27; July 3-4, 16, 0500-1300 and after

1600. Total man-hours: 65. **Census:** Red-winged Blackbird, 13 (81, 33); Am. Robin, 4 (25, 10); Bell's Vireo, 4; Eur. Tree Sparrow, 3 (19, 8); Gray Catbird, 3; Am Goldfinch, 3; Bobwhite, 2; Yellow Warbler, 2; Com. Yellowthroat, 2; E. Meadowlark, 2; Indigo Bunting, 2; Rufous-sided Towhee, 2; Pied-billed Grebe, 1; Mallard, 1, Blue-winged Teal, 1; Ring-necked Pheasant, 1; Killdeer, 1; Am. Woodcock, 1; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Great Crested Flycatcher, 1; Traill's Flycatcher, 1; Black-capped Chickadee, 1; Long-billed Marsh Wren, 1; Brown Thrasher, 1; Cedar Waxwing, 1; Com. Grackle, 1; Cardinal, 1; Field Sparrow, 1; Sparrow Hawk, 1; Screech Owl, 1. **Total:** 31 species; total territories: 61 (382/km<sup>2</sup>, 154/100 acres). **Remarks:** Omitted from the description of plot last year: 1 (3 in.) Cedar, *Juniper virginiana*, 1 (3 in.) Osage Orange, (*Maclura pomifera*), and a thicket of Blackberries, (*Rubus* sp.). 50 m in diameter. A large cooling lake covering 19,000 acres has been built 1 mile W of the plot and has been filling slowly since spring, providing ideal habitat for Red-winged Blackbirds and possibly contributing to the lower census count. Thanks to J. and D. Nyhoff, B. and J. Twett for their support and assistance. — JANICE LINKLETTER, 2211 W. Carmen Ave., Chicago, Ill. 60625.

### Breeding Bird Populations of Selected Grasslands and Weedy Fields in North-Central Colorado

The following 15 censuses are on various grasslands and weedy fields on Rocky Mountain Arsenal, an Army installation located in western Adams County, Colorado. The Arsenal, 10 mi. NE of the center of Denver and approximately 20 mi. W of the western foothills of the Rocky Mountain Front Range, is 26.5 square miles in size and is bounded by agricultural and grazing lands on the N and E; a residential area on the W; and Stapleton International Airport, a housing development, an industrial area, and agricultural lands on the S. The study was conducted to collect baseline data necessary for the preparation of environmental impact assessments concerning the restoration of contaminated waste basins and other contaminated areas on the Arsenal and for the purpose of monitoring the effects and measuring the efficiency of these clean-up operations.

Weather data are from Stapleton International Airport, less than 3 mi. S of the Arsenal. In general, spring and early summer temperatures were slightly higher than normal; and total precipitation was considerably less than normal. Average maximum and minimum temperatures were 62.9° and 35.4°F for April, 70.3° and 43.0° for May, and 82.0° and 50.6° for June, respectively. Total precipitation for these three months was 3.24 in. (3.26 in. below normal). Nearly all visits were made during clear and calm weather. — RANDAL L. FAIRBANKS, CHARLES R. LEGROS, DAVID S. THORNE, and JOHN K. McBRIDE, Ecological Systems Division, Directorate of Installation Restoration, Rocky Mountain Arsenal, Denver, Colo. 80240.

**94. MIXED PRAIRIE (I).** — **Location:** Colorado; Adams Co., center of Section 35, T2S, R67W; 39°50'N, 104°51'W, Sable Quadrangle, USGS. **Continuity:** New.

**Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Grasses are dominant Blue Grama (*Bouteloua gracilis*) is dominant throughout the major portion of the plot. Needle-and-thread (*Stipa comata*), Sand Dropseed (*Sporobolus cryptandrus*), Squirrel-tail (*Sitanion longifolium*), and Cheat Grass (*Bromus tectorum*) are common and locally abundant. Grasses of lesser importance are Red Three-awn (*Aristida longiseta*), W. Wheat Grass (*Agropyron smithii*), and Six-weeks Fescue (*Vulpia octoflora*). The most abundant forbs are Copper Mallow (*Sphaeralcea coccinea*) and Bushy Eriogonum (*Eriogonum effusum*). Evening Primrose (*Oenothera* sp.), Snakeweed (*Gutierrezia sarothrae*), Russian Thistle (*Salsola kali*), W. Wallflower (*Erysimum asperum*), Slender-flowered Psoralea (*Psoralea tenuiflora*), Hairy Golden-aster (*Heterotheca villosa*), Flixweed (*Descurainia sophia*), and Narrow-leaved Goosefoot (*Chenopodium leptophyllum*) are also common. Fringed Sagebrush (*Artemesia frigida*) is frequent throughout the plot, while Winterfat (*Eurotia lanata*), Prickly-pear (*Opuntia compressa*), Starvation Cactus (*O. polyacantha*), and Ball Cactus (*Coryphantha vivipara*) are less frequent. Approximately two acres along the E border are encompassed by a Black-tailed Prairie Dog (*Cynomys ludovicianus*) town. **Edge:** Three sides are bordered by similar grassland; the N side by grassland dominated by Sand Dropseed and Cheat Grass. **Topography:** A small hill rises fairly steeply in the SE portion. The remainder of the plot is gently rolling. **Elevation:** 5240 to 5300 ft **Coverage:** April 22; May 13, 26; June 2, 10, 23; July 12, August 3; 0600-0920. Total man-hours: 6. **Census:** W Meadowlark, 2; Horned Lark, 1; Mourning Dove, + **Total:** 3 species; 3 territorial males (37/km<sup>2</sup>, 15/100 acres). **Remarks:** Three or four singing and displaying, male Lark Buntings were observed on the plot between May 13 and June 2, but none after June 2.

**95. MIXED PRAIRIE (II).** — **Location:** Colorado, Adams Co., east-central portion of Section 33, T2S, R67W; 39°50'N, 104°53'W, Commerce City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Blue Grama is dominant, although Sand Dropseed is locally abundant. Less frequent grasses are Needle-and-thread, Red Three-awn, and Squirrel-tail. Abundant forbs include Small White Evening-star (*Mentzelia nuda*), Aster sp., Copper Mallow, Hairy Golden-aster, W. Ragweed (*Ambrosia psilostachya*), and Slender-flowered Psoralea. Prairie Sunflower (*Helianthus petiolaris*), Horseweed (*Conyza canadensis*), Tall Eriogonum (*Eriogonum annuum*), Ground-cherry (*Physalis* sp.), and Russian Thistle are less common; and Croton (*Croton texensis*), Skeleton-weed (*Lygodesmia juncea*), Prairie-clover (*Dalea aurea*), and Prickly-pear are widely scattered. **Edge:** Bordered by similar vegetation on all sides. **Topography:** Gently rolling. **Elevation:** 5155 to 5170 ft. **Coverage:** April 20; May 18, 24; June 4, 10, 22; July 13, August 5; 0615-1000. Total man-hours: 5.9. **Census:** Horned Lark, 3 (37, 15); Mourning Dove, 1.5; W. Meadowlark, 1. **Total:** 3 species; 5.5 territorial males (68/km<sup>2</sup>, 28/100 acres).

**96. THREE-AWN GRASSLAND-PRAIRIE DOG TOWN.** — **Location:** Colorado; Adams Co., NW quarter of Section 29, T2S, R66W; 39°51'N, 104°48'W, Sable

**Quadrangle, USGS.** **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Heavily dominated by Red Three-awn and Cheat Grass Sand Dropseed and Squirrel-tail are common in small areas. The major forbs are Copper Mallow, Russian Thistle, *Kochia iranica*, Morning-glory (*Convolvulus arvensis*), Hairy Golden-aster, Canada Thistle (*Cirsium arvense*), W. Ragweed, and Evening-primrose. Less common forbs include Slender-flowered Psoralea, Prairie Sunflower, Tumble-mustard (*Sisymbrium altissimum*), Bracted Verbena (*Verbena bracteata*), False Boneset (*Kuhnia eupatorioides*), and Creeping White Prairie Aster (*Aster falcatus*). The plot is included within a large Black-tailed Prairie Dog town. **Edge:** Bordered by similar vegetation on all sides, except that the proportion of annual forbs increases and the proportion of perennial grasses decreases to the E, W, and N. A dirt road and power line runs parallel to the W border 20 yds. W, and a demolition area exists approximately 150 yds. S of the plot. **Topography:** Gently rolling. **Elevation:** 5230 to 5260 ft. **Coverage:** April 20; May 12, 25; June 3, 8, 21; July 14; August 2; between 0630 and 0930. Total man-hours 5.2. **Census:** Horned Lark, 3 (37, 15); Burrowing Owl, 2; W. Meadowlark, 1.5; Ferruginous Hawk, +; Grasshopper Sparrow, +. **Total:** 5 species; 8 territorial males (99/km<sup>2</sup>, 40/100 acres). **Remarks:** One Mourning Dove nest was located.

(*Calamovilfa longifolia*), and W. Wheat Grass are also common. Major forbs include Copper Mallow, Russian Thistle, W. Ragweed, Rough Pigweed (*Amaranthus retroflexus*), and Narrow-leaved Goosefoot. Other common forbs are Puncture-vine (*Tribulus terrestris*), Tumble-mustard, Tall Eriogonum, Bushy Eriogonum, Horseweed, and Hairy Golden-aster. **Edge:** Similar vegetation borders on all sides. A barbed wire fence runs parallel to and within a few yards of the E boundary. **Topography:** Gently rolling. **Elevation:** 5290 to 5310 ft. **Coverage:** April 19; May 25; June 1, 9, 23; July 14, August 3; between 0620 and 0925. Total man-hours 8.8. **Census:** Brewer's Sparrow, 3.5 (43, 18); Grasshopper Sparrow, 2; W. Meadowlark, 1.5; Mourning Dove, 1; Cassin's Sparrow, +. **Total:** 5 species; 8 territorial males (99/km<sup>2</sup>, 40/100 acres). **Remarks:** One Mourning Dove nest was located.

**99. SAND DROPSEED - NEEDLE-AND-THREAD GRASSLAND.** — **Location:** Colorado; Adams Co., south-central portion of Section 11, T3S, R67W, 39°48'N, 104°51'W, Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Grasses dominate, although a few scattered shrubs are present. A N-S and an E-W narrow dirt road each bisect the plot. A variety of forbs is present on these roadsides. Sand Dropseed is the major grass in the western two-thirds and Needle-and-thread dominates the remainder. Other important grasses are Cheat Grass and Red Three-awn. The few scattered shrubs consist of Rubber Rabbitbrush, Sand Sagebrush, and *Yucca glauca*. Common forbs are Hairy Golden-aster, W. Ragweed, Small White Evening-star, Ground-cherry, Croton, *Evolvulus nuttallianus*, Skeleton-weed, Russian Thistle, *Cryptantha fendleri*, and Tall Eriogonum. **Edge:** Bordered on the E, W, and half of the N side by similar grassland; on the remaining half of the N and SE by thickets of New Mexican Locust (*Robinia neomexicana*); and on the S by a paved, two-lane road and right-of-way with similar grassland beyond. **Topography:** Gently rolling with a small hill in the eastern third of the plot. **Elevation:** 5250 to 5280 ft. **Coverage:** April 19; May 14, 25; June 1, 15, 22; July 12, August 5; between 0610 and 1025. Total man-hours 4.7. **Census:** W. Meadowlark, 2; Black-billed Magpie, 0.5, Swainson's Hawk, +; Mourning Dove, +. **Total:** 4 species; 2.5 territorial males (31/km<sup>2</sup>, 13/100 acres) **Remarks:** One Swainson's Hawk nest was located.

**100. SAND DROPSEED GRASSLAND (I).** — **Location:** Colorado; Adams Co., NW quarter of Section 27, T2S, R67W, 39°51'N, 104°53'W, Commerce City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Grasses are dominant. Sand Dropseed and Cheat Grass are the major species; Needle-and-thread is common in small areas. Common forbs include Prickly Lettuce (*Lactuca scariola*), Russian Thistle, Skeleton-weed, Copper Mallow, White Pigweed (*Amaranthus albus*), and Ground-cherry. Morning-glory, Kochia, and Prairie Sunflower are locally common. **Edge:** Bordered by similar grassland on all sides. **Topography:** Gently rolling. **Elevation:** 5155 to 5170 ft. **Coverage:** April 20; May

12, 24; June 2, 10, 22; July 12; August 2; between 0620 and 1015. Total man-hours: 7.8. **Census:** Lark Bunting, 4 (49, 20); W. Meadowlark, 3.5 (43, 18); Mourning Dove, 1; Brewer's Sparrow, 1; Ring-necked Pheasant, +. **Total:** 5 species; 9.5 territorial males ( $117/\text{km}^2$ , 48/100 acres). **Remarks:** One Mourning Dove nest was located.

**101. SAND DROPSEED GRASSLAND (II).** — **Location:** Colorado; Adams Co., north-central portion of Section 4, T3S, R67W;  $39^\circ 49' \text{N}$ ,  $104^\circ 54' \text{W}$ , Commerce City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Grasses are dominant. Sand Dropseed is the major species throughout the greatest portion of the plot, with a few small areas dominated by either Cheat Grass or Needle-and-thread. Cheat Grass, Squirrel-tail, Red Three-awn, and Six-weeks Fescue are common beneath the Sand Dropseed canopy. Common forbs include Russian Thistle, Prairie Sunflower, Prickly Lettuce, Aster, Small White Evening-star, Croton, Copper Mallow, and Hairy Golden-aster. Narrow-leaved Goosefoot, Evolvulus, Ground-cherry, and Slender-flowered Psoralea are locally common. An E-W power line approximately 80 ft in height bisects the plot. **Edge:** Bordered by similar grassland on all sides. **Topography:** Relatively flat but gently sloping to the N. **Elevation:** 5185 to 5190 ft. **Coverage:** April 19; May 12, 24; June 4, 14, 24; July 12; August 5; 0630-0855. Total man-hours: 5.5. **Census:** W. Meadowlark, 3 (37, 15); Mourning Dove, 1; Brewer's Sparrow, +. **Total:** 3 species; 4 territorial males ( $49/\text{km}^2$ , 20/100 acres).

**102. SEDED GRASSLAND (I).** — **Location:** Colorado; Adams Co., east-central portion of Section 4, T3S, R67W;  $39^\circ 49' \text{N}$ ,  $104^\circ 53' \text{W}$ , Commerce City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Dominated by a mature, uniform stand of seeded Crested Wheat Grass with a low diversity of other grasses and forbs. Red Three-awn, Cheat Grass, Sand Dropseed, and Skeleton-weed are fairly common. Slender-flowered Psoralea, Russian Thistle, Copper Mallow, Ground-cherry, and Narrow-leaved Goosefoot are uncommon. **Edge:** Bordered on three sides by similar grassland and on the N by grassland dominated by Red Three-awn, Sand Dropseed, and Cheat Grass. A light industrial area lies within 200 yds W of the plot. **Topography:** Relatively flat. **Elevation:** 5195 to 5200 ft. **Coverage:** April 19; May 12, 24; June 4, 14, 24; July 12; August 5; 0600-1000. Total man-hours: 5.2. **Census:** W. Meadowlark, 2; Mourning Dove, 1; Grasshopper Sparrow, +. **Total:** 3 species; 3 territorial males ( $37/\text{km}^2$ , 15/100 acres).

**103. SEDED GRASSLAND (II).** — **Location:** Colorado; Adams Co., NE quarter of Section 29, T2S, R66W;  $39^\circ 51' \text{N}$ ,  $104^\circ 48' \text{W}$ , Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Dominated by a mature, uniform stand of seeded Crested Wheat Grass. Other less frequent grasses are Red Three-awn, Sand Dropseed, and Cheat Grass. W. Wheat Grass, Little Barley (*Hordeum pusillum*), and Squirrel-tail are

locally common. Copper Mallow is the only common forb. Russian Thistle, Hairy Golden-aster, Flixweed, and False Boneset are uncommon. **Edge:** Bordered by similar vegetation on three sides, with grassland dominated by Sand Dropseed bordering the W. A dirt road parallels the N border 30 yds N of the plot. **Topography:** Relatively flat. **Elevation:** 5235 to 5240 ft. **Coverage:** April 21, May 13, 25; June 3, 8, 21; July 12; August 2; 0625-0915. Total man-hours: 7.8. **Census:** Lark Bunting, 2.5; Grasshopper Sparrow, 2.5; Horned Lark, 2; W. Meadowlark, 2; Brewer's Sparrow, 2; Mourning Dove, 1.5. **Total:** 6 species, 12.5 territorial males ( $154/\text{km}^2$ , 63/100 acres).

**104. WEEDY FIELD (I).** — **Location:** Colorado, Adams Co., NE quarter of Section 1, T3S, R67W,  $39^\circ 49' \text{N}$ ,  $104^\circ 50' \text{W}$ , Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Dominated by weedy annuals. Musk Thistle (*Carduus leiocephalus*), Canada Thistle, Flixweed, and Kochia are the most abundant. Other common forbs are Prairie Sunflower, Evening-primrose, Spurge (*Chamaesyce* sp.), Alfalfa (*Medicago sativa*), Russian Thistle, Pepper-grass (*Lepidium* sp.), Fetid Marigold (*Dysosmia papposa*), Morning-glory, Tumble-mustard, Copper Mallow, Ground-cherry, Bracted Verbena, and Com. Pigweed (*Chenopodium album*). Grasses are uncommon. An E-W dirt road bisects the center of the plot, and a N-S dirt spur road runs through the N half of the plot. A recently disturbed 1.5 acre bare area containing only a few scattered annuals lies in the north-central portion. **Edge:** Bordered by similar vegetation on all sides. A canal, with scattered Plains Cottonwood (*Populus sargentii*) along its banks, borders the SW corner; and a cottonwood-lined, 40 acre reservoir lies 150 yds to the S. A large industrial area lies within 150 yds to the N and W. **Topography:** Flat. **Elevation:** 5620 ft. **Coverage:** April 19; May 12, 26; June 2, 8, 22; July 14; August 3; 0620-1005. Total man-hours: 5.6. **Census:** Ring-necked Pheasant, 1; Com. Yellowthroat, 1, W. Meadowlark, 1; teal (Blue-winged or Cinnamon), 0.5, Mourning Dove, 0.5; Lazuli Bunting, +. **Total:** 6 species, 4 territorial males ( $49/\text{km}^2$ , 20/100 acres). **Remarks:** One teal nest was located.

**105. WEEDY FIELD (II).** — **Location:** Colorado, Adams Co., south-central portion of Section 36, T2S, R67W;  $39^\circ 50' \text{N}$ ,  $104^\circ 50' \text{W}$ , Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Located on the edge of an unlined industrial waste basin dominated by weedy annuals. A shallow one-acre pond exists in the east-central portion, and approximately three acres of bare ground containing only scattered annuals occurs along the N and W borders. Common Sunflower, Copper Mallow, Evening-primrose, Horseweed, Prickly Lettuce, and Bushy Eriogonum are the most abundant forbs. W. Ragweed, Rocky Mountain Bee Plant (*Cleome serrulata*), Com. Evening-primrose (*Oenothera strigosa*), Prairie Sunflower, Canada Thistle, Ground-cherry, Creeping White Prairie Aster, Pepper-grass, and Gumweed (*Grindelia squarrosa*) are also common. Sand Dropseed and W. Wheat Grass occur in patches. Narrow-leaved

Cattail (*Typha angustifolia*) and Am. Bulrush (*Scirpus americanus*) are common in the pond, and N. Willow-herb (*Epilobium glandulosum*), Yellow Cudweed (*Gnaphalium chilense*), Showy Milkweed (*Asclepias speciosa*), Alkali Muhly (*Muhlenbergia asperifolia*), and Desert Salt-grass (*Distichlis stricta*) are abundant on the pond margins. **Edge:** Bordered on the W and N by portions of the industrial waste basin, on the E by similar vegetation and patches of bare ground, and on the S by similar vegetation and a gravel parking lot. A large industrial area lies within 200 yds. S of the plot. **Topography:** Relatively flat but gently sloping to the N. **Elevation:** 5235 to 5250 ft. **Coverage:** April 20; May 18, 26; June 1, 14, 22, July 14; August 3; 0620-0820. Total man-hours: 3.8 **Census:** Mourning Dove, 1; W. Meadowlark, 1. **Total:** 2 species; 2 territorial males (25/km<sup>2</sup>, 10/100 acres)

**106. WEEDY FIELD (III).** — **Location:** Colorado; Adams Co., NE quarter of Section 23, T2S, R67W; 39°52'N, 104°51'W, Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Weedy annuals are dominant. Prickly Lettuce is the major species throughout the greatest portion of the plot, although Canada Thistle and Flixweed are also abundant. The only other fairly common forbs are Kochia and Tumble-mustard. Little Barley is locally common and represents the only grass of any significance. **Edge:** Bordered by similar vegetation on all sides. A small marshy area dominated by Narrow-leaved Cattail lies within 150 yds. to the N. **Topography:** Relatively flat but gently sloping to the NE. **Elevation:** 5145 to 5160 ft. **Coverage:** April 20; May 12, 24, June 2, 10, 21; July 13; August 2; 0625-0955. Total man-hours: 7.8. **Census:** W. Meadowlark, 3 (37, 15); Red-winged Blackbird, 2.5; Ring-necked Pheasant, 1.5; Mallard, 0.5; Short-eared Owl, 0.5. **Total:** 5 species; 8 territorial males (99/km<sup>2</sup>, 40/100 acres). **Remarks:** One Mallard nest was located. Two or three singing and displaying male Lark Buntings were observed on the plot between May 12 and June 2 but none after June 2.

**107. WEEDY FIELD (IV).** — **Location:** Colorado; Adams Co., SE quarter of Section 24, T2S, R67W; 39°52'N, 104°50'W, Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Dominated by Cheat Grass and weedy forbs. The major forbs include Prickly Lettuce, Morning-glory, Musk Thistle, Flixweed, Kochia, and Tumble-mustard. Common Pigweed, Com. Purslane (*Portulaca oleracea*), Bushy Knotweed (*Polygonum ramosissimum*), Rough Pigweed, Canada Thistle, Bracted Verbena, Smooth Brome (*Bromus inermis*), W. Wheat Grass, and Stinkgrass (*Eragrostis cilianensis*) are locally common. **Edge:** Bordered by similar vegetation on all sides. An E-W gravel road and power line run parallel to the S border 20 yds. S of the plot, and a clump of ten large Plains Cottonwood occurs just S of the road. **Topography:** Flat but gently sloping to the N. **Elevation:** 5170 to 5180 ft. **Coverage:** April 20; May 17, 24; June 3, 14, 21; July 13; August 2; 0615-0940. Total man-hours: 7.2 **Census:** W. Meadowlark, 3.5 (43, 18); Com. Yellowthroat, 1.5; N. Oriole, 0.5; Marsh Hawk, +; Ring-

necked Pheasant, +; Short-eared Owl, +; W. Kingbird, +. **Total:** 7 species; 5.5 territorial males (68/km<sup>2</sup>, 28/100 acres).

#### 108. WEEDY FIELD - PRAIRIE DOG TOWN. —

**Location:** Colorado; Adams Co., SE quarter of Section 26, T2S, R67W; 39°51'N, 104°51'W, Sable Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, 835 x 1044 ft, surveyed). **Description of Plot:** Dominated by weedy annuals but also contains a large proportion of perennial forbs and grasses. Cooper Mallow, Rough Pigweed, Spurge, Evening-primrose, Tumble-mustard, *Bassia hyssopifolia*, Crownbeard (*Verbesina encelioides*), and Hairy Golden-aster are the dominant forbs. Spiny Goldenweed (*Haplopappus spinulosus*), Flixweed, and W. Ragweed are also common. Cheat Grass is the dominant grass, while Red Three-awn and W. Wheat Grass are locally abundant Yucca is scattered over the N half of the plot. A large Black-tailed Prairie Dog town encompasses the plot. **Edge:** Bordered by similar vegetation on all sides, although asphalt two-lane roads and power lines run parallel to the E and S borders 20 yds. E and 90 yds S of the plot, respectively. The Prairie Dog town does not extend beyond the W or N borders. **Topography:** Gently rolling. **Elevation:** 5230 to 5250 ft. **Coverage:** April 19, May 12, 24; June 2, 15, 23; July 13; August 3; 0615-1040. Total man-hours: 4.6 **Census:** Burrowing Owl, 1.5, W. Meadowlark, 0.5; Mourning Dove, +. **Total:** 3 species, 2 territorial males (25/km<sup>2</sup>, 10/100 acres).

#### 109. MIXED HABITAT-DISTURBED BOTTOM-LAND. —

**Location:** Oklahoma; Washington Co., Dewey, 2 mi. W of intersection of Ninth St and Hwy 75 and 0.3 mi. N on E bank of Caney River; 36°48'N, 95°58'W, Tulsa Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 40.47 ha = 100 acres (irregular rectangle roughly 600 x 800 yds. determined from SCS aerial map). **Description of Plot:** See AB 26:976-977 (1972). **Weather:** A cool, dry spring, five count days were clear, with others cloudy to partly cloudy. Three days in early May had lows in the mid-30s. **Coverage:** April 5, 13, 21, 27; May 6, 14, 19, 31; June 19, 26; 0615-1140 hours, but one trip 1245-1525 hours. Total man-hours: 38. **Census:** Indigo Bunting, 16.5 (41, 17), Blue-gray Gnatcatcher, 13.5 (33, 14); Cardinal, 9 (22, 9), Red-winged Blackbird, 8 (20, 8); Com. Yellowthroat, 7 (17, 7); Brown-headed Cowbird, 7; Ruby-throated Hummingbird, 6 (15, 6); Yellow-billed Cuckoo, 4.5 (11, 5), Blue Jay, 4.5; Tufted Titmouse, 4.5; Carolina Chickadee, 4 (10, 4); Dickcissel, 4; Red-headed Woodpecker, 3 (7, 3), Downy Woodpecker, 3; Carolina Wren, 3; Am. Goldfinch, 2.5; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Red-eyed Vireo, 2; Yellow-breasted Chat, 2; Painted Bunting, 2; White-breasted Nuthatch, 1.5; Field Sparrow, 1.5; Bobwhite, 1; Killdeer, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; Rough-winged Swallow, 1; Gray Catbird, 1; White-eyed Vireo, 1; Bell's Vireo, 1; N. Parula, 1; Kentucky Warbler, 1; E. Meadowlark, 1; Summer Tanager, 1; Pileated Woodpecker, 0.5; Acadian Flycatcher, 0.5; Brown Thrasher, 0.5; Warbling Vireo, 0.5; Prothonotary Warbler, 0.5; Orchard Oriole, 0.5; Scissor-tailed Flycatcher, +. **Total:** 42 species; 128 ter-

ritorial males ( $316/\text{km}^2$ , 128/100 acres). **Remarks:** A fire, set by a landowner S of the plot, spread through the dry cattail marsh April 4, and was still smoldering on the first day of the count. Except for puddles after rains, the marsh was dry through the period, and the purification ponds were the only water source. Numbers of male Red-winged Blackbirds varied from visit to visit, both at the marsh and ponds; few females were seen. Indigo Bunting numbers were down in areas with no noticeable habitat change. One Indigo nest held three cowbird eggs. The Gray Catbird, Brown Thrasher, and White-eyed and Warbling Vireos were new species. — *ELLA DELAP, 409 N Wyandotte, Dewey, Ok. 74029.*

**110. COASTAL PRAIRE: DREDGED MATERIAL DISPOSAL SITE.** — **Location:** Texas; Chambers Co., on N bank of the Gulf Intracoastal Waterway, 1500 ft E of the swing bridge on TX 124;  $29^\circ 33' \text{N}$ ,  $94^\circ 22' \text{W}$ , Mud Lake Quadrangle, USGS. **Continuity:** New. (1975) **Size:** 11.9 ha = 29.4 acres (rectangular, 3200 ft x 400 ft; oriented N39°E (true), paced with compass). **Description of Plot:** Dredged material from G.I.W.W. was initially placed on the S half of the plot between 1931 and 1933. Mounds (5) were created at 600 ft intervals at pipeline discharge points; mound diameters varied from approximately 175 to 225 ft. Additional disposals took place on the same area in 1952 and 1965. The disposal sites were diked during all three disposal periods so that slurry flowed N away from the G.I.W.W. Vegetation on the plot was quantitatively surveyed in August 1974 using a random quadrat method. No trees are present. A Sea Oxeye (*Borrichia frutescens*) - Gulf Coast Cordgrass (*Spartina spartinae*) association is established on the dredged material and comprises 40.1% (11.8 acres) of the plot. Sea Oxeye and Silverling (*Baccharis halimifolia*) dominate the shrub layer and have a density (stems/acre) of 18,182 and 1509 respectively. The shrub canopy averages 3 ft in height. Gulf Coast Cordgrass, Boneset (*Eupatorium serotinum*), and Broomsedge (*Andropogon ternarius*) are the dominant herbs. Per cent cover by each is Gulf Coast Cordgrass, 7.5; Boneset, 6.8; Broomsedge, 5. A Silverling-Salt Meadow Cordgrass (*Spartina patens*) association borders the former association on the N and extends to the N plot boundary. The Silverling-Salt Meadow Cordgrass association covers 49.7% (14.6 acres) of the plot. Silverling and Sea Oxeye are the dominant shrubs and have a density (stems/acre) of 2742 and 2448 respectively. Shrub canopy height averages 6 ft. Salt Meadow Cordgrass is the dominant herb and covers 75% of the herb layer. Silverling-Com. Reed (*Phragmites communis*) associations comprise 2% (0.6 acre) of the plot and are scattered throughout. A shrub layer occurs along the outer peripheries of these associations; shrub canopy heights range from 2 to 5 ft. Silverling is the sole species present and has a density of 2529 stems/acre. Common Reed is the only herb present, covering 100% of the herb layer, and attaining a height of 12 ft. Unvegetated areas comprise 7.5% (2.2 acres) of the plot and are also scattered throughout. The term "unvegetated" is somewhat incorrect as a few of these areas are actually covered by a very sparse layer of short-lived spring and early summer annuals and plants with long rhizome systems that have extended in from adjacent associations. Most common

are Seaside Heliotrope (*Heliotropium curassavicum*), Rush (*Juncus* sp.), and *Paspalum vaginatum*. A drainage ditch bordered by Water Hyssop (*Bacopa monnieri*) comprises 0.7% (0.2 acre) of the plot and is located near the W border. The ditch has been plugged at its S terminus by dredged material. Vegetation on the plot is periodically burned by lightning-caused ground fires. **Edge:** Bordered by similar plant associations on the N, E, and W; by the G.I.W.W. on the S. The S edge is subject to rapid erosion by wake action created by passing barges. The rate of erosion is probably measureable in ft/year. **Topography:** Essentially flat on the N half; rises fairly abruptly on the S, especially where large mounds have been created at pipeline discharge points. **Elevation:** 2 ft above mean sea level on the N half; rises to 10 ft along the S edge except on the larger mounds where elevations reach 15 ft. **Weather:** Overcast, 10-15 mph winds on 2 days; clear and calm on all others. Morning temperatures were in the mid 70s. **Coverage:** May 16-21, 0600-0900 hours. Total man-hours: 21.5. **Census (1975):** Red-winged Blackbird (females), 34 (286, 116); Com. Yellowthroat, 6 (50, 20); Com. Nighthawk, 3 (25, 10), Brown-headed Cowbird (females), 3; E. Meadowlark, 1. **Total:** 5 species; 47 territorial males or females ( $395/\text{km}^2$ , 160/100 acres). **Remarks:** Nine male Red-winged Blackbirds established territories on the plot. Harem sizes ranged from 1 to 6. Nests found (34) Red-winged Blackbird, 31; Com. Nighthawk, 3. All Red-winged Blackbird nests were in Silverlings. All Com Nighthawk nests were in shallow, sandy depressions located along unvegetated area peripheries. Four Red-winged Blackbird nests were parasitized by Brown-headed Cowbirds; at least 2 were subsequently abandoned. This census was performed in an effort to gather baseline data for description of plant and animal succession patterns on U.S. Army, Corps of Engineers (COE) dredged material disposal sites. The study was supported by the COE, Waterways Experiment Station, Vicksburg, MS under grant number DACW 39-74-C-0092 — *STEPHEN B. ATKINS, RONALD G. PSCION, and DAVID M. DuMOND, Coastal Zone Resources Corp., Wilmington, N. C. 28401.*

**111. DISTURBED RIPARIAN STREAM BORDER.** — **Location:** California; Solano Co., Lake Solano Co Park (campground), along the S bank of Putah Creek 4 mi. SW of Winters;  $38^\circ 36' \text{N}$ ,  $122^\circ 2' \text{W}$ , Mt. Vacavita Quadrangle, USGS. **Continuity:** Established 1973, 3 intermittent years. **Size:** 6.37 ha = 15.7 acres (approximately rectangular 240 x 2850 ft, paced). **Description of Plot:** See AB 27: 1005 (1973). Dominant canopy, understory, and groundcover species remain as in 1973. Minimal landscaping has been added to the area, and the groundcover is well trampled in early spring after several weekends of heavy usage. A quantitative analysis of the vegetation in 1975 shows: Trees, 3-inches diameter and over, based on five 0.1-acre circular samples, 234/acre; total basal area 55.2 ft<sup>2</sup>/acre. Species comprising 96.3% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence) Fremont Cottonwood (*Populus fremontii*), 78, 33, 48.6, 60, willow (*Salix* spp.), 70, 30, 13.4, 80; Black Walnut (*Juglans nigra*), 66, 28, 31.9, 80; Elderberry (*Sambucus*

*mexicana*), 8, 3, 1.4, 20; Box-elder (*Acer negundo*), 6, 3, 1, 20. Trees by diameter size class [figures after each class give number of trees/acre, relative density (%), basal area (ft<sup>2</sup>/acre), relative dominance (%):] A (3-6 in.) 158, 68, 15.8, 28.6; B (6-9 in.) 46, 20, 13.4, 24.3; C (9-15 in.) 26, 11, 20.8, 37.7; D (15-21 in.) 4, 2, 5.2, 9.4. Shrub stems/acre 17,400; ground cover 69%; canopy cover 60%, average canopy height 42.4 ft (range 37-50). Also present, but not surveyed, are several large Valley Oaks (*Quercus lobata*) which provide habitat and food sources for many birds. **1975. Weather:** Hot and dry; 14 days were above 90°F, and only 0.2 in. of rain (0.95 in. below normal) fell. **Coverage:** April 20; May 5-6, 8, 12, 16, 22-23, 28, June 4; 10 trips, 1645-1930 hours and 0550-0800 hours, PDT. Total man-hours: 76. **Census:** Starling, 17 (268, 108); Scrub Jay, 9 (142, 57); Brown Towhee, 8 (126, 51); Plain Titmouse, 6 (94, 38); Rufous-sided Towhee, 6; Com. Bushtit, 5 (79, 32); California Quail, 4 (63, 25); Black-headed Grosbeak, 4; Acorn Woodpecker 3 (47, 19); Downy Woodpecker, 3; Com. Flicker, 2; Nuttall's Woodpecker, 2; Ash-throated Flycatcher, 2; Bewick's Wren, 2; California Thrasher, 2; Am. Robin, 2; Swainson's Thrush, 2; House Sparrow, 2; Song Sparrow, 2; Anna's Hummingbird, 1. **Total:** 20 species; 84 territorial males (1322/km<sup>2</sup>; 535/100 acres). **Remarks:** Nests found, 15 Com. Flicker, 1; Acorn Woodpecker, 1; Com. Bushtit, 2, Am. Robin, 2; Starling, 9. The bridge at the NE corner provided nesting sites for a large colony of Cliff Swallows. A dramatic (53%) increase in nesting Starlings has occurred since 1973; generally they foraged in pasture land away from the plot. Comparison with the 1973 census shows Ash-throated Flycatcher and Nuttall's Woodpecker most affected by the Starling increase. **1976. Weather:** Hot and dry; 6 days above 90° and no precipitation. The preceding winter was exceptionally dry, Oct.-Feb. 11.8 in. below normal. **Coverage:** May 18-19, 21-22, 25, 27-28; June 2-4; 0530-1030 hours, PDT. Total man-hours: 23. **Census:** Starling, 18 (283, 115); Scrub Jay, 8 (126, 51); Plain Titmouse, 5 (79, 32); Bewick's Wren, 5; Com. Bushtit, 4 (63, 25); Song Sparrow, 4; House Sparrow, 3 (47, 19); Rufous-sided Towhee, 3; Brown Towhee, 3; California Quail, 2; Acorn Woodpecker, 2; Nuttall's Woodpecker, 2; Red-winged Blackbird, 2; Brown-headed Cowbird, 2; Black-headed Grosbeak, 2; Mourning Dove, 1; Com. Flicker, 1; Downy Woodpecker, 1; Black Phoebe, 1; White-breasted Nuthatch, 1; California Thrasher, 1; Am. Robin, 1; Swainson's Thrush, 1; N. Oriole, 1. **Total:** 24 species; 74 territorial males (1165/km<sup>2</sup>, 471/100 acres). **Remarks:** Nests found, 11: Starling, 6; Scrub Jay, 2; Com. Flicker, 1, Nuttall's Woodpecker, 1; Am. Robin, 1. Family groups observed, 18: Scrub Jay, 4; Com. Bushtit, 4; Bewick's Wren, 4; California Quail, 2; Plain Titmouse, 2, Rufous-sided Towhee, 1; Song Sparrow, 1. The extremely dry, warm winter and spring may have caused exceptionally early nesting in many species. By May 21 much of the groundcover and understory had begun to turn brown and dry out. The number of Starlings remained fairly constant from 1975 to 1976, but other cavity-nesting individuals decreased from 12 to 7 (42%). Ash-throated Flycatchers decreased from 5 territorial males in 1973 to 2 in 1975, and to visitor status in 1976. It is felt that competition with Starlings strongly affects

these flycatchers. — *KELLER McDONALD, BOB JENSEN, RICK MCROSTIE, Avian Science Dept., University of California, Davis, Calif. 95616.*

## 112. INSULAR SCRUB OAK WOODLAND. —

**Location:** California; Santa Barbara Co., Santa Cruz Island, 1/8 mi. NE of Channel Islands Field Station, 34°N, 119°42'W, Santa Cruz Island B Quadrangle, USGS. Photograph of study plot on file at Channel Islands Field Station. **Continuity:** New. **Size:** 4.3 ha = 10.6 acres (irregular, area determined from aerial photograph). **Description of Plot:** Located on lower portion of steep, south-facing slope; transected by three deeply cut gullies, which converge at base of slope onto a more shallowly sloped drainage fan. Woody vegetation concentrated in areas of higher moisture content and suitable soil conditions to the sides and bottoms of the three major gullies and to the shallowly sloped drainage fan. Analysis of vegetation within these patches, based on four 0.1-acre circular samples, yielded the following results. Trees, 3-inches diameter and over: 410/acre Species comprising 90% of the total number of trees Scrub Oak (*Quercus dumosa*), 323, 79, 98, 100, *Ceanothus insularis*, 55, 11, 1, 75. As both of these species commonly grow from large basal burls, major trunks originating from a single burl were recorded as individual trees. Owing to its long-standing isolation from mainland fire cycles, the island chaparral is characteristically larger than similar mainland vegetation. Dimensions of *Q. dumosa* are: average trunk diameter at ground level, 6 in.; average tree height, 16 ft Miscellaneous tree species include: Mountain-mahogany (*Cercocarpus betuloides*), Catalina Cherry (*Prunus lyonii*), Buckthorn (*Rhamnus crocea*), Laurel Sumac (*Rhus laurina*), Sugar Bush (*Rhus ovata*), Pepper (*Schinus molle*), willow (*Salix* sp.), and Coast Live Oak (*Q. agrifolia*). The single representative of *Q. agrifolia* (approximately 45 ft high, 25 in. dbh) in the upper portion of the central gully, where small amounts of water flow from a permanent spring. This area also supports a dense thicket of *Salix* (approximately 25 ft high), this species also occurs in a limited amount in the western gully of the plot. Major shrub species include: Chaparral Broom (*Baccharis pilularis*), Mule Fat (*Baccharis viminea*), California Sagebrush (*Artemesia californica*), Poison Oak (*Rhus diversiloba*), Mountain-mahogany, Wild Cucumber (*Marah macrocarpus*), and Monkey-flower (*Mimulus longiflorus* and *M. flemingii*). Canopy cover 85%; vegetation form low and spreading (average distance from ground to lowest branches 4.5 ft.). Ground cover, 90%; consisting mainly of several species of grasses and herbaceous annuals. The dry, rocky ridges separating the main gullies support only sparse, patchy vegetation (in most cases only one or two individual plants), consisting of the following principal species (in order of decreasing abundance): Prickly-pear (*Opuntia occidentalis*), *Ceanothus insularis*, Scrub Oak Mountain-mahogany, Chamise (*Adenostoma fasciculatum*), and Sugar Bush. Ground cover on ridges practically non-existent owing to an unusually dry winter and severe overgrazing by feral sheep. In summary, the south-facing slope habitat is characterized by very patchy vegetational distribution, with drainage areas supporting very dense Scrub Oak woodland and intervening ridges very low

densities of typical chaparral species. **Edge:** Slope above plot supports increasingly sparse vegetation continuous with that described above; the lower edge is bounded by an extensive wash densely vegetated with *B. viminea*. The lower half of the plot is bounded on either side by fenced, grassy fields; continuous habitat extends E and W from the upper half. **Elevation:** 200-750 ft. **Coverage:** March 29, April 30; May 1-3, 7-9, 10, 15; seven trips beginning at 0600 hours and three at 1730 hours. Total man-hours: 15 Partial censuses on 12 additional days. Total man-hours: 40. **Census:** Bewick's Wren, 4; (93, 38); Orange-crowned Warbler, 4; Rufous-crowned Sparrow, 3.5 (82, 33); Anna's Hummingbird, 3 (70, 28); Scrub Jay, 3; Com. Bushtit, 3; Rufous-sided Towhee, 3; Blue-gray Gnatcatcher, 1.5; Allen's Hummingbird, 1; Hutton's Vireo, 1. **Total:** 10 species; 27 territorial males ( $639/\text{km}^2$ ,  $255/100 \text{ acres}$ ). **Remarks:** Territories of all species were mainly associated with the dense woodland vegetation in the drainage areas; while the sparse vegetation found along the ridges was frequently included within these territories, in no case did a pair of any species entirely restrict its activities to this apparently marginal habitat. Special thanks to Charles T. Collins for his field assistance and suggestions. Also, I am indebted to Carey Stanton, for permission to use the island, and to Lyndal Laughrin of the Channel Islands Field Station. Financial support for certain aspects of this study was provided, in part, by the American Museum of Natural History's Chapman Fund, the El Dorado Audubon Society, and the Pasadena Audubon Society. — **JONATHAN ATWOOD**, Dept. of Biology, Calif. State Univ. Long Beach, Calif. 90840.

**113. Sycamore-Coast Live Oak-Riparian Woodland.** — **Location:** California; Orange Co., on Starr Ranch Audubon Sanctuary, in Bell Canyon, 4.5 mi. SE of Trabuco Canyon P. O. (5 mi. N of the entrance to Ronald W. Caspers Regional Park on Ortega Hwy);  $33^\circ 36' 30''\text{N}$ ,  $117^\circ 34' \text{W}$ , Canada Gobernadora Quadrangle, USGS. **Continuity:** New. **Size:** 6.8 ha = 16.8 acres (roughly rectangular, 575 x 1657 ft. in extreme dimensions, with long sides approximately N-S; surveyed with hand-held compass and measured with steel tape). **Description of Plot:** Canyon-bottom riparian woodland with an intermittent stream cutting through plot in N-S direction. Water is usually present after the first heavy rains of the season and remains through mid-July. A N-S dirt road also runs more or less through the middle of the plot. Dominant canopy trees are California Live Oak (*Quercus agrifolia*) and California Sycamore (*Platanus racemosa*). Most prominent in the understory are young California Live Oak, Lemonadeberry (*Rhus integrifolia*) and California Sagebrush (*Artemesia californica*); Redberry (*Rhamnus crocea*) and Laurel Sumac (*Rhus laurina*) are distributed through the area and in some places there is a great deal of Poison Oak (*Toxicodendron diversilobum*). Along the streambed is considerable Seep-willow (*Baccharis glutinosa*) and some willow (*Salix* sp.). The ground cover consists primarily of a thick growth of various unidentified grasses. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on five 0.1-acre circular samples, 132/acre; total basal area  $143.2 \text{ ft}^2/\text{acre}$ . Species comprising 100% of the total number of trees

(figures after each give number of trees/acre, relative density in %, relative dominance, frequency, in the sequence): California Live Oak, 86, 65, 65, 10; California Sycamore, 28, 21, 12, 60; dead trees, 14, 11, 22, 100, White Alder (*Alnus rhombifolia*), 4, 3, 3, 20. Trees by diameter size class (figures after each class give number of trees/acre, relative density in %, basal area in  $\text{ft}^2/\text{acre}$ , relative dominance in %, in that sequence): A (3-6 in.) 42, 32, 4.2, 3; B (6-9 in.) 30, 23, 9.0, 6; C (9-15 in.) 30, 23, 24.0 17; D (15-21 in.) 14, 11, 25.2, 18; E (21-27 in.) 6, 5, 18.6, 13; F (27-33 in.) 4, 3, 19.6, 14; G (33-40 in.) 6, 5, 42.6, 30. Shrub stems/acre, 94,400; ground cover 80%, canopy cover 62%; average canopy height 48 ft (range 38-58). **Edge:** Bordered to the E and W by more or less gentle slopes covered with scattered growths of White Sage (*Salvia apiana*), California Sagebrush, Laurel Sumac, Prickly-pear Cactus (*Opuntia* sp.) and Wild Buckwheat (*Eriogonum fasciculatum*); bordered on the N and S by contiguous riparian woodland. **Topography:** Flat canyon bottom. **Elevation:** 740 ft. **Weather:** Maximum temperatures  $60^\circ$  to  $94^\circ\text{F}$ , averaging  $74.4^\circ$  for the month of May. Most early mornings were overcast with coastal fog which drifted overhead and usually dissipated by 0900 hours. Precipitation: 0.03 in. **Coverage:** May 3-4, 10, 17-19, 21, 26; 0430-0930 hours, PST. Total man-hours 62. **Census:** House Wren, 13.5 (199, 80); Starling, 13 (191, 77); Ash-throated Flycatcher, 6 (88, 36); Rufous-sided Towhee, 5 (74, 30); Brown Towhee, 4.5 (66, 27); Scrub Jay, 4 (59, 24); Plain Titmouse, 4; Com. Bushtit, 4; Orange-crowned Warbler, 3.5 (51, 21); White-breasted Nuthatch, 2.5; Bewick's Wren, 2.5; Black-chinned Hummingbird, 2; Com. Flicker, 2; W. Wood Pewee, 2; Hutton's Vireo, 2; N. Oriole, 2; Lesser Goldfinch, 2; Nuttall's Woodpecker, 1.5; Black-headed Grosbeak, 1.5; Mourning Dove, 1; Acorn Woodpecker, 1; W. Flycatcher, 1; W. Bluebird, 1; Yellow Warbler, 1; House Finch, 1; Lawrence's Goldfinch, 1; Song Sparrow, 1; Am. Kestrel, 0.5; Anna's Hummingbird, 0.5; Red-tailed Hawk, +; Barn Owl, +. **Total:** 31 species; 88 territorial males or females ( $1294/\text{km}^2$ ,  $524/100 \text{ acres}$ ). **Visitors:** Red-shouldered Hawk, California Quail, Wrentit, Phainopepla, Rufous-crowned Sparrow. **Remarks:** 29 nests of the following species were located: Starling, 13, House Wren, 7; Black-chinned Hummingbird, 2; Red-tailed Hawk, 1; Anna's Hummingbird, 1; Ash-throated Flycatcher, 1; White-breasted Nuthatch, 1; Bewick's Wren, 1; W. Bluebird, 1; Brown Towhee, 1. Special thanks to David R. Bontrager for help with the vegetation survey and general encouragement. — **BOB and RUTH LOVELESS**, Starr Ranch Audubon Sanctuary, PO Box 157, San Juan Capistrano, Calif. 92675.

**114. Maple Thicket.** — **Location:** Utah; Cache Co., W border begins 0.5 mi. E of Green Canyon Cave on the S side of Green Canyon Rd,  $41^\circ 46' 24''\text{N}$ ,  $111^\circ 45' \text{W}$ , Smithfield Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 4.86 ha = 12 acres. **Description of Plot:** See AB 29: 1124 (1975). **Coverage:** May 16, 23, 30; June 6, 20, 27; 0700-1100, and 1400-1700. Total 14.5 party-hours or 53 man-hours. **Census:** Warbling Vireo, 17, (350, 142), Lazuli Bunting, 14 (288, 117); Chipping Sparrow, 5 (103, 42); Orange-crowned Warbler, 4 (82, 33); Calliope Hummingbird, 2; Swainson's Thrush, 2; Cassin's Finch, 1. **Total:** 7 species, 45 territorial males ( $927/\text{km}^2$ ,  $375/100$

acres) **Remarks:** Nest: Cassin's Finch, 1. Evidence of nesting pairs was as follows: Lazuli Bunting (6), Warbling Vireo (3), Chipping Sparrow (2), Swainson's Thrush (2), Calliope Hummingbird (1). There was a large cicada outbreak during the last half of June. The apparent increase from 26 to 45 territorial males is partly a result of the late coverage last year (only 2 trips before June 21). Conducted as a Bridgerland Audubon project by Robert Clemans, Alice Lindahl, Shawn Murphy, Rick and Judi Nunes, Dave and Ann Schimpf, and Jan Young. — *RICK NUNES, 142 W. Center St., Logan, Utah, 84321.*

**115. FLOODPLAIN COTTONWOOD FOREST.** — **Location:** Colorado; Weld Co., on W bank of S Platte River about 6 mi. S and 1.5 mi. E of Johnstown, extending from confluence of St. Vrain Creek and S Platte River S about 0.7 mi. Parts of Sects. 34&35, T4N, R67W; 40°16'N, 104°52'W, Milliken Quadrangle, USGS. **Continuity:** Established 1973; 4 consecutive years. **Size:** 52.2 ha = 128.9 acres (measured from an aerial photo with planimeter). **Description of Plot:** See AB 27: 997 (1973). **Weather:** Mostly clear, dry and warm. **Coverage:** May 6, 13, 23, 31; June 7, 13, 21; July 2; 0620-0945. Total man-hours 18. **Census:** House Wren, 34 (65, 26); Starling, 29 (56, 22), Com. Flicker, 10 (19, 8); Mourning Dove, 7 (13, 5), Com. Yellowthroat, 7; Brown-headed Cowbird (females), 7; Killdeer, 5 (10, 4); E. Kingbird, 5; Am. Robin, 5; Red-headed Woodpecker, 4 (8, 3); Spotted Sandpiper, 3 (6, 2); Downy Woodpecker, 3; Black-capped Chickadee, 3; W. Meadowlark, 3; N. Oriole, 3; Mallard, 2; Am. Kestrel, 2; Black-billed Magpie, 2; Brown Thrasher, 2; Lazuli Bunting, 2; Song Sparrow, 2; Ring-necked Pheasant, 1; Belted Kingfisher, 1; Rough-winged Swallow, 1; Blue Jay, 1; Yellow-breasted Chat, 1; Blue Grosbeak, 1; Am. Goldfinch, 1. **Total:** 28 species; 147 territorial males and female cowbirds (282/km<sup>2</sup>, 114/100 acres). **Remarks:** An increase in total species from 14 in 1975 to 27 may be attributed to a change of observers. Numbers of territorial males increased for 23 species, decreased for 4, and remained unchanged for 2. Largest increases were noted in Starling from 20 in 1975 to 29 and Killdeer from 0 to 5. Red-winged Blackbirds and Great Horned Owls were not territorial, yet a pair of Great Horned Owls was observed with young near the plot. This study is an environmental monitoring program evaluating the effects of the Fort St. Vrain Nuclear Generating Station. — *HERMAN J. GRIESE, Dept. of Fishery and Wildlife Biology, Colorado State Univ., Fort Collins, Colo. 80523.*

**116. FLOODPLAIN COTTONWOOD FOREST.** — **Location:** Colorado; Jefferson Co., about 10 mi. SW of Denver, NE/4, Sec. 14, T6S, R69W, 6th PM; 39°32'N, 105°5'W, Littleton Quadrangle, USGS. **Continuity:** Established 1971; 6 consecutive years. **Size:** 9.7 ha = 24 acres. **Description of Plot:** See AB 25: 966-967 (1971). **Weather:** Drier than usual. **Coverage:** March 21, 27; April 9, 18; May 23, 29, 31; June 6, 26; July 3, 18; August 15, 0700-1400 hours. Total man-hours: 23. **Census:** Great Blue Heron, 32 (329, 133); House Wren, 28 (288, 117); Starling, 11 (113, 46); Yellow Warbler, 11; Com. Yellowthroat, 8 (82, 33); N. (Bullock's) Oriole, 7 (72, 29); Am. Robin, 6 (62, 25); Com. Flicker, 5 (51, 21); Mourning Dove, 4.5 (46, 19); *Passerina* buntings, 4 (41, 17)

(Lazuli, 3; Indigo, 0.5; hybrid, 0.5); E. Kingbird, 3 (31, 13); W. Meadowlark, 3; Am. Goldfinch, 3; Am. Kestrel, 2; Warbling Vireo, 2; Song Sparrow, 2; Rufous-sided Towhee, 1.5; Mallard, 1; Great Horned Owl, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Yellow-breasted Chat, 1; Red-winged Blackbird, 0.5. **Total:** 25 species plus one hybrid; 139.5 territorial males (1436/km<sup>2</sup>, 581/100 acres). Excluding the colonial nesting herons, 107.5 territorial males (1107/km<sup>2</sup>, 448/100 acres). **Remarks:** The ratio of live to dead trees remains about the same-about 75% dead from the deprivation of water described in 1974. The reservoir level has not changed much from the beginning of last year; it receded from the peak at the end of the 1975 nesting season. Since the beginning of the census Great Blue Herons have steadily increased, from 9 nests in 1971 to 32 this year; the obvious cause is the protection of the nesting site and the development of a large, protected feeding area at the reservoir. Opening both shores of the reservoir to fishing, and eventually to boating, may have a future effect upon the herons. Among other species, canopy nesters have declined, not unexpectedly. Yellow Warblers and robins have dropped to half their average of the first four years. Cavity-nesting species showed no definite pattern. Flickers increased from 1 pair to 5, Downy Woodpeckers disappeared. House Wrens, which increased by 20% during the first 2 years of dead trees, dropped back to their previous level this year. Starlings increased, kestrels maintained probably the maximum supportable population within a grove this size. Birds preferring edge habitat maintained stable numbers (orioles, buntings, E. Kingbirds). Birds nesting in brush, usually only one or two pairs per species, also continued stable, except for yellowthroats — which were twice their previous average. We recorded 2 new species this year W. Meadowlark and Red-winged Blackbird. We found 62 nests, including 32 herons, 9 Starlings, 6 House Wrens, 5 robins, 3 flickers, 2 orioles, and one each of Mallard, owl, dove, kingbird, and magpie. — *NANCY HURLEY, URLING KINGERY, HUGH KINGERY (compiler), 869 Milwaukee Street, Denver, Colo., 80206*

**117. RESERVOIR SHORELINE COTTONWOOD FOREST.** — **Location:** Colorado; Adams Co., Barr Lake State Park, 3 mi. SE of Brighton; parts of sections 23, 26 and 27, T1S, R66W, 39°57'N, 104°45'W, Brighton and Mile High Lakes Quadrangles USGS. **Continuity:** Established 1975. **Size:** 29 ha = 72 acres (determined from aerial photographs). **Description of Plot:** See AB 29: 1130-1131 (1975). **Weather:** Similar to 1975. Highs from upper 70s to lower 90s F; wind slight; no more than 0.5 in. of precipitation. **Coverage:** May 28; June 4, 13, 24, July 2, 10, 29; August 8; between 0700 and 1145 hours, averaging 3 hrs in length, in warm, sunny, calm weather Total man-hours: 23.5. **Census:** House Wren, 13 (45, 18), Com. Yellowthroat, 12 (41, 17); Starling, 10 (34, 14), Red-winged Blackbird, 10; N. (Bullock's) Oriole, 9 (31, 13); Mourning Dove, 8 (27, 11); Mallard, 6 (21, 8), E Kingbird, 5 (17, 7); Com. Grackle, 5; Black-billed Magpie, 4 (14, 6); Am. Robin, 4; Yellow Warbler, 4; Blue Grosbeak, 4; Com. (Red-shafted) Flicker, 3 (10, 4), Downy Woodpecker, 3; Black-capped Chickadee, 3, Warbling Vireo, 2; Brown-headed Cowbird, 2; Am

Kestrel, 1; Great Horned Owl, 1; W. Wood Pewee, 1; Orchard Oriole, 1; Black-headed Grosbeak, 1; Lazuli Bunting, 1; Song Sparrow, 1. **Total:** 25 species; 114 territorial males ( $391/\text{km}^2$ , 158/100 acres). **Remarks:** Territorial males increased 6% over last year. Six species (Am. Kestrel, Great Horned Owl, W. Wood Pewee, Black-headed Grosbeak, Lazuli Bunting, Song Sparrow) were new this year, with 1 territorial male for each. Increased car and truck traffic on the canal road bordering the plot, and the clearing of three  $2 \text{ m}^2$  areas of vegetation (mostly weeds) along the edge of the road for placement of benches and trash barrels caused minimal effect. The park remained closed to the public throughout the spring and summer.— *ROBERT ANDREWS*, 1390 S. Ivy Way, Denver, Colo. 80224.

**118. CALIFORNIA - BAY - BISHOP PINE - MIXED FOREST.** — **Location:** California; Marin Co., 0.5 mi. S of Inverness;  $38^\circ 0' \text{N}$ ,  $122^\circ 50' \text{W}$ , Inverness Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 11.7 ha = 29 acres (approximately rectangular, 900 x 1500 ft, measured). **Description of Plot:** See *AB* 26:981 (1972). **Weather:** The winter of 1975-76 was very dry. At P.R.B.O. headquarters approximately 11 mi. S only 17.6 in. of rain was recorded compared to a 9-year average of 37.3 in. On census days it was 100% clear with little or no wind. **Coverage:** March 24; April 21; May 7, 25; June 5, 17; 0530-1130 hours. Total man-hours: 20.5. **Census:** Wilson's Warbler, 7.5 (64, 26); Chestnut-backed Chickadee, 7 (60, 24); Rufous-sided Towhee, 7; Purple Finch, 6.5 (55, 22); W. Flycatcher, 5.5

(47, 19); Brown Creeper, 5.5; Pine Siskin, 5 (43, 17) Com. Bushtit, 3 (26, 10); Swainson's Thrush, 3; Dark eyed Junco, 3; Hutton's Vireo, 2.5; Wrentit, 2; Orange crowned Warbler, 2; Song Sparrow, 2; Acorn Woodpecker, 1; Hairy Woodpecker, 1; Steller's Jay, 1; Pygmy Nuthatch, 1; Winter Wren, 1; Bewick's Wren, 1; Hermit Thrush, 1; Warbling Vireo, 1; Turkey Vulture, +, Mourning Dove, +; Allen's Hummingbird, +; Com Raven, +. **Total:** 26 species; 69.5 territorial males ( $592/\text{km}^2$ , 240/100 acres). **Remarks:** During 5 years there has been a yearly decline in breeding males. The largest decline occurred between 1972 and 1974, 393/100 acres to 276/100 acres. The following nests were found: Acorn Woodpecker (1), Chestnut-backed Chickadee (1), Brown Creeper (2), Pygmy Nuthatch (2), Bushtit (1), Wilson's Warbler, (1), Rufous-sided Towhee (1), Song Sparrow (1) Contribution No. 139, P.B.R.O. — *ROBERT M. STEWART*, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

**119. OPEN ASPEN GROVE - SCATTERED CONIFERS.** — **Location:** Colorado; Larimer Co., Rocky Mountain National Park, NE  $\frac{1}{4}$  Sec. 31, TSN, R73W,  $40^\circ 22' \text{N}$ ,  $105^\circ 37' \text{W}$ , Longs Peak Quadrangle ( $7\frac{1}{2}'$ ) USGS. **Continuity:** New. **Size:** 14.0 ha = 34.6 acres (basically rectangular, surveyed with tape and Brunton compass; rechecked with an electronic digital planimeter). **Description of Plot:** Open aspen groves and meadows lie in a shallow, linear valley on the N side of a large glacial valley (Moraine Park), which is bordered on the N by a lateral moraine. Over-browsing by deer is reflected in the tree diameter statistics which show vir-



Census 119. Looking S towards Long's Peak. Study plot in foreground. Photo/Paula Hansley.

tually no aspen saplings; nearly all aspen seedlings have been nipped. If the over-browsing continues, these aspen stands — rather than being succeeded by spruce and fir — will gradually die out. The Quaking Aspen (*Populus tremuloides*) is, by far, the dominant tree; however, fully  $\frac{1}{3}$  (31.4%) are dead. Live aspen dbh's based on 24 hundredth-acre transects (353 trees) are, as follows: 0-9 cm, 1.2%; 10-19 cm, 42.6%; 20-29 cm, 52.9%; 30-39 cm, 3.3%. Dead aspen dbh's are: 0-9 cm, 5.4%; 10-19 cm, 73.9%; 20-29 cm, 20.7%. Canopy height averages 12 m, range 10-15 m. Other trees, predominantly conifers, are scattered sparsely throughout. Ponderosa Pine (*Pinus ponderosa*) dbh's are: 0-9 cm, 0%; 10-19 cm, 11.5%; 20-29 cm, 11.5%; 30-39 cm, 7.7%; 40-49 cm, 7.7%; 50-59 cm, 15.4%; 60-69 cm, 26.9%; 70-79 cm, 21.7%. Douglas-fir (*Pseudotsuga menziesii*): 0-9 cm, 13.0%; 10-19 cm, 30.4%; 20-29 cm, 30.4%; 30-39 cm, 17.4%; 40-59 cm, 0%; 60-69 cm, 4.3%. Minor trees include Lodgepole Pine (*P. contorta*), Limber Pine (*P. flexilis*), Engelmann Spruce (*Picea engelmanni*), Rocky Mountain Juniper (*Juniperus scopulorum*), Mountain Alder (*Alnus tenuifolia*), and Rocky Mountain Maple (*Acer glabrum*). A very few conifer saplings are scattered throughout the area, perhaps owing to lack of shade from the thinning aspen groves. The understory is complex, reflecting the variability of soil conditions from marshy under the aspens to well-drained on the rocky slopes. Dead trees litter the ground creating their own micro-environment and making walking difficult. Shrubs include, in order of abundance: Shrubby Cinquefoil (*Pentaphylloides floribunda*), Com. Juniper (*J. communis*), Squaw Current (*Ribes cereum*), various sages (*Artemisia tridentata*, *A. ludoviciana*, *A. frigida*, *A. dracunculus*), Antelope Bitterbrush (*Purshia tridentata*), Wild Rose (*Rosa woodsii*), Thimbleberry (*Rubus parviflorus*), Waxflower (*Jamiesia americana*), Rabbitbrush (*Chrysothamnus nauseosus*), and Golden Current (*R. aureum*). **Elevation:** 8300-8400 ft **Edge and Topography:** The valley slopes gently E. Bordered on the N by a morainal ridge covered with an open Ponderosa Pine forest. Bedrock ridges with open conifer stands lie to the S, and aspen groves continue down the valley to the E. **Weather:** Clear and dry. Temperature variable from 25° to 75°F. During the week of June 12, a hard freeze and snow down to 7500 ft caused many aspen leaves to turn black; associated wind blew down many trees including some live nest trees. **Coverage:** May 23, 29, 31; June 6, 13, 19, 29; July 3; 0545-1000 hours. Total man-hours: 23. **Census:** House Wren, 9 (64, 26); Tree Swallow, 8 (57, 23); Warbling Vireo, 5 (36, 14); Am. Robin, 4 (29, 12); Mountain Bluebird, 4; Williamson's Sapsucker, 3.5 (25, 10); Pygmy Nuthatch, 3.5; Com. Flicker, 3 (21, 9); Dusky Flycatcher, 3; W. Wood Pewee, 3; Mountain Chickadee, 3; Pine Siskin, 3; Gray-headed Junco, 3; Chipping Sparrow, 3; Broad-tailed Hummingbird 2; Goshawk, 1; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Townsend's Solitaire, 1; Ruby-crowned Kinglet, 1; Yellow-rumped Warbler, 1; Brown-headed Cowbird, 1; W. Tanager, 1; Evening Grosbeak, 1; Cassin's Finch, 1; Lincoln's Sparrow, 1; Brown Creeper, 0.5; Solitary Vireo, 0.5; Red-tailed Hawk, +; Great Horned Owl, +; Long-eared Owl, +; W. Flycatcher, +; Olive-sided Flycatcher, +; Red-breasted Nuthatch, +; Am. Goldfinch, +. **Total:** 37 species; 74 territorial males or females (528/km<sup>2</sup>,

214/100 acres). **Remarks:** Nests located: Tree Swallow, 8; House Wren, 5; Williamson's Sapsucker, 3; Mountain Chickadee, 3; Pygmy Nuthatch, 3; White-breasted Nuthatch, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Yellow-bellied Sapsucker, 1; Dusky Flycatcher, 1; Am. Robin, 1; Warbling Vireo, 1. This was the driest season in five years (winter snowpack was 60% of normal); areas within the plot that previously had been marshy were completely dry. Despite this, populations were normal. The Yellow-bellied Sapsucker nested for the first time. Thanks to Rocky Mountain National Park for permission to do the study and to David Buckner, Allen Crockett, and Louise Hering for their assistance — **PAULA L. HANSLEY**, 730 Concord, Apt. C, Boulder, Colo. 80302.

**120. PONDEROSA PINE - SCRUB OAK - MOUNTAIN MAHOGANY WOODLAND.** — **Location:** Colorado; Douglas Co., One mi. E of Franktown, on Hwy 86; 39°20'N, 104°40'W, Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 9 consecutive years. **Size:** 8.09 ha = 20 acres (surveyed; a trapezium, 453.7 ft on the N, 607.36 ft on the S along Hwy. 86, 1906.4 ft on the E, 1649.9 ft on the W). **Weather:** An extremely dry spring. **Coverage:** June 1, 11, 19, 28; July 6, 10, 19, 27; August 4, 12, 20; 0800-2030 hours. Total man-hours: 44. **Census:** W. Bluebird, 13 (161, 65); W. Wood Pewee, 2; House Wren, 2; Mourning Dove, 1; White-breasted Nuthatch, 1; Black-headed Grosbeak, 1. **Total:** 6 species; 20 territorial males (247/km<sup>2</sup>, 100/100 acres). **Visitors:** Turkey Vulture (overhead), Cooper's Hawk, Broad-tailed Hummingbird, Rufous Hummingbird, Com. (Red-shafted) Flicker, Hairy Woodpecker, Downy Woodpecker, Steller's Jay, Scrub Jay, Com. Crow, Black-capped Chickadee, Mountain Chickadee, Pygmy Nuthatch, Am. Robin, Solitary Vireo, Virginia's Warbler, Brown-headed Cowbird, W. Tanager, House Finch, Lesser Goldfinch, Rufous-sided Towhee, Lark Sparrow, Chipping Sparrow. **Remarks:** Four of these species brought young to water and feed but I could not determine if they had territories on or off the plot: Hairy Woodpecker, Downy Woodpecker, Black-headed Grosbeak, Rufous-sided Towhee. There were 13 nests in boxes. Other nests found: Mourning Dove, 1; W. Wood Pewee, 2; Black-headed Grosbeak, 1. — **MILDRED O. SNYDER**, 161 Del Mar Circle, Aurora, Colo. 80011.

**121. LOGGED DOUGLAS-FIR-RESEEDED WITH MONTEREY PINE.** — **Location:** California; Marin Co., 4.5 mi. S of Olema, approximately 0.5 mi. E of east gate to Lake Ranch, Point Reyes National Seashore; 37°58'N, 122°45'W, Double Point Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 8.17 ha = 20.2 acres (irregular, approximately 1200 x 700 ft, measured). **Description of Plot:** See AB 26:983-984 (1972). **Weather:** Generally clear and warm (70-80°F). Strong winds (Beaufort 6) on April 15 felled two Monterey Pines (*Pinus radiata*) and many branches. The winter and spring were exceedingly dry. Conditions of drought continued through the nesting season. **Coverage:** April 19, 27; May 4, 12, 20, 30; June 6, 14; 0700-1100 hours. Total

man-hours: 24. **Census:** Wrentit, 13 (159, 64); Orange-crowned Warbler, 11 (135, 54); Wilson's Warbler, 8.5 (104, 42); Rufous-sided Towhee, 8 (98, 40); Bewick's Wren, 7 (86, 35); Swainson's Thrush, 6 (73, 30); Song Sparrow, 5 (61, 25); Chestnut-backed Chickadee, 4 (49, 20); Pygmy Nuthatch, 4; Hutton's Vireo, 3.5 (43, 17); California Quail, 3 (37, 15); Violet-green Swallow, 2; Com. Bushtit, 2; Purple Finch, 2; Steller's Jay, 1.5; Starling, 1.5; Mourning Dove, 1; Allen's Hummingbird, 1; Hairy Woodpecker, 1; W. Flycatcher, 1; Pine Siskin, 1; Brown Towhee, 1; Acorn Woodpecker, 0.5; Red-tailed Hawk, +; Band-tailed Pigeon, +; Great Horned Owl, +; Com. Flicker, +; Olive-sided Flycatcher, +; Purple Martin, +; Scrub Jay, +; Dark-eyed Junco, +. **Total:** 31 species; 88.5 territorial males ( $1083/\text{km}^2$ , 438/100 acres). **Remarks:** Nests found: Allen's Hummingbird, 1; Violet-green Swallow, 2; Steller's Jay, 1; Chestnut-backed Chickadee, 1; Pygmy Nuthatch, 4; Bewick's Wren, 1; Starling, 1. The number of breeding Allen's Hummingbirds is undoubtedly higher than the figures indicate. Western Bluebirds, former breeders, were seen visiting possible nesting sites. These cavities were later occupied by Starlings and Violet-green Swallows. A plant transect done this year revealed vital regeneration of Douglas-fir (*Pseudotsuga menziesii*). No seedlings or saplings of Monterey Pine were found. Contribution No. 140. P.R.B.O. — *JULES EVENS, Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

**122. PONDEROSA PINE FOREST.** — **Location:** Colorado; Boulder Co., in the lower foothills 0.5 mi. S of Baseline Rd, Boulder, in the E part of Sect. 1, T1S, R71W, 6th Principal Meridian; 39°59'N, 105°17'W, Eldorado Springs Quadrangle, USGS. **Continuity:** Established 1954; 13 intermittent years. **Size:** 8.09 ha = 20 acres (rectangular, surveyed). **Description of Plot:** See AFN 8:372 (1954). **Weather:** A very dry, hot spring and summer. **Coverage:** March 28; April 4, 11, 25; May 2, 9, 23, 30; June 6, 13, 20, 27; July 4, 11, 18; August 8; 0700-0945 hours. Total man-hours: 25. **Census:** W. Wood Pewee, 9 (111, 45); Chipping Sparrow, 9; Mourning Dove, 6 (74, 30); Am. Robin, 6; Pygmy Nuthatch, 5 (62, 25); Solitary Vireo, 4 (49, 20); Mountain Chickadee, 3 (37, 15); Gray-headed Junco, 3; Broad-tailed Hummingbird, 2; White-breasted Nuthatch, 2; W. Tanager, 2; Com. Flicker, 1; Steller's Jay, 1. **Total:** 13 species; 53 territorial males or females ( $655/\text{km}^2$ , 265/100 acres). **Remarks:** The population was about average for recent years. House Wren, Black-headed Grosbeak, Pine Siskin, and Lesser Goldfinch did not nest. — *LOUISE HERING and KAREN NICKEY, 568 Marine Street, Boulder, Colo. 80302.*

**123. MIXED HABITAT: DREDGED MATERIAL ISLANDS.** — **Location:** Oregon; Clatsop Co., Lewis and Clark N.W.R., Mott Island, on the Columbia River, 0.5 mi E of Tongue Point; 46°12'N, 123°45'W, Svenson Quadrangle, USGS. **Continuity:** New (1975). **Size:** 12.1 ha = 29.8 acres (rectangular, 1300 x 1000 ft, oriented N26°E (true), paced with compass). **Description of Plot:** Located on a 147-acre island entirely created by dredged material. Initial disposal took place between 1946 and 1948. Shore Pine (*Pinus contorta*), Scotch Broom (*Cytisus scoparius*), and Beachgrass (*Ammophila arenaria*)

were planted in 1948 for substrate stabilization. The island was again used as a disposal area in 1952. Slurry was deposited in the center portion of the island behind a dike. The 1952 disposal destroyed much of the 1948 plantings, especially those of Scotch Broom and Beachgrass. Following the 1952 disposal, Beachgrass was again planted. Since 1952 Shore Pine has been gradually dying out while Scotch Broom has been rapidly spreading and overtopping Beachgrass. Additional plant species have been invading. Six plant associations are now present on the island and, except for Shore Pine, are arranged in a concentric pattern. A marsh inundated by tides occurs on the periphery followed by Red Alder (*Alnus rubra*)-Pacific Willow (*Salix lasiandra*), Red Alder-Black Cottonwood (*Populus trichocarpa*), Scotch Broom-Hairgrass (*Aira praecox*), and Beachgrass-Hairgrass associations. Shore Pine occurs as a narrow linear stand among the Red Alder-Black Cottonwood association on the W side of the island. All but the tidal marsh are represented on the plot. A quantitative survey of vegetation was performed on the island in July 1974 using a random quadrat method for shrubs and herbaceous plants and the Bitterlich method for trees. Results of the survey follow. The Red Alder-Pacific Willow association comprises 4.1% (1.2 acres). Ash (*Fraxinus latifolia*) and saplings of Red Alder and Pacific Willow are common understory components. A true shrub canopy is not present. Important herbs are Jewelweed (*Impatiens* sp.), Canary-grass (*Phalaris arundinacea*), Scouring Rush (*Equisetum telmateia*), Creeping Charlie (*Glecoma hederacea*), and bryophytes. The association is inundated during high tides and the ground is heavily littered with floatable debris such as logs, bottles, and styrofoam. The tree canopy has a density of 97.8 stems/acre and a total basal area of 18.1  $\text{ft}^2/\text{acre}$ . Species composing 100% of the tree canopy [figures after each give relative density (%) and relative basal area (%)] in that sequence]: Red Alder, 53.6, 74.4; Pacific Willow, 46.4, 25.6. Percentage of trees by diameter class: A (3-6 in.), 71.1; B (6-9 in.), 10.5; C (9-15 in.), 15.8; D (15-21 in.), 2.6. Ground cover 90.5%; canopy cover 10%, average canopy height 25 ft. The Red Alder-Black Cottonwood association comprises 42.6% (12.7 acres) of the plot. Major understory components are West Coast Willow (*Salix hookeriana*) and saplings of Red Alder and Black Cottonwood. Principal shrubs are Elderberry (*Sambucus racemosa*), Salmonberry (*Rubus spectabilis*), and Evergreen Blackberry (*R. laciniatus*). Herbs occur primarily beneath openings in the tree canopy. Important species are Jewelweed, Velvetgrass (*Holcus lanatus*), Sedge (*Carex obnupta*), Bluegrass (*Poa* sp.), Scouring Rush (*E. hyemale*), and bryophytes. The tree canopy has a density of 283.5 stems/acre and a total basal area of 93.6  $\text{ft}^2/\text{acre}$ . Species composing 94% of the tree canopy: Red Alder, 79.6, 76.3; Black Cottonwood, 14.1, 20.9. Percentage of trees by diameter class: A, 16.4; B, 28.4; C, 39.7; D, 13.8; E, (21-27 in.), 1.7. Shrub stems/acre: 2228; ground cover 62%; canopy cover 65%; average canopy height 55 ft. The Shore Pine stand covers 4.4% (1.3 acres). The understory consists of scattered Black Cottonwood and Red Alder saplings. Scotch Broom and West Coast Willow are the principal shrubs present. The Scotch Broom is of poor vigor and is probably unable to tolerate shading by Shore Pine. Important herbaceous plants are Canarygrass, Bentgrass (*Agrostis exarata*), Sedge, Scouring Rushes (*E. telmateia*)

and *E. hyemale*), and bryophytes. The tree canopy has a density of 199 stems/acre and a total basal area of 91.9 ft<sup>2</sup>/acre. Species composing 97% of the tree canopy: Shore Pine, 91.4, 81.5; Black Cottonwood, 5.5, 15.6. Percentage of trees by diameter class: A, 10.5; B, 43; C, 43, D, 1.2; E, 2. Shrub stems/acre: 1012.5; ground cover 82.2%, canopy cover 45%; average canopy height 40 ft. The Scotch Broom-Hairgrass association covers 10.7% (3.2 acres) of the plot. Scotch Broom is the only shrub present and has density of 11,643.8 stems/acre. The shrub canopy averages 6 ft in height. Prominent herbs are Hairgrass (13.5% cover), Fescue (*Festuca bromoides* 10.5%), Velvetgrass (9.5%), and Tansy Ragwort (*Senecio jacobaea* 9%). The Beachgrass-Hairgrass association occupies 9.4% (2.8 acres) of the study plot. Other important herbs include a second species of Hairgrass, (*A. elegans*), and Velvetgrass. Percentage cover by each is: Beachgrass, 31.6; Hairgrass (*A. praecox*), 22.6; Hairgrass (*A. elegans*), 6; Velvetgrass, 5. Clumps of Scotch Broom are widely scattered throughout this association indicating that this species is gradually invading. A small ephemeral pond is located near the E boundary. **Edge:** Bordered on the W and E by tidal marsh; on the N and S by similar habitats. **Topography:** Gently rising from the outer island periphery towards the island center except between the Red Alder-Black Cottonwood and the Scotch Broom-Hairgrass associations on the W side of the island where the remains of an 8 ft dike occur. **Elevation:** 23 to 33 ft above mean low water. **Weather:** Overcast and misty on 2 days; clear on all others. Morning temperatures ranged from the low 50s to the low 60s F. Winds were calm. **Coverage, 1975:** June 6-10; between 0500-0930 and 2055-2155 hours. Total man-hours: 27. **Census:** Swainson's Thrush 13 (108, 44); Song Sparrow, 10 (83, 34); Yellow Warbler, 9 (75, 30); White-crowned Sparrow, 8 (66, 27); Black-headed Grosbeak, 7 (58, 23); W Flycatcher, 6.5 (54, 22); Bewick's Wren, 5 (41, 17); Am Robin, 4 (33, 13); Willow Flycatcher, 2.5; Ring-necked Pheasant, 2; Com. Crow, 2; Rufous Hummingbird (female), 1; Downy Woodpecker, 1; Brown-headed Cowbird (female), 1; Mallard, +; Pygmy Owl, +; Com. Flicker, +. **Total:** 17 species; 72 territorial males or females (597/km<sup>2</sup>, 242/100 acres). **Remarks:** Mott Island supports a large Com. Crow nesting and roosting colony. A total of 26 Com. Crow nests were found; only 2 of the 26 nests were still active on June 6. Other nests found: Mallard, 1; Downy Woodpecker, 1; W. Flycatcher, 1; Song Sparrow, 1. Starlings, Black-capped and Chestnut-backed Chickadees had hatched young and were foraging in family groups. A male Am. Goldfinch was heard singing on the last census day indicating that this late-breeding species was just beginning to establish territories. This census was performed in an effort to gather baseline data for description of plant and animal succession patterns on U.S. Army, Corps of Engineers (COE) dredged material disposal sites. The study was supported by the COE, Waterways Experiment Station, Vicksburg, MS under grant number DACW 39-74-C-0092. — **STEPHEN B. ATKINS, RONALD G. PSCION, and DAVID M. DuMOND, Coastal Zone Resources Corp., Wilmington, N.C. 28401.**

#### 124. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — Location: Oregon; Grant Co., Bates, 1/4 mi. E

of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973, 4 consecutive years. **Size:** 32.38 ha = 80 acres (rectangle, laid out in 2.5 acre squares with compass and measured rope). **Description of Plot:** See AB 27:102-1003 (1973) **Weather:** Temperatures 28°-64°F; clear on 11 censuses and partly cloudy to cloudy on 7. Rain amounted to 4.26 in. during census period though most of this occurred between Aug. 1 and Aug. 17 while nesting was still underway. Winter and spring precipitation was generally normal in contrast to the preceding 2 years of above normal amounts. **Coverage:** June 22, 24, 26, 28-29; July 1-3, 5, 7, 9-10, 13, 15, 17, 21, 23, 27; 0440-0838 hrs., PDST Total man-hours: 42. **Census:** Chipping Sparrow, 13 (40, 16); White-crowned Sparrow, 13; Cassin's Finch, 8 (25, 10); Am. Robin, 7 (22, 9); Fox Sparrow, 6 (19, 8); Yellow-rumped Warbler, 5.5 (17, 7); Mountain Bluebird, 5 (15, 6); Ruby-crowned Kinglet, 4.5 (14, 6); Lincoln's Sparrow, 4 (12, 5); Spotted Sandpiper, 1; Com. Flicker, 1; Olive-sided Flycatcher, 1; Mountain Chickadee, 1; Red-breasted Nuthatch, 1; Varied Thrush, 1; Dark-eyed Junco, 1; Hairy Woodpecker, 0.5; Steller's Jay, 0.5 **Total:** 18 species; 74 territorial males (229/km<sup>2</sup>, 93/100 acres). **Visitors:** Williamson's Sapsucker, Clark's Nutcracker, Pine Siskin, Red Crossbill. **Remarks:** Nests located: Com. Flicker, 1; Mountain Chickadee, 1; Mountain Bluebird, 3; Chipping Sparrow, 1; Lincoln's Sparrow, 1. Numbers of species were up 18 compared to 16 last year, with 2 species (Red-breasted Nuthatch and Dark-eyed Junco) being new. Breeding activity was close to the level recorded in 1975 with a notable doubling from 4 to 8 breeding pairs of Cassin's Finches, while Fox Sparrows and Mountain Bluebirds were each up 2 pairs. Mountain Chickadees were showing a continual slow decline from a high of 4 in 1973 to one pair this year. Robins were up 3 pairs over last year's 4, while Ruby-crowned Kinglets rose from 1 pair in 1975 to 4.5, still only half as many as the 9 pairs recorded in 1974. We are grateful to the Staff of the Malheur National Forest for their cooperation and assistance. — **MERLE A ARCHIE, and ROBERT A. HUDSON, P.O. Box 81, Bates, Ore. 97817.**

#### 125. CATCLAW-RABBITBRUSH DESERT WASH.

— **Location:** California; San Bernardino Co., Piute Wash in Piute Valley; the plot begins in the NE 1/4 of Sec 8 and ends in the NW 1/4 of Sec. 5, T11N, R20E; 35°04'N, 114°50'W, Homer Mtn. Quadrangle, USGS. About 8 mi N of Arrowhead Junction on U.S. Hwy. 95 NW of Needles, a powerline road crosses the highway and intersects Piute Wash 0.2 mi. to the W. The plot begins N of the powerline, and follows the wash 1.5 mi. N; the N boundary is 8.25 mi. E and 3.3 mi. S of the Fort Piute Ruins. **Continuity:** New. **Size:** 17.8 ha = 44.0 acres (rectangular, 2375 x 75 m, paced). **Description of Plot:** See AB 30:1060 (1976). **Elevation:** 1900 ft. **Coverage:** April 7-8, 24, 29, May 5, 8-9, 13; 0515-0930. Total party-hours: 17. **Census:** Phainopepla, 16 (90, 36); Mourning Dove, 15 (84, 34); Verdin, 6 (34, 14); Mockingbird, 4 (22, 9); Black-tailed Gnatcatcher, 2; House Finch, 2; Black-throated Sparrow, 2; Ash-throated Flycatcher, 1; Turkey Vulture, +; Gambel's Quail, +; Roadrunner, +; Le Conte's Thrasher, +. **Total:** 12 species; 49 territorial males (275/km<sup>2</sup>, 111/100 acres). **Remarks:** Brown-headed

Cowbirds may have "nested", since 2-3 were seen on each of the last four censuses. Mourning Dove density varied greatly, owing to presence of visitors as well as birds thought to be nesting, and our density figure for this species may be inaccurate, relative to those for other, more territorial species. Nests found: Verdin (3), Phainopepla (1), House Finch (1). Phainopeplas abandon the plot entirely after the spring breeding season. Breeding bird density in this wash is more than 12 times as great as the surrounding creosote-burrobush scrub, and 6 times as many species breed in the wash as in the surrounding desert (see Census 128). If visitors, which are an important part of the wash avifauna during migration but virtually non-existent on the creosote-burrobush plot, are included in the analysis, the wash has 23 times the density and 12 times the number of species as the open desert. — M. ROBERT KUBIK, JR., and J. V. REMSEN, JR., California Desert Plan Program, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.

**126. CITY PARK.** — **Location:** California; Los Angeles Co., Long Beach, on the SE corner of the intersection of Carson St. and Clark Ave. **Continuity:** New. **Size:** 6.68 ha = 16.5 acres (rectangular, 200 x 400 yards, paced). **Description of Plot:** Typical city park with manicured lawns. Three non-botanic features are found: 28 x 14 ft restroom, 32 x 70 ft tool shed, 32 ft wide concrete flood control channel which crosses the plot diagonally. The dominant canopy trees are Canary Island Pine (*Pinus canariensis*), Aleppo Pine (*P. halepensis*) and Chinese Evergreen Elm (*Ulmus parvifolia*). The understory consists only of a few Sycamores (*Platanus* sp.) under 3 inches in diameter. The ground cover is entirely of grasses, kept closely mowed. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on an actual count, 40/acre; total basal area, based on ten circular samples, 13.9 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Canary Island Pine, 12, 29, 31, 90; Aleppo Pine, 5, 12, 22, 40; Chinese Evergreen Elm, 5, 12, 38, 60; *Eucalyptus* sp., 4, 9, 34, 20; *Jacaranda acutifolia*, 3, 9, 8, 40, sycamore, 3, 7, 6, 70; Honey Locust (*Gleditsia triacanthus*), 3, 7, 10, 30; Silk Tree (*Albizia julibrissin*), 2, 5, 4, 10; Carob (*Ceratonia siliqua*), 1, 2, 1, 10. Trees by diameter size class: A (3-6 in.) 11, 28, 9, 100; B (6-9 in.) 17, 42, 36, 100; C (9-15 in.) 8, 20, 41, 60; D (15-21 in.) 2, 5, 24, 30; E (21-27 in.) 1, 2.5, 21, 20; F (27-33 in.) 1, 2.5, 21, 10. Shrub stems/acre, none; ground cover 99%; canopy 12%; average canopy height 31 ft (range 9-69). **Edge:** Bordered on three sides by paved road and on the fourth by the remainder of the park. **Topography:** Mostly flat. **Elevation:** 35 ft. **Weather:** Partly cloudy in the early mornings, usually clearing by mid-morning with mild temperatures. **Coverage:** April 30; May 2-3, 7, 9-10, 14, 17, 23; dawn-1030 hours. Total man-hours: 36. **Census:** House Sparrow, 9 (135, 55); House Finch, 7 (105, 42); Brown-headed Cowbird, 5 females (75, 30); Mourning Dove, 4 (60, 24); Starling, 1; Brewer's Blackbird, 1. **Total:** 6 species; 27 territorial males or females (404/km<sup>2</sup>, 164/100 acres). **Remarks:** Although a large number of Brown-headed Cowbirds was seen, no nest parasitism was noted. Nests located: House Sparrow, 2; House Finch, 1. Although there was a large number of

birds using this plot there was not much nesting activity. Human disturbance is probably why few trees in the interior of the plot are utilized. Thanks to Long Beach Parks Department and Bill Montgomery for assistance with the quantitative habitat description — REVIS JOHNSTON, Dept. Biol., Cal. St. U., Long Beach, and 4555 Goldfield Ave., Long Beach, Calif. 90807.

**127. COASTAL SAND DUNES.** — **Location:** California; Humboldt Co., on Samoa Peninsula, 4 mi S of intersection of State Hwy. 255 and Samoa Blvd.; 40°6'N, 124°12'W, Eureka Quadrangle, USGS. **Continuity:** New. **Size:** 15.0 ha = 37 acres (rectangle, about 1100 x 1500 ft, measured with dot grid overlay from aerial photo). **Description of Plot:** Beach Lupine (*Lupinus arboreus*), the dominant shrub cover, was introduced in about 1900 from Bodega Bay and has largely stabilized the original shifting sand dunes. Other major ground cover shrubs include: Wild Buckwheat (*Eriogonum latifolium*), Sagebrush (*Artemisia pycnocephala*), Knotweed (*Polygonum paronychia*), Goldenrod (*Solidago spathulata*), and Tansy (*Tanacetum douglasii*). An endangered species, Coastal Wallflower (*Erysimum menziesii*), is also present. Valleys between sand dunes are dominated by Sedge (*Carex obnupta*), Rush (*Juncus lesueurii*), and California Blackberry (*Rubus vitifolius*). Three clumps of Willow (*Salix hookeriana*, *S. piperi*, *S. sitchensis*) are present. A road, parking lot, softball diamond, and fence exist on the plot. Ground cover is about 35% lupine, 35% other shrubs, and 30% sand. **Edge:** Humboldt Bay is the E border and similar sand dunes surround the other boundaries. **Topography:** Undulating dunes. **Elevation:** Sea level to about 30 ft. **Weather:** Mild maritime climate. **Coverage:** May 26, 30; June 4, 12-13, 21, 23, 27, 0600-1100 hours. Total man-hours: 24. **Census:** Song Sparrow, 34.5 (230, 93); White-crowned Sparrow, 12.5 (83, 34); Bewick's Wren, 5.5 (37, 15); Am. Robin, 3 (20, 8); Brown-headed Cowbird, 3 (females); Allen's Hummingbird, 2; Long-billed Marsh Wren, 1.5; Swainson's Thrush, 1; W. Meadowlark, 1. **Total:** 9 species; 64 territorial males or females (427/km<sup>2</sup>, 173/100 acres) **Visitors:** California Quail, Mourning Dove, Com Flicker, Com. Bushtit, Starling, Orange-crowned Warbler, Yellow Warbler, Wilson's Warbler, Brewer's Blackbird, Purple Finch, House Finch, Am. Goldfinch, Lesser Goldfinch. **Remarks:** Most birds established territories in brush-dominated areas. Few territories existed in open sandy areas with little cover. Numerous Brown-headed Cowbird young were observed in association with adults and young of Song and White-crowned Sparrows. American and Lesser Goldfinches probably nested after censusing was completed. Special thanks to Tom Overturf for help in identifying willows and Dave Milbrat for help in marking the plot. — PETER C. SORENSEN and PAUL F. SPRINGER, U.S. Fish and Wildlife Service, Humboldt State Univ., Arcata, Calif. 95521.

**128. CREOSOTE-BURROBUSH DESERT SCRUB.** — **Location:** California; San Bernardino Co., Piute Valley, about 8 mi. N of Arrowhead Junction on U S Hwy. 95, NW of Needles; a powerline road crosses the

highway; the study plot began 100 m N of the second power pole E of the highway and proceeds N 1.5 mi. The N boundary is 8.75 mi. E and 2.5 mi. S of the Fort Piute ruins. The plot begins in the SW  $\frac{1}{4}$  of Sec. 4, T11N, R20E, and ends in the NE  $\frac{1}{4}$  of Sec. 33, T12N, R20E of the Homer Mtn. Quadrangle, USGS; 35°0'4"N, 114°49'W. **Continuity:** New. **Size:** 17.8 ha = 44.0 acres (rectangular, 2375 x 75 m, paced). **Description of Plot:** A typical creosote scrub area of the Mojave Desert. Three 100 toe-point transects were conducted to determine percent cover and species composition. The substratum was composed of 64% bare ground, 21% small rocks (<5 cm), and 15% plant litter. The shrub canopy cover of 22% is composed of 40.6% Creosote Bush (*Larrea tridentata*), 32.8% Burrobush (*Ambrosia dumosa*), 21.9% dead shrubs (almost all Burrobush), and 4.7% Krameria (*Krameria parviflora*). Shrub composition is 52% Burrobush, 26% dead shrubs (99% of which are Burrobush), 20% Creosote Bush, and 2% Krameria. Other species not recorded in the transects were Big Galleta Grass (*Hilaria rigida*), Desert-alyssum (*Lepidium fremontii*), Bladder-sage (*Salazaria mexicana*), and Goldenhead (*Acamptopappus sphaerocephalus*) along a small wash; and a few small individuals of Silver Cholla (*Opuntia echinocarpa*). The absence of tracks or feces of either cattle or feral burros plus the presence of full height Big Galleta Grass indicates this plot has not been grazed recently. **Topography:** Slightly sloping; nearest mountain slopes are 3 mi. to the E on the Dead Mountains; a very small wash traverses the plot. **Elevation:** 1960-2120 ft. **Water:** The nearest permanent water is at Piute Spring, about 10 mi. W. There are two California Department of Fish and Game "guzzlers" (B-230 and B-229) in the Dead Mountains, both about 3.5 mi. from the plot, which may provide permanent water. **Edge:** Bounded on all sides by similar habitat. **Coverage:** April 7, 23-24, 29; May 4, 8-9, 13, between 1600 and 1815. Total party-hours: 11. **Census:** Black-throated Sparrow, 3 (17, 7); Loggerhead Shrike, +. **Total:** 2 species; 3 territorial males (17/km<sup>2</sup>, 7/100 acres). **Remarks:** Visitors (total number recorded on 8 censuses): Mourning Dove, 2. This plot is only one mi (E) from Census No. 125, and was designed for comparison with the wash. Density and species diversity are much richer in the wash than in the open desert. — *M. ROBERT KUBIK, JR., and J. V. REMSEN, JR., California Desert Plan Program, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.*

**129. DESERT RIPARIAN.** — **Location:** California; San Bernardino Co.; Fort Piute, 21.75 mi. W and 19.25 mi. N of the post office in Needles; from NW  $\frac{1}{4}$  of Sec. 24 to SE  $\frac{1}{4}$  of Sec. 13 of T12N, R18E, Homer Mtn. Quadrangle, USGS; 35°0'7"N, 114°59'W. **Continuity:** New. **Size:** 6.58 ha = 16.26 acres. **Description of Plot:** See AB 30 1063, (1976). **Weather:** Temperatures ranged from about 40° to 95°F. No appreciable precipitation was recorded. **Coverage:** April 9, 21-23, 30; May 6, 14, 19; 0530-0930. Total man-hours: 32. **Census:** Mourning Dove, 80 (1216, 492); House Finch, 18 (274, 111); Costa's Hummingbird (males), 13 (198, 80); Phainopepla, 12 (182, 74); Blue-gray Gnatcatcher, 8 (122, 49); Verdins, 4 (61, 25); Gambel's Quail, 3 (46, 18); Hooded Oriole, 2; Black-headed Grosbeak, 2; Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Black Phoebe, 1;

Red-tailed Hawk, +. **Total:** 13 species; 142 territorial males (2158/km<sup>2</sup>, 873/100 acres). **Remarks:** The following nests were found: Mourning Dove (3), Costa's Hummingbird (4), Phainopepla (3); Blue-gray Gnatcatcher (2), Hooded Oriole (1). Lesser Goldfinches may actually nest here, but no positive evidence of breeding could be found. Densities of Mourning Doves and House Finches may be inaccurate since it was very difficult to distinguish pairs actually breeding from birds roosting, visiting, feeding, or loafing in the riparian. As many as 900 Mourning Doves have been seen on a single morning. Four species for which the habitat seemed very suitable were inexplicably absent as breeding species: Black-chinned Hummingbirds, Bell's Vireo, Lucy's Warbler, and Yellow-breasted Chat. The plot was highly attractive to migrants. Poorwills call at night from the surrounding slopes and probably forage over the plot. — *J. V. REMSEN, JR., California Desert Plan Program, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.*

**130. URBAN NATURE CENTER.** — **Location:** California; Orange Co., Shipley Nature Center, corner of Golden West and Talbert Ave., Huntington Beach, 33°42'N, 118°00'W, Seal Beach Quadrangle, USGS. **New.** **Size:** 7.3 ha = 18 acres (broadly rectangular)

**Description of Plot:** A mixture of interdigitated habitat types, altered by human disturbance. The central 20% is an irregular thicket of Red Willow (*Salix laevigata*) to 40 or 50 ft and Arroyo Willow (*S. lasiolepis*) 10 to 20 ft, with associated small willows and brush, including Tamarisk (*Tamarix* sp.) and Tree Tobacco (*Nicotiana glauca*). Another 10% of the area is occupied by a small, permanent pond and its reed borders, which widen to a large patch at one end. Water level is maintained by occasional pumping. Most of the area around the thicket and the pond supports a heavy growth of mixed forbs, covering 20% of the tract. Another 20%, mostly near the perimeter, is covered by grass, and 25% by mixed grass and forbs. Recent plantings of eucalypts and conifers in the grassy areas are too small to be significant to bird life. About 5% is occupied by buildings, a garden, and a trail system. **Edge:** Bordered on the N and E by recently built housing tracts, on the W by a large, newly landscaped city park including a pond, and on the S by a city street. South of the street is another large park containing a shallow pond with meandering edges and natural marsh vegetation. **Topography:** Flat, with a rise of about 10 ft at the S end. **Elevation:** About 10 ft. **Weather:** Sunny to light overcast, daytime temperature 70° to 80°F, rare light rain. **Coverage:** May 10, 12-14, 19-20, 24, 27; 0900-noon. Total man-hours: 16. **Census:** Tricolored Blackbird, 40+ (549+, 222+); Song Sparrow, 22 (302, 122); Mourning Dove, 10 (137, 56); Anna's Hummingbird, 5 (69, 28); House Finch, 5; N. Oriole, 3 (41, 17); Am. Goldfinch, 3; Ring-necked Pheasant, 2; W. Meadowlark, 2; Brown-headed Cowbird, 2 (females); Am. Coot, 1; Dusky Flycatcher, 1; Mockingbird, 1; Loggerhead Shrike, 1; Warbling Vireo, 1; Wilson's Warbler, 1; Black-headed Grosbeak, 1; Grasshopper Sparrow, 1. **Total:** 19 species; 103 territorial males or females (1414/km<sup>2</sup>, 572/100 acres). **Visitors:** Pied-billed Grebe, Mallard, Ruddy Duck, Black-crowned Night Heron, Olive-sided Flycatcher, Barn Swallow, Cliff Swallow,

Com. Crow, Orange-crowned Warbler, Townsend's Warbler, House Sparrow, Red-winged Blackbird, Lesser Goldfinch, Fox Sparrow. **Remarks:** The Dusky Flycatcher, Warbling Vireo, and Wilson's Warbler are not expected breeding birds in this area and might better be considered visitors or migrants. However, they were seen regularly in the same places and were thus considered to be resident. Three nests were located: Mourning Dove (2), Song Sparrow (1). The House Finch population on the tract was much larger than indicated, but only 5 males were defending territories during the survey. The population of Tricolored Blackbirds was 40-60 pairs; an accurate count of nests would have required considerable trampling of the habitat. Part of the flock flew into the adjacent trees when alarmed, so a total aerial count was not possible. Red-winged Blackbirds nested in the park across the street, but they were only occasional visitors to this tract while the Tricolored Blackbirds were nesting. —*KRISTEN E. BENDER, Dept. Biol., Cal. St. U., Long Beach, and 21142 Shepherd Lane, Huntington Beach, Calif. 92646.*

**131. URBAN NATURE CENTER, I. — Location:** California; Los Angeles Co., El Dorado Nature Center, Long Beach, bounded on the N by Spring St., S by Willow St., E by a tree farm, W by San Gabriel River. **Continuity:** New, but Winter Bird Population Studies conducted since 1971. **Size:** 17.0 ha = 42 acres (rectangular, about  $\frac{1}{2}$  mi. N-S, 1/8 mi. E-W). **Description of Plot:** W half of the nature center, including area W of ponds in N and S of nature center. See AB 25:656, (1971). The dominant canopy trees are California Sycamore (*Platanus racemosa*), White Alder (*Alnus rhombifolia*), Elderberry (*Sambucus canadensis*). Most prominent in the understory are California Blackberry (*Rubus ursinus*), Silk Tassel (*Garrya fremontii*). The ground cover is mostly Foxtail Chess (*Bromus rubens*), Field Mustard (*Brassica rapa sylvestris*), and various dense grasses. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 88/acre; total basal area 47 ft<sup>2</sup>/acre. Species of trees include: California Sycamore, 22, 25, 13, 50, White Alder, 14, 16, 46, 50; Elderberry, 13, 15, 5, 33; Blue Gum (*Eucalyptus globulus*), 10, 11, 12, 17; Manna Gum Eucalyptus (*E. viminalis*), 10, 11, 9, 17; Dawn Redwood (*Metasequoia glyptostroboides*), 10, 11, 3, 17; Coast Live Oak (*Quercus agrifolia*), 5, 6, 1, 17; Coast Redwood (*Sequoia sempervirens*), 3, 3, 7, 17; *Viburnum* sp., 2, 2, 3, 17. Trees by diameter size class: A (3-6 in.) 43, 49, 4, 3, 9; B (6-9 in.) 21, 24, 6, 2, 13; C (9-15 in.) 21, 24, 26, 6, 57; E (21-27 in.) 3, 3, 9, 21. Shrub stems/acre 2250; ground cover 92%; canopy cover 40.3%; average canopy height 18 ft (range 11-47). **Edge:** Discontinuous on N, S, and W sides. Continuous with Part II (Census No. 132) on E. **Topography:** Essentially flat with one rise to 45 ft. **Elevation:** 28 ft. **Weather:** Morning low cloud cover all days. Average temperature 68°F (range 62-74°). **Coverage:** May 19-22, 24-29; between 0600-1030 hours. Total man-hours: 19. **Census:** Mourning Dove, 21 (124, 50), Mockingbird, 12 (71, 29); Starling, 6 (35, 14); Song Sparrow, 4 (24, 10); Am. Robin, 3 (18, 7); Loggerhead Shrike, 3; Lesser Goldfinch, 3; House Finch, 3; Am. Coot, 2; Black-chinned Hummingbird, 2; Hermit Thrush, 2; N. Oriole, 2; Ash-throated Flycatcher, 1;

*Empidonax* sp., 1; Cliff Swallow, 1; Red-winged Blackbird, 1; Am. Goldfinch, 1; Spotted Dove, +, Anna's Hummingbird, +. **Total:** 19 species; 68 territorial males (400/km<sup>2</sup>, 162/100 acres). **Remarks:** Twenty-one active nests were located: Mourning Dove, 9; Mockingbird, 4; Loggerhead Shrike, 3; Spotted Dove, 1, Am Robin, 1; N. (Bullock's) Oriole, 1; Lesser Goldfinch, 1, Song Sparrow, 1. Special thanks to Hal D. Boley — *JERRY T. HERRING, Dept. Biol., Cal. St. U., Long Beach and 918 Freeman St., Long Beach, Calif. 90804*

### 132. URBAN NATURE CENTER, II. — Location:

See Census 131. **Continuity:** New. **Size:** 17.4 ha = 43 acres (rectangular, about  $\frac{1}{2}$  mi. N-S, 1/8 mi. E-W) **Description of Plot:** See AB 25:656 (1971). For this study the nature center was divided into two areas, study plot II comprising the E half. This plot includes all the area E of the ponds in the N and S of the nature center. The dominant canopy trees are California Sycamore, Manna Gum and Canary Island Pine (*Pinus canariensis*). Most prominent in the understory are Bright-bead Cotoneaster (*Cotoneaster glaucophylla*), Toyon (*Heteromeles arbutifolia*), California Blackberry (*Rubus ursinus*) and Silk Tassel. The ground cover is primarily Foxtail Chess, Field Mustard and numerous dense grasses. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 120/acre; total basal area 29.8 ft<sup>2</sup>/acre. Species comprising the total number of trees California Sycamore, 27, 22, 15, 33; Manna Gum, 21, 17, 22, 17; Canary Island Pine, 19, 16, 10, 17; White Alder, 13, 10, 10, 33; Blue Gum, 11, 9, 6, 17; Red Iron Bark (*E sideroxylon*), 8, 7, 6, 17; Aleppo Pine (*P. halepensis*), 8, 17, 16, 17; Red Mulberry (*Morus rubra*), 5, 4, 4, 33, Elderberry, 5, 4, 1, 17; Weeping Willow (*Salix babylonica*), 2, 2, 9, 17; Pepper-tree (*Schinus molle*), 2, 2, 1, 17. Trees by diameter size class: A (3-6 in.) 62, 52, 6, 2, 21, B (6-9 in.) 46, 38, 13.0, 43; C (9-15 in.) 10, 8, 7.7, 26, D (15-21 in.) 2, 2, 2.9, 10. Shrub stems/acre 2000; ground cover 93%; canopy cover 43%; average canopy height 17 ft (range 10-44 ft). **Edge:** Discontinuous to N, S, E (see Location above), continuous with Part I to W. **Topography, Weather, Coverage:** See Urban Nature Center, I (Census No. 131). Total man-hours: 19. **Census:** Mourning Dove, 34 (195, 79); Mockingbird, 15 (86, 35), Starling, 14 (80, 33); Red-winged Blackbird, 5 (29, 12), Black-chinned Hummingbird, 3 (17, 7); House Finch, 3, Song Sparrow, 3; Barn Swallow, 2; Lesser Goldfinch, 2, W. Wood Pewee, 1; Hermit Thrush, 1; Loggerhead Shrike, 1; Hutton's Vireo, 1; N. Oriole, 1; Anna's Hummingbird, +; Am. Robin, +; Warbling Vireo, +. **Total:** 17 species; 86 territorial males (494/km<sup>2</sup>, 200/100 acres)

**Visitors:** Pied-billed Grebe, Mallard (res.), Cinnamon Teal, Ruddy Duck, Am. Coot (res.), Com. Gallinule, Ash-throated Flycatcher, *Empidonax* sp., Cliff Swallow, Wilson's Warbler, Brown-headed Cowbird, Black-headed Grosbeak. **Remarks:** Seven active nests were located: Mourning Dove (3), Barn Swallow (1), Mockingbird (1), Red-winged Blackbird (1), N. Oriole (1) Three fledglings just out of their nests were seen Red-winged Blackbird, 1; Song Sparrow, 2. Special thanks to Hal Boley. — *DENNIS FEES, Dept. Biol., Cal. St. U., Long Beach, and 6790 Curtis Ave., Long Beach, Calif. 90805.*

**133. URBAN PARK.** — **Location:** California; Los Angeles Co., Whittier, Intersection of Las Cumbres Avenue and Arbela Avenue; 33°57'N, 117°59'W, La Habra Quadrangle, USGS. **Continuity:** New. **Size:** 6.29 ha = 15.55 acres; 115 yards on Las Cumbres Avenue extending N 350 yards to the 315 yard E-W border. **Description of Plot:** The dominant canopy trees are *Eucalyptus* and Black Pine (*Pinus thunbergii*). Most prominent in the understory is Elderberry (*Sambucus canadensis*). The ground cover is primarily wild carrot and wild mustard. A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on eight circular samples, 68.9/acre; total basal area 69.5 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Eucalyptus, 28.6, 42, 48, 63; oak (*Quercus* sp.), 14.3, 21, 18, 63; Black Pine, 13, 19, 26, 50; Elderberry, 13, 19, 8, 38. Trees by diameter size class: A (3-6 in.) 6.5, 9, 6.5, 1; B (6-9 in.) 14.3, 21, 4.3, 5; C (9-15 in.) 13, 19, 10.4, 12; D (15-21 in.) 26, 38, 46.8, 52; E (21-27 in.) 9.1, 13, 28.2, 31. Shrub stems/acre, 3750; ground cover, 73.5%; canopy cover, 33%; average canopy height, 39 ft (range 20-80). **Edges:** Bordered on N by similar habitat; W, E and S by residential areas. **Elevation:** 450 ft. **Weather:** Average high, 74°; low, 52°F. Early morning fog on two occasions. **Coverage:** April 20, 23-24; May 1, 3, 7-8, 11, 13-14; 0500-0800 or 1700-2000. Total man-hours 30. **Census:** House Finch, 17 (276, 112); House Sparrow, 11 (179, 72); Anna's Hummingbird, 8 (130, 53); Mockingbird, 8; Starling, 8; Brown Towhee, 8; Am. Goldfinch, 6 (97, 39); Wilson's Warbler, 6; Cliff Swallow, 5 (81, 33); Mourning Dove, 4 (65, 26); Black-chinned Hummingbird, 4; Scrub Jay, 4; Com. Flicker, 3 (49, 20); Warbling Vireo, 3; N. Oriole, 3; Black-headed Grosbeak, 3; Song Sparrow, 3; Loggerhead Shrike, 2; Lark Sparrow, 2. **Total:** 19 species; 113 territorial males or females (1835/km<sup>2</sup>, 742/100 acres). **Remarks:** Three nests were located: Com. Flicker (1), Warbling Vireo (1), and Brown Towhee (1). Many exotic ornamental shrubs on plot. — *MARK S. NOEL, Calif. State Univ., Long Beach and 11086 Lavender Avenue, Fountain Valley, Calif. 92708.*

**134. FARM WITH PONDS.** — **Location:** Utah, Washington Co., Springdale Town (Springdale Development Corp. properties); 37°10'N, 113°00'W; Zion Nat'l Park Topographic Map (Zion Canyon Section), USGS. **Size:** 10.52 ha = 26 acres (previously surveyed and fenced; an irregular group of adjoining plots, roughly rectangular). **Continuity:** New. **Topography:** North Fork of Virgin R. circles the SE and S edges. Three hay fields slope gently to the S into ponds and sloughs that drain into the river. A dry wash runs S to divide the plot and pass between the two largest ponds. **Elevation:** 1174 meters (3850 ft). **Description of Plot:** The hay fields, covering 17.5 acres, are planted to Alfalfa (*Medicago sativa*) and Orchard Grass (*Dactylis glomerata*), with Buckhorn Plantain (*Plantago lanceolata*) the most common weed. The fields were grazed heavily until June 1, and then were allowed to grow for hay. Three ponds cover about 1.4 acres. During the past two summers Com Cattail (*Typha latifolia*) and Bulrush (*Scirpus validus*) have invaded one pond, covering most of its area. A 1.4-acre peach orchard in the SW part of the plot has Orchard Grass as ground cover. A 5.7-acre belt of

riparian woodland parallels the river. Four tree species, almost equally represented in the canopy, are: Black Willow (*Salix lasiandra*), Fremont Cottonwood (*Populus fremontii*), Velvet Ash (*Fraxinus velutina*) and Box-elder (*Acer negundo*). Sandbar Willows (*S. exigua*) and sapling Black Willows are most prominent in the understory, and *Baccharis emoryi* grows on the edges of the woodland and in clearings. Water from the ponds runs through the woodland, forming dense thickets of Com Cattail. Field Mint (*Mentha arvensis*) and Watercress (*Rorippa nasturtium-aquaticum*) are dominant as ground cover near the sloughs. **Edge:** The N and W sides are bordered by farmland that is being converted to residential use. At the NE corner a small farm contains orchards and 3 additional ponds; one of these drains southward to feed the smallest of the 3 ponds on the plot. Utah Highway 15 adjoins the S half of the W boundary. **Weather:** Hot and dry, with no rain between May 21 and July 14. **Coverage:** May 2, 9, 16, 23, 30; June 6, 13, 20, 27, July 4, 11, 18, 25; Aug. 1, 8, 15; 0600-1230, MDT. Total man-hours: 44. **Census:** Red-winged Blackbird, 14 (133, 54); Black-chinned Hummingbird, 7 (67, 27); Rough-winged Swallow, 7; Lesser Goldfinch, 6 (57, 23); Mourning Dove, 5 (48, 19); Blue Grosbeak, 5; House Finch, 5; Am. Robin, 4 (38, 15); Starling, 4; Yellow Warbler, 4; Black-headed Grosbeak, 4; Song Sparrow, 4; Ring-necked Pheasant, 3 (29, 12); Virginia Rail, 3; Black-capped Chickadee, 3; Bewick's Wren, 3; W. Meadowlark, 3; N. Oriole, 3; Indigo Bunting, 2.5; Gambel's Quail, 2; Spotted Sandpiper, 2; Black Phoebe, 2; Say's Phoebe, 2; W. Wood Pewee, 2; Warbling Vireo, 2; Com. Yellowthroat, 2; Am. Coot, 1; Belted Kingfisher, 1; Hairy Woodpecker, 1; W. Kingbird, 1; Willow Flycatcher, 1; Scrub Jay, 1; House Wren, 1; Mockingbird, 1; Blue-gray Gnatcatcher, 1; Phainopepla, 1; Solitary Vireo, 1; Yellow-breasted Chat, 1; Screech Owl, + **Total:** 39 species; 115.5 territorial and non-territorial males and female hummingbirds and blackbirds (1098/km<sup>2</sup>, 444/100 acres). **Remarks:** Nests found: 52 of 19 species. The Virginia Rails were censused by use of a tape recorder. Lucy's Warblers were occasionally seen in the cottonwoods along the river, but no territories could be determined. Although Brown-headed Cowbirds were not seen, they were usually present in an adjoining field. — *JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767.*

**135. COTTONWOOD RIVERBOTTOM - PASTURE.** — **Location:** Colorado; Weld Co., about 6 mi S and 1 mi. E of Johnstown on E bank of St. Vrain Creek and 1 mi. upstream from its confluence with the South Platte River. Bordered on the E by Weld Co. Road No 38, S3, T3N, R67W, 40°14'N, 104°52'W, Johnstown Quadrangle, USGS. **Continuity:** Established 1973, 4 consecutive years. **Size:** 71.6 ha = 176.9 acres (measured from aerial photograph with planimeter). **Description of Plot:** See AB 27:1006-1007, (1973). **Weather:** Mostly clear, occasionally overcast, warm to hot. **Coverage:** April 20; May 6, 13, 23, 31; June 7, 13, 21; July 2; dawn-1000 hours. Total man-hours: 29. **Census:** W Meadowlark, 26 (36, 15); Starling, 22 (31, 12); Red-winged Blackbird, 20 (28, 11); House Wren, 16 (22, 9); Mourning Dove, 10 (14, 6); Com. Flicker, 7 (10, 4); Com. Yellowthroat, 6 (8, 3); Brown-headed Cowbird (females),

5 (7, 3); Killdeer, 4 (6, 2); E. Kingbird, 4; Am. Kestrel, 3 (4, 2); Spotted Sandpiper, 3; Red-headed Woodpecker, 2; Brown Thrasher, 2; N. Oriole, 2; Blue Grosbeak, 2; Am. Robin, 2; Am. Bittern, 1; Mallard, 1; Ring-necked Pheasant, 1; Com. Snipe, 1; Rock Dove, 1; Great Horned Owl, 1; Screech Owl, 1; Blue Jay, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Com. Grackle, 1; Am. Goldfinch, 1; Song Sparrow, 1. **Total:** 30 species; 149 territorial males, and female cowbirds ( $208/\text{km}^2$ , 84/100 acres). **Remarks:** Major increases (> 50%) occurred in 7 species, while a major decrease was noted in the House Wren. American Bitterns and Blue Grosbeaks were new breeders. Again, 3 species of owls used the area, although the Burrowing did not appear to have nested. A large prairie dog town (150+ animals) was almost totally exterminated by poison baiting by the resident cattleman during June. The plot has been censused regularly since its establishment in 1972 as a continuing avian monitoring program to evaluate the effects of the Fort St. Vrain Nuclear Generating Station. — RONALD A. RYDER, Dept. of Fishery & Wildlife Biology, Colorado State Univ., Ft. Collins, Colo. 80523.

**136. SUBARCTIC TAIGA: LOWLAND BLACK SPRUCE FOREST AND MUSKEG.** — **Location:** Alaska; Fairbanks-North Star Borough, N boundary of Fairbanks Wildlife Management Area;  $64^\circ 53' \text{N}$ ,  $148^\circ 46' \text{W}$ , Fairbanks D-2 Quadrangle, USGS. **Continuity:** New (1975). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** See AB 30:1052 (1976). Additional data: Based on 98 sample units, ground cover is comprised of 8% grasses, 10% herbs, 42% moss, 9% lichens, 23% low shrubs, and 8% forest litter. Open water was found on 33% of the units, evidence of forest fire on 4%. Mean tree diameter 6 cm (2.4 in.), total basal area  $2.7 \text{ m}^2/\text{ha}$  (11.8 ft<sup>2</sup>/acre). Density of trees 815 stems/ha (330/acre). Relative importance of trees and tall shrubs: Black Spruce (*Picea mariana*) 57%, Tamarack (*Larix laricina*) 42%, and White Spruce (*Picea glauca*) 1%. Canopy coverage 8%, light transmittance 92%. Average height of canopy 5 m (16-ft), tallest trees 10 m (33 ft). Density of brush 7904 stems/ha (3199/acre). Most prominent brush species are *Betula glandulosa*, *Salix brachycarpa*, and *S. planifolia*. Most frequent ground cover species are *Sphagnum* sp., *Rubus chamaemorus*, and *Calamagrostis canadensis*. Plant names are from E. Hultén, *Flora of Alaska and Neighboring Territories*, 1968. **Weather:** Hot days to  $32^\circ \text{C}$  ( $90^\circ \text{F}$ ), with cool mornings (some near or below freezing) and occasional thunderstorms. **Coverage, 1975:** May 5, 9, 21-22; June 3-5, 25-26; July 9; 0400-0800. Total man-hours: 40. **Census, 1975:** Dark-eyed (Slate-colored) Junco, 8 (80, 32); White-crowned Sparrow, 4.5 (45, 18); Com. Snipe, 2; Gray-cheeked Thrush, 2; Yellow-rumped (Myrtle) Warbler, 2; Lesser Yellowlegs, 1; Bohemian Waxwing, 1; Com. Redpoll, 1; Olive-sided Flycatcher, 0.5; Gray Jay, 0.5; Am. Robin, 0.5; Ruby-crowned Kinglet, 0.5. **Total:** 12 species; 23.5 territorial males or females ( $235/\text{km}^2$ , 95/100 acres). **Visitors:** Solitary Sandpiper, Mew Gull, Com. (Yellow-shafted) Flicker, Tree Swallow, Rusty Blackbird, Pine Grosbeak, Savannah Sparrow, Fox Sparrow, Lincoln's Sparrow. **Remarks:** This plot had the second-lowest number of breeding species of the five taiga habitats studied, with low breeding density. Species

diversity ( $H'$ ) was calculated at 2.043. One Lesser Yellowleg nest was found. Thanks to Alaska Dept of Fish and Game for financial support, and to Marilyn Sigman and Michele Mouton for help in vegetation sampling. — MICHAEL A. SPINDLER, Alaska Cooperative Wildlife Research Unit, Univ. of Alaska, Fairbanks, Ak., 99701.

**137. SUBARCTIC TAIGA: LOWLAND SERAL BIRCH-WILLOW.** — **Location:** Alaska; Fairbanks-North Star Borough, center of Fairbanks Wildlife Management Area;  $64^\circ 52' \text{N}$ ,  $148^\circ 43' \text{W}$ , Fairbanks D-2 Quadrangle, USGS. **Continuity:** New (1975). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** See AB 30:1052, (1976). Additional data: Based on 98 sample units, ground cover is comprised of 46% grass, 8% herbs, 8% moss, 2% lichen, 29% low shrubs, 1% water, and 6% forest litter. Grass or sedge tussocks cover 13% of the ground surface, open water was found on 51% of all units, evidence of forest fire on 63%. Mean tree diameter 4.9 cm (1.9 in.), total basal area  $3.9 \text{ m}^2/\text{ha}$  (17.0 ft<sup>2</sup>/acre), density of trees 1623 stems/ha (657/acre). Relative importance of trees and large shrubs: Paper Birch (*Betula papyrifera*) 67%; willow (*Salix* spp.) 29%, Black Spruce (*Picea mariana*) 2%; Thinleaf Alder (*Alnus incana*) 1%; White Spruce (*Picea glauca*) 1%. Canopy coverage 16%, light transmittance 96%. Average height of canopy 4.4 m (14 ft), tallest trees 9 m (30 ft). Density of brush 55,575 stems/ha (22,491/acre). Most prominent brush species are *Salix bebbiana*, *S. arbusculoides* and *Salix planifolia*. Most prominent ground cover species are *Calamagrostis canadensis*, *Eriophorum vaginatum*, *Vaccinium vitis-idaea*, *V. uliginosum* and *Ledum palustre*. **Weather:** See Census 136. **Coverage, 1975:** May 7, 14, 30-31; June 12-13; July 2-3, 16; 0400-0800 Total man-hours: 36. **Census, 1975:** Yellow Warbler, 10 (100, 40); Lincoln's Sparrow, 8 (80, 32); Com. Snipe, 5 (50, 20), N. Waterthrush, 5; White-crowned Sparrow, 5; Alder Flycatcher, 4 (40, 16); Rusty Blackbird, 4; Tree Sparrow, 4; Com. Redpoll, 3 (30, 12); Pintail, 2; Fox Sparrow, 2; Green-winged Teal, 1; Solitary Sandpiper, 1; Swainson's Thrush, 1; Gray-cheeked Thrush, 1; Orange-crowned Warbler, 1. **Total:** 16 species; 57 territorial males or females ( $570/\text{km}^2$ , 231/100 acres). **Visitors:** Blue-winged Teal; Am. Wigeon; N. Shoveler; Sandhill Crane; Lesser Yellowlegs; N. Phalarope; Com. Flicker; Violet-green Swallow; Tree Swallow; Black-capped Chickadee; Boreal Chickadee; Yellow-rumped (Myrtle) Warbler; Wilson's Warbler; Savannah Sparrow. **Remarks:** Of the five taiga habitats studied, this plot had the second-greatest breeding bird density, and an intermediate number of breeding species, both of which can be attributed to numerous ponds, willow patches and maturing birch forest. Species diversity ( $H'$ ) was calculated at 2.525, which is also intermediate in the five plots studied. Nests found: One each of Com. Snipe, Yellow Warbler, and Rusty Blackbird. Thanks to Alaska Department of Fish and Game for financial support, and Youth Conservation Corps for help in vegetation sampling. — MICHAEL A. SPINDLER, Alaska Cooperative Wildlife Research Unit, Univ. of Alaska, Fairbanks, AK 99701

**138. SUBARCTIC TAIGA: LOWLAND TALL SHRUBS.** — **Location:** Alaska; Fairbanks-North Star

Borough, center of Fairbanks Wildlife Management Area, 64°52'N, 148°42'W, Fairbanks D-2 Quadrangle, USGS. **Continuity:** New (1975). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** See AB 30:1052 (1976). Additional Data: Based on 98 sample units, ground cover is comprised of 31% grass, 11% herbs, 9% moss, 3% lichen, 37% low shrubs, 1% water, 8% forest litter. Open water was found on 59% of all units; evidence of forest fire on 12%. Mean tree diameter 4.5 cm (1.8 in.), total basal area 0.94 m<sup>2</sup>/ha (4.1 ft<sup>2</sup>/acre), density of trees 663 stems/ha (268/acre). Relative importance of trees and tall shrubs: Thinleaf Alder (*Alnus incana*) 67%; willow (*Salix* sp.) 13%, White Spruce (*Picea glauca*) 9%, Black Spruce (*P. mariana*) 6%, Tamarack (*Larix laricina*) 5%. Canopy coverage 26%, light transmittance 91%. Average height of canopy 3.7 m (12 ft), tallest trees 10 m (33 ft). Density of brush 47,424 stems/ha. Most prominent brush species are *Salix arbusculoides*, *S. planifolia*, *S. bebbiana*, and *Betula glandulosa*. Most prominent ground cover species are *Chamaedaphne calyculata*, *Ledum palustre*, *Vaccinium uliginosum*, *Calamagrostis canadensis*, and *Rubus arcticus*. **Weather:** See Census 136. **Coverage, 1975:** May 4, 12, 23-24; June 9, 11, 27, 30; July 11; between 0400 and 0800. Total man-hours: 36. **Census, 1975:** Yellow Warbler, 10 (100, 40); Com. Snipe, 7.5 (75, 30); Lincoln's Sparrow, 6.5 (65, 26); Tree Sparrow, 6 (60, 24); N. Waterthrush, 4.5 (45, 18); Gray-cheeked Thrush, 4 (40, 16); Blackpoll Warbler, 3 (30, 12); Fox Sparrow, 3; Green-winged Teal, 2; Solitary Sandpiper, 2; Lesser Yellowlegs, 2, Dark-eyed (Slate-colored) Junco, 2; Alder Flycatcher, 1.5; Pintail, 1; Swainson's Thrush, 1; Rusty Blackbird, 1; White-crowned Sparrow, 1. **Total:** 17 species; 58 territorial males or females (580/km<sup>2</sup>, 235/100 acres). **Visitors:** Mallard, Com. Flicker, Hammond's Flycatcher, Tree Swallow, Gray Jay, Black-capped Chickadee, Boreal Chickadee, Am. Robin; Ruby-crowned Kinglet, Bohemian Waxwing, Orange-crowned Warbler, Yellow-rumped (Myrtle) Warbler, Pine Grosbeak, Savannah Sparrow. **Remarks:** Unexpectedly, this senescent tall shrub community supported greater breeding bird densities than adjacent climax Spruce-Birch forest. It had the greatest density of the five taiga habitats studied, and the second-greatest number of species. The great horizontal habitat diversity, offering wet marshes, dry brush, rank herbs and grasses, extensive deciduous shrub cover, and occasional coniferous growth, is most likely the cause for such great density and diversity. Species diversity (H') was calculated at 2.576. Three Com. Snipe nests (4 eggs each) were discovered on small grass hummocks just above waterline. Thanks to Alaska Dept of Fish and Game for financial support, and the Youth Conservation Corps for help in vegetation sampling. — *MICHAEL A. SPINDLER, Alaska Cooperative Wildlife Research Unit, Univ. of Alaska, Fairbanks, AK 99701*

**139. SUBARCTIC TAIGA: LOWLAND TUSSOCK LOW SHRUB BOG.** — **Location:** Alaska; Fairbanks-North Star Borough; center of Fairbanks Wildlife Management Area; 64°52'N, 148°44'W, Fairbanks D-2 Quadrangle, USGS. **Continuity:** New (1975). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** The vegetation is dominated by extensive *Eriophorum vaginatum* sedge tussocks growing up to one meter above the

ground with ericaceous low shrubs growing between and on top of the tussocks. Forest growth is absent, although a few sparse, stunted Paper Birches (*Betula papyrifera*), Black Spruces (*Picea mariana*), and Thinleaf Alders (*Alnus incana*) characteristic of muskeg habitats are interspersed across the bog. Based on 98 sample units, ground cover is comprised of 48% grass and sedges, 9% herbs, 10% moss, 4% lichens, 22% low shrubs, and 7% forest litter; grass and sedge tussocks cover 42% of the ground surface. Open water was found on 14% of all units, evidence of past fire on 25%. Mean tree diameter 3.3 cm (1.3 in.), total basal area, 0.025 m<sup>2</sup>/ha (0.1 ft<sup>2</sup>/acre), density of trees 28 stems/ha (11/acre). Relative importance of the tree and tall shrub species are: Paper Birch 75%, Thinleaf Alder 24%, and Black Spruce 1%. Canopy coverage 0.4%, light transmittance 99%. Average height of trees 3.5 m (11 ft), tallest trees 6 m (20 ft). Density of brush 37,544 stems/ha (15,194/acre). Most prominent brush species are *Salix planifolia*, *S. arbusculoides*, *Betula glandulosa*, *B. nana*, *Ledum palustre* and *Chamaedaphne calyculata*. The most prominent ground cover species are *Eriophorum vaginatum*, *Calamagrostis canadensis*, *Rubus chamaemorus*, *Vaccinium vitis-idaea*, and *V. uliginosum*. **Edge:** Bordered on N and W by similar habitat, on S and E, by seral birch-willow stands. A dog sled trail bisects the plot. **Topography:** Flat, underlain by permafrost, with extensive polygonization. **Elevation:** 137 m (450 ft). **Water:** Numerous ice-wedge polygon troughs are water-filled. **Weather:** See Census 136. **Coverage, 1975:** May 6, 15-16; June 1-2, 17-18; July 6-7; 0400-0800. Total man-hours: 36. **Census, 1975:** Lincoln's Sparrow, 8 (80, 32); White-crowned Sparrow, 5.5 (55, 22); Tree Sparrow, 5 (50, 20); Com. Snipe, 2, Orange-crowned Warbler, 2; Alder Flycatcher, 1; Sandhill Crane, +. **Total:** 7 species; 23.5 territorial males or females (235/km<sup>2</sup>, 95/100 acres). **Visitors:** Com. Flicker, Violet-green Swallow, Am. Robin, Swainson's Thrush, Bohemian Waxwing, Rusty Blackbird, Com. Redpoll, Dark-eyed Junco. **Remarks:** This plot had the lowest number of breeding species and tied for the lowest density of the five taiga habitats studied; species diversity (H') was calculated at 1.610 (counting the "+" as 0.1). One Lincoln's Sparrow nest was found. Thanks to Alaska Department of Fish and Game for financial support, and to the Youth Conservation Corps for help in vegetation sampling. — *MICHAEL A. SPINDLER, Alaska Cooperative Wildlife Research Unit, Univ. of Alaska, Fairbanks, AK 99701*.

**140. SUBARCTIC TAIGA: LOWLAND WHITE SPRUCE-PAPER BIRCH FOREST.** — **Location:** Alaska; Fairbanks-North Star Borough, N boundary of Fairbanks Wildlife Management Area; 64°51'N, 148°41'W, Fairbanks D-2 Quadrangle, USGS. **Continuity:** 1975 (New). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** See AB 30: 1052 (1976). Additional data: Based on 98 sample units, ground cover is composed of 13% grasses, 11% herbs, 33% moss, 6% lichens, 21% low shrubs, and 16% forest litter. Open water was found on 14% of the units; evidence of forest fire on 27% of the units. Mean tree diameter 7.8 cm (3 1 in.), total basal area 13.4 m<sup>2</sup>/ha (58.4 ft<sup>2</sup>/acre), density of trees 2016 trees/ha (816/acre). Relative importance of trees and tall shrubs: White Spruce (*Picea glauca*) 48%, Black Spruce (*Picea mariana*) 24%; willow (*Salix* sp.)

11%; Paper Birch (*Betula papyrifera*) 9%; Thinleaf Alder (*Alnus incana*) 8%. Canopy coverage 34%, light transmittance 86%. Average height of canopy 7 m (23 ft), tallest trees 14 m (46 ft). Density of brush 37,544 stems/ha (15,194/acre). Most prominent brush species are *Salix arbusculoides*, *S. planifolia*, *S. bebbiana*, and *Alnus incana*. Most prominent ground cover species are: *Vaccinium uliginosum*, *V. vitis-idaea*, *Ledum palustre*, *Equisetum pratense*, *Calamagrostis canadensis*, and *Rubus arcticus*. **Weather:** See Census 136. **Coverage:** 1975: May 5, 13, 19-20; June 5-6, 19-20; July 10; 0400-0800. Total man-hours: 36. **Census, 1975:** Dark-eyed Junco, 7 (70, 28); Swainson's Thrush, 5 (50, 20); Yellow-rumped (Myrtle) Warbler, 4.5 (45, 18); Com. Snipe, 2; N. Waterthrush, 2; Fox Sparrow, 2; Boreal Chickadee, 1; Ruby-crowned Kinglet, 1; White-crowned Sparrow, 1; Olive-sided Flycatcher, 0.5; Gray Jay, 0.5; Gray-cheeked Thrush, 0.5; Wilson's Warbler, 0.5; Pine Grosbeak, 0.5; Com. Redpoll, 0.5; Alder Flycatcher, +; Black-capped Chickadee, +; Am. Robin, +; Varied Thrush, +; Orange-crowned Warbler, +; Rusty Blackbird, +. **Total:** 21 species, 28.5 territorial males or females (285/km<sup>2</sup>, 115/100 acres). **Visitors:** Am. Kestrel, Solitary Sandpiper, Lesser Yellowlegs, Com. Flicker, Tree Swallow, Bohemian Waxwing, Tree Sparrow, Lincoln's Sparrow. **Remarks:** This habitat had the greatest number of breeding species of the five lowland taiga habitats studied. Species diversity (H') was calculated at 2.340 (counting each "+" as 0.1). Thanks to the Alaska Dept. of Fish and Game for financial support, and the Youth Conservation Corps for help in vegetation sampling. — **MICHAEL A. SPINDLER**, Alaska Cooperative Wildlife Research Unit, Univ. of Alaska, Fairbanks, AK 99701.

**141. WET COASTAL PLAIN TUNDRA (I).** — **Location:** Alaska; North Slope Borough, 3 km due S of Naval Arctic Research Laboratory, Barrow; 71°18'N, 156°42'W; Barrow Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 33.0 ha = 81.5 acres (square, surveyed and gridded). **Description of Plot:** See AB 29 1135 (1975). **Weather:** Average June temperature 33.3°F (departure from normal +0.2°), range, 23°-59°. Average wind speed 10.7 mph. Weather data from NOAA, Barrow, Alaska, 3 km to west. Snow melt-off largely complete by June 14. **Coverage:** May 30-August 30, Censuses on May 31; June 5, 11, 17, 20, 25, 30; July 5; 0900-1200, with several visits in late afternoon. Total man-hours: 32. **Census:** Pectoral Sandpiper, 12 (36, 15); Lapland Longspur, 10.5 (32, 13); Red Phalarope, 10 incubating males (30, 12); Dunlin, 7 (21, 9); Semipalmated Sandpiper, 5.5 (17.7); Steller's Eider, 3 incubating females (9,4); Snow Bunting, 2; Am. Golden Plover, 1.5; Baird's Sandpiper, 1.5; Pomarine Jaeger, 1.5; Savannah Sparrow, 0.5; Snowy Owl, +; Short-eared Owl, +. **Total:** 13 species; 55 territorial males or females (167/km<sup>2</sup>, 67/100 acres). **Visitors:** Pintail, Oldsquaw, King Eider, Long-billed Dowitcher, Ruddy Turnstone. **Remarks:** As in our 1975 census, we calculated densities of Pectoral Sandpipers as the number of incubating females; average number of territorial males present on the plot was 7 (21, 9). Pectoral territories were considerably more stable than last year, with no marked influx of males in late June, which has otherwise proven to be a recurrent pattern of Barrow area Pectorals. Red

Phalarope and Pomarine Jaeger densities were also calculated as last year. Nests located (number successfully hatched in parentheses): Steller's Eider, 2 (1); Am. Golden Plover, 1 (0); Pectoral Sandpiper, 12 (9); Dunlin, 8 (7); Semipalmated Sandpiper, 6 (6); Baird's Sandpiper, 1 (1); Red Phalarope, 10 (9); Pomarine Jaeger, 1 (1); Lapland Longspur, 10 (7). **Predation:** Plot visited regularly by Arctic Fox, Short-tailed Weasel, Pomarine Jaeger, Snowy Owl, and Short-eared Owl, and once by a Peregrine Falcon. All predators except the Peregrine were present primarily because of high lemming densities, measured in mid-June by capture-recapture methods to be 50-60/ha on plot 1, but averaging less than this over the general area. Both Pomarine Jaeger and Snowy Owl densities were lower than expected given the number of lemmings present. Short-eared Owls were more abundant than in any year since 1953. Savannah Sparrows nested in several locations near the Laboratory, providing the first nesting records of this species for the Barrow region. Comparing other species densities with previous years, Steller's Eider and Pectoral Sandpiper achieved high densities, whereas the Red Phalarope declined somewhat from the peak reached last year. Lapland Longspur numbers increased (see Custer and Pitelka, *Auk* 94, in press). This work was funded by NOAA-OCS as part of a study of shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska, for logistical support. — **J. P. MYERS, R. S. GREENBERG, and F. A. PITELKA**, Museum of Vertebrate Zoology, Univ. of Calif., Berkeley, Calif. 94720.

#### 142. WET COASTAL PLAIN TUNDRA (II). —

**Location:** Alaska; North Slope Borough, 3 km SSW of Naval Arctic Research Laboratory, Barrow; 71°18'N, 156°43'W; Barrow Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 27.0 ha = 66.7 acres (rectangular, surveyed and gridded). **Description of Plot:** See AB 29:1135-6 (1975). **Weather:** See Census 141, but snow melt-off occurred approximately 3 days later. **Coverage:** May 31; June 5, 9, 14, 18, 22, 28; July 3; between 0900-1200, with several afternoon visits. Total man-hours 32, plus 50 additional hours on the plot during census period. **Census:** Red Phalarope, 8 incubating males (30, 12); Steller's Eider, 7 incubating females (26, 10); Pectoral Sandpiper, 6 incubating females (22, 9); Lapland Longspur, 6; Dunlin, 5.5 (20, 8); Semipalmated Sandpiper, 2; Pomarine Jaeger, 1.5; Oldsquaw, 1; Am. Golden Plover, 1; Ruddy Turnstone, 1; Snow Bunting, 1; King Eider, +; Baird's Sandpiper, +; Long-billed Dowitcher, +; Snow Bunting, 1; King Eider, +; Baird's Sandpiper, +; Long-billed Dowitcher, +; Short-eared Owl, +. **Total:** 15 species; 40 territorial males or females (148/km<sup>2</sup>; 60/100 acres). **Visitors:** Red-throated Loon, Pintail. **Remarks:** See Census 141 re calculation of densities. Average number of territorial male Pectorals 4.5 (17, 7). **Predation:** Plot visited regularly by Arctic Fox, Short-tailed Weasel, and the avian predators recorded as breeding birds; lemming densities comparable to Census 141. Four Steller's Eider nests and 1 Oldsquaw nest lost to predators. In addition, human visitors, particularly local children, interrupted breeding in 3 of 4 Pomarine Jaeger pairs, destroying nests and killing adults. Nests located (number successfully hatched in parentheses) Oldsquaw, 1 (0); Steller's Eider, 7 (3); Am. Golden

Plover, 1 (0); Pectoral Sandpiper, 6 (6); Dunlin, 4 (4); Semipalmated Sandpiper, 2 (2); Ruddy Turnstone, 1 (1); Red Phalarope, 10 (9); Pomarine Jaeger, 2 (1). For both plots I and II, extensive field time and excellent visibility afforded by tundra ensured that at least 95% of all nests were found. On Plot II, Pectoral densities were significantly lower than last year, for both incubating females and territorial males. For males, this results at least in part because of the absence of a late June influx (see previous census). Steller's Eider density was markedly higher than last year, while the number of Red Phalaropes dropped. No obvious environmental conditions correlate with these changes. This work was funded by NOAA-OCS as part of a study of shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska, for logistical support. — J. P. MYERS, R. S. GREENBERG, and F. A. PITELKA, Museum of Vertebrate Zoology, Univ. of Calif., Berkeley, Calif. 94720

**143. SHRUBBY SWAMP AND SEDGE HUM-MOCKS.** — **Location:** Connecticut; Litchfield Co., N end of Bantam Lake, White Memorial Foundation, Litchfield, 41°43'02"N, 73°12'27"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 10 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 19:625-627 (1965). A river delta in two parts, 5 and 15 acres respectively, on either side of the Bantam R. as it flows into Bantam L. **Coverage:** May 24; June 6-9; 12-15; 0430-2000. Total man-hours: 48. **Census:** Red-winged Blackbird, 32 (396, 160); Swamp Sparrow, 32; Yellow Warbler, 24 (297, 120); Com. Yellowthroat, 16 (198, 80); Virginia Rail, 14 (173, 70); Willow Flycatcher, 11 (136, 55); Long-billed Marsh Wren, 8 (99, 40); Song Sparrow, 8; Mallard, 6 (74, 30); Gray Catbird, 6; Cedar Waxwing, 6; Am. Goldfinch, 6; Alder Flycatcher, 3 (37, 15); Wood Duck, 1; Am. Coot, 1; Com. Flicker, 1; E. Kingbird, 1; Tree Swallow, 1; Chestnut-sided Warbler, 1; Green Heron, 0.5; Veery, 0.5; Yellow-throated Vireo, +. **Total:** 22 species; 179 territorial males (2213/km<sup>2</sup>, 895/100 acres). **Remarks:** It was the driest census period since 1965; standing water varied from 0 to 2 ft. General numbers were high. A solitary Am. Coot, and single pairs of Green Heron and Wood Duck, were present throughout, but probably did not breed. Visitors included Great Blue Heron, Black-crowned Night Heron, Canada Goose, Black Tern, and Tree, Bank, and Barn Swallows. Special thanks to Jim Cavanaugh for his help. — ANDREW MAGEE, Woollybear, Troy, N.H. 03465.

**144. EVERGLADES MARSH.** — **Location:** Florida; Dade Co., Everglades Nat'l Park, approximately 30 mi W of Miami; SW corner at 25°38'20"N, 80°44'20"W, Everglades East Quadrangle, USGS. **Continuity:** New. **Size:** 44.6 ha = 110.2 acres (generally square, measured from aerial photo). **Description of Plot:** See AB 30:1065, (1976). **Weather:** By end of dry season water in marshes had dropped to about 1 in. with higher sawgrass and pond edges dry. Rainy season began relatively early, in early May. **Coverage:** April 13, 21; May 6, 18, 20; June 7-8, 16-17, 22; July 13. Including all daylight hours, one night trip. Total man-hours: 68. **Census:** Green Heron, 14 (31, 13); Red-winged Blackbird, 8 (18, 7); Com. Yellowthroat, 7 (16, 6); Boat-tailed Grackle, 5 (11, 5); Louisiana Heron, 2; Cardinal, 2; Carolina Wren, 2;

Anhinga, 1; King Rail, 1; Purple Gallinule, 1; Red-shouldered Hawk, +; Limpkin, +; Barred Owl, +. Also using area: Great Blue Heron (2); White Ibis (2); Am Egret (1); Turkey Vultures (1). **Total:** 13 (10 nesting) species; 43 males (96/km<sup>2</sup>, 39/100). **Remarks:** Heron, blackbird, and Anhinga nests were located; total 91 nests. Green Heron nests (27) represented minimum of 14 individual pairs with renesting. — JAMES A KUSHLAN and MARILYN S. KUSHLAN, U.S. National Park Service, Everglades National Park, Homestead, Fl. 33030.

**145. CATTAI MARSH.** — **Location:** Ontario, Haldimand-Norfolk Regional Municipality, 3 miles SE of Port Rowan; 42°35'40"N, 80°23'80"W, Port Rowan, Dept. Energy, Mines and Resources, Ottawa. **Continuity:** New. **Size:** 2.76 ha = 6.82 acres (400 x 50-100 m; line of survey stakes 50 m apart through long axis, size determined from aerial photos). **Description of Plot:** A dense stand of Com. Cattail (*Typha latifolia*) on the shore of Lake Erie; with channels and pools comprising approximately 5-10% of surface area. Water depth 0-4 ft, average about 1.5-2 ft. Cattails make up over 95% of plants present. Plants in open areas, submergent or emerging mainly after the breeding season, are mostly Water Flaxseed (*Spirodela polyrhiza*), Pickerelweed (*Pontederia cordata*), Yellow Water Lily (*Nuphar advena*), White Water Lily (*Nymphaea tuberosa*), White Water Crowfoot (*Ranunculus trichophyllum*), Water Star Grass (*Heteranthera dubia*) and Greater Bladderwort (*Utricularia vulgaris*). **Edge:** Surrounded by open water. Large bay on one side of plot; shallower, calmer water with more cattail stands and more diverse marsh plants on the other side, separated from nearest emergent vegetation by a 30 ft channel. **Topography:** Flat **Elevation:** 575 ft. **Weather:** Normally warm and clear **Coverage:** May 27, 29; June 3-5, 8-10, 12. Total man-hours: 30. **Census** (based on number of breeding females): Red-winged Blackbird, 101 (3659, 1481); Black Tern, 8 (290, 117); Com. Gallinule, 7 (254, 103); Mallard, 2; Least Bittern, 1. **Total:** 5 species; 119 females with nests (4312/km<sup>2</sup>, 1745/100 acres). **Visitors:** Forster's Tern, Barn Swallow, Tree Swallow, Purple Martin, Long-billed Marsh Wren (3 dummy nests found), Com Grackle. Only marsh wrens may have bred, but others fed here regularly. **Remarks:** Censusing was done entirely by canoe, as the bottom mud was too soft. Our method was to search for and tag nests with small numbered flags, because shortness of visibility and density of nests made it extremely difficult to count singing males. Density of cattails made progress very slow, so the entire area was searched only twice (about 2/3 was covered three times). Numbers for all species except Black Tern are certain to be underestimates. An enormous crop of insects emerged in early June. A half-dozen Long-billed Marsh Wrens were heard during a brief visit August 4, so this species may also have nested, perhaps starting after our searches ended. Black Tern nests were unusual (Cuthbert, *Auk* 71: 36-63) in being built on emergent patches of soft mud rather than on floating dead plant material. — ERICA H. DUNN and ERICA NOL, Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ontario, Canada, NOE 1MO.

**146. CATTAI MARSH I.** — **Location:** Illinois; Lake Co., N point of Crabapple Island in Fox Lake; 42°27'N, 88°10'W, Fox Lake Quadrangle, USGS. **Continuity:** New. **Size:** 5.9 ha = 14.6 acres (triangular, measured with planimeter). **Description of Plot:** Inland deep fresh marsh, varying in depth from 15 cm to over 1 m; the outer portion is dominated by Narrow-leaved Cattail (*Typha angustifolia*), with Bur-reed (*Sparganium eurycarpum*) becoming increasingly more common toward the center. The deeper water supports Coontail (*Ceratophyllum demersum*), several pondweed species (*Potamogeton*), Lesser Duckweed (*Lemna minor*), Forked Duckweed (*Lemna trisulca*), Giant Duckweed (*Spirodela polyrhiza*), and Watermeal (*Wolffia columbiana*). The E edge has a narrow row of willows (*Salix* sp.) approximately 20 m wide. **Edge:** Two edges are bordered by water, the S edge by similar marsh habitat. **Topography:** Flat. **Elevation:** 730 ft. **Coverage:** June 25-29; July 1; 0500-1000 hours. Total man-hours: 8. **Census:** Long-billed Marsh Wren, 11 (186, 75); Red-winged Blackbird, 1 (169, 68); Swamp Sparrow, 5 (85, 34); Tree Swallow, 3 (51, 21); Starling, 2; Com. Grackle, 2; Virginia Rail, 1.5; Com. Yellowthroat, 1. **Total:** 8 species; 35.5 territorial males (601/km<sup>2</sup>, 243/100 acres). **Remarks:** The water bordered edges were censused by the same method as Census 147. The lower edge was censused by walking through the marsh. Three Tree Swallow and two Starling nests were found. Long-billed Marsh Wrens, Red-winged Blackbirds, and Swamp Sparrows were evenly distributed. Virginia Rails responded to a recording of their voice on four visits. — **RANDALL MADDING** (compiler) and **WILLIAM McCALIN**, R.R. 2, WAPORA, Inc., Charleston, Ill. 61920.

**147. CATTAI MARSH II.** — **Location:** Illinois; Lake Co., Grass Island, N end of Grass Lake; 42°27'N, 88°10'W, Fox Lake Quadrangle, USGS. **Continuity:** New. **Size:** 1.6 ha = 3.9 acres (irregular, measured with a planimeter). **Description of Plot:** Inland shallow fresh marsh. Narrow-leaved Cattail (*Typha angustifolia*) made up nearly 100% of the vegetation. Duckweed (*Lemna minor*) was found in the open areas and Deadly Nightshade (*Solanum dulcamara*) was present at the periphery of the marsh. The entire plot was an unstable floating mat of vegetation. **Edge:** Surrounded on all sides by water. **Topography:** Flat. **Elevation:** 730 ft. **Coverage:** June 25-29; July 1; 0500-1000 hours. Total man-hours: 5. **Census:** Red-winged Blackbird, 8 (507, 205); Long-billed Marsh Wren, 4 (253, 103); Swamp Sparrow, 2; Com. Gallinule, 1. **Total:** 4 species; 15 territorial males (950/km<sup>2</sup>, 385/100 acres). **Remarks:** Because of wave action from boats and wind, much of the island has eroded away, until only 3.9 acres remain. Grass Island was censused by rowing a boat around the island and stopping at 30 m intervals. To increase the field of view over the tall cattails, a small platform was placed on the bow of the boat. The presence of the gallinules was verified when it answered a taped recording of its voice. — **RANDALL MADDING** (compiler) and **WILLIAM McCALIN**, R.R. 2, WAPORA, Inc., Charleston, Ill. 61920.

**148. BULRUSH AND CATTAI MARSH IN CONIFER FOREST.** — **Location:** Montana; Lake Co., on W side of Flathead Lake, 6 mi. N of Polson, on Kings Point Rd.; 47°35'N, 114°09'W, Wild Horse Island Quadrangle USGS. **Continuity:** New. (1975) **Size:** 40.47 ha = 100 acres (irregular rectangle, determined from maps) **Description of Plot:** The marsh is roughly hourglass shaped and contains approximately 32.3 ha = 80 acres about 50% of which is open water. The NE corner stretches into an outlet stream, which flows into a large (30 mi. long x 10 mi. wide), fresh water lake, about 200 m from the marsh. The outlet channel is bisected by an earth dam which once held a headgate (now washed away) and valve. Beavers have maintained the dam to some extent and have constructed three smaller dams on the outlet stream. The marsh fringe is seral conifer forest, with outcroppings and cliffs of sedimentary rock. The degree of succession in the marsh varies greatly. Emergent vegetation is dominated by Hardstem Bulrush (*Scirpus acutus*), in the central, deeper areas, with Common Cattail (*Typha latifolia*), along the shorelines. A small mat of Sedges (*Carex scirpiformis* and *C. utriculata*), grows in very shallow water in the SE corner. The two main areas of open water are located at the wide ends of the marsh, with a winding, connecting channel along the W side. Submerged vegetation consists of Common Bladderwort (*Utricularia vulgaris*), Pondweed (*Najas* sp.), and a very small amount of Lesser Duckweed (*Lemna minor*), in the sedge area. Two small islands hold several white, broken top snags, extensively used by cavity nesters. The marsh has three beaver houses. There are beaver channels through the rushes. Several muskrat houses have furnished emergent nest sites. The bordering forest canopy is Douglas-fir (*Pseudotsuga menziesii*) 75%, and Ponderosa Pine (*Pinus ponderosa*) 25%, of which 5% are standing dead. The understory is composed of Black Hawthorn (*Crataegus douglasii*) and Thinleaf Alder



Bulrush and Cattail Marsh in Conifer Forest. Photo/Marcella Bishop.

(*Alnus tenuifolia*). The shrub layer consists of Buckbrush (*Symphoricarpos occidentalis*) 40%, Wild Rose (*Rosa woodsii*) 20%, Red-Osier Dogwood (*Cornus stolonifera*) 10%, young canopy and understory trees in various stages of growth 20%, Serviceberry (*Amelanchier alnifolia*) 10% and other shrubs including, Buffaloberry (*Shepherdia canadensis*), Black Currant (*Ribes americanum*), Choke Cherry (*Prunus melanocarpa*), and Mountain Spray (*Holodiscus discolor*). Abundant ground cover consists of Oregon Grape (*Mahonia repens*), Bearberry (*Arctostaphylos uva-ursi*), Wild Strawberry (*Fragaria virginiana*), Arrowleaf Balsamroot (*Balsamorhiza sagittata*), and Poison Ivy (*Rhus radicans*). Vegetation on the rocky cliffs consists chiefly of Oregon Grape, Buckbrush and grasses. The tract is grazed occasionally by cattle and regularly by deer. **Edge:** Situated on a wooded, rocky, point which juts out into a large, fresh water lake. Conifer forest on steep, round topped hills, continues inland on a general upward gradient. A dirt road borders the W side and a meadow (4 ha) is at the S end. **Topography:** Marsh and meadow lie in a basin surrounded by steep slopes. A rocky cliff rises along the E side of the marsh. The outlet channel is through steep rock walls. **Elevation:** 2892 ft. **Weather, 1975:** Unseasonably cool, damp, late spring. Observation days had minimal precipitation and moderate or no wind. **Coverage:** April 30; May 13-14, 28; June 4, 12, 16, 22; dawn-1200 hours and 2 evening trips. Total man-hours: 52 **Census, 1975:** Red-winged Blackbird, 58 (143, 58); Song Sparrow, 32 (79, 32); Yellow-headed Blackbird, 20 (49, 20); Com. Yellowthroat, 15 (37, 15); Yellow Warbler, 12 (30, 12); Am. Coot, 8 (20, 8); Barn Swallow, 8; Black-capped Chickadee, 8; Willow Flycatcher, 7 (17, 7); Ruffed Grouse, 5 (12, 5); Mourning Dove, 5; Pied-billed Grebe, 4 (10, 4); Mallard, 4; Redhead, 4; Tree Swallow, 4; Am. Robin, 4; Ruby-crowned Kinglet, 4; Dark-eyed Junco, 4; Great Blue Heron, 3 (7, 3); Canada Goose, 3; Com Nighthawk, 3; Hammond's Flycatcher, 3; W. Wood Pewee, 3; Long-billed Marsh Wren, 3; Hermit Thrush, 3; Nashville Warbler, 3; Chipping Sparrow, 3; Cinnamon Teal, 2; Wood Duck, 2; Black Tern, 2; Violet-green Swallow, 2; Mountain Chickadee, 2; Orange-crowned Warbler, 2; Yellow-rumped Warbler, 2; Am. Redstart, 2; Tree Sparrow, 2; Osprey, 1.5; Pin-tail, 1; Blue-winged Teal, 1; N. Shoveler, 1; Ring-necked Duck, 1; Com. Goldeneye, 1; Ruddy Duck, 1; Com. Merganser, 1; Prairie Falcon, 1; Rufous Hummingbird, 1; Calliope Hummingbird, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Red-breasted Nuthatch, 1; Gray Catbird, 1; Swainson's Thrush, 1; Townsend's Solitaire, 1; Cedar Waxwing, 1; N. Oriole, 1; Brown-headed Cowbird, 1; Great Horned Owl, 0.5; Pileated Woodpecker, 0.5; Com. Merganser, +; Red-tailed Hawk, +; White-crowned Sparrow, +. **Total:** 66 species; 295 territorial males or females (729/km<sup>2</sup>, 295/100 acres). **Visitors:** Ring-billed Gull, Belted Kingfisher. **Remarks:** 37 nests found: Great Blue Heron, 3; Canada Goose, 3; Redhead, 3; Osprey, 1; Prairie Falcon, 1; Am. Coot, 2; Mourning Dove, 3; Com. Flicker, 1; Willow Flycatcher, 2; Tree Swallow, 6; Black-capped Chickadee, 1; Long-billed Marsh Wren, 1; Am. Robin, 2; Swainson's Thrush, 1; Am. Redstart, 1; Yellow-headed Blackbird, 1; Red-winged Blackbird, 2; Song Sparrow, 3. Additional fledglings seen: Pied-billed Grebe, 5; Canada Goose, 3; Wood Duck, 3; Black Tern, 2; Saw-whet Owl, 3; Red-breasted Nuthatch, 1; Hermit Thrush, 2; Swainson's Thrush, 1; Cedar Waxwing, 1; Red-winged Blackbird, 2; Song Sparrow, 8. Predation appears to be rather heavy. Destroyed nests and adult bird kills have been found. One Marten (*Martes americana*) was sighted, as well as tracks and sign of Mink (*Mustela vison*). I thank landowners, Mr. and Mrs William Pinkney, for support and Matthew and Martin Bishop and Lynn Kelly for field assistance — MARCELLA M. BISHOP, 212 Second Avenue E, Polson, Mont. 59860.

**149. FLOODPLAIN POND.** — **Location:** Colorado, Weld Co., about 6 mi. S and 1.5 mi. E of Johnstown Parts of Sects. 34 & 35, T4N, R67W, 40°15'N, 104°52'W, Milliken Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 8.5 ha = 21 acres (measured from an aerial photo with planimeter) **Description of Plot:** See AB: 28:1034-1035 (1974). **Edge:** Bordered on the S, E, and N by Floodplain Cottonwood forest and on the W by hayland and agricultural land

**Topography:** Roughly circular; banks are steep and about 3 to 8 ft high; mean depth is approximately 3 ft. **Elevation:** 4790 ft. **Weather:** Mostly clear, dry, and warm. **Coverage:** May 6, 13, 23, 31; June 7, 13, 21; July 2; sunrise-0650 hours. Total man-hours: 4.5. **Census:** Yellow-headed Blackbird, 32 (377, 152); Com. Yellowthroat, 5 (59, 24); Red-winged Blackbird, 5; Am. Coot, 2; Brown-headed Cowbird (females), 2; Canada Goose, 1; Spotted Sandpiper, 1; W. Meadowlark, 1. **Total:** 8 species; 49 territorial males ( $577/\text{km}^2$ , 233/100 acres). **Remarks:** Yellow-headed Blackbirds declined from 45 territories in 1975. Common Yellowthroats, W. Meadowlarks, and Red-winged Blackbirds showed territorial numbers similar to 1975. Although one pair of Canada Geese and two pairs of Am. Coots set up territories early in the period, only one coot nest was found. The plot was established to evaluate the effects of the Fort St. Vrain Nuclear Generating Station on the surrounding environment. The pond will act as an intermediate holding location for blow-down water from the cooling towers when the plant becomes operative. Special thanks to Robert Stark for his assistance. — *HERMAN J. GRIESE, Dept. Fishery and Wildlife Biology, Colorado State Univ., Fort Collins, Colo. 80523.*

**150. DIKED COASTAL SALT MARSH.** — **Location:** California; Humboldt Co., 3 mi. S of Eureka, NW of State Hwy. 101 and SW of the King Salmon exit at the former Shipwreck tourist attraction (surrounding marsh is the plot); 40°44'N, 124°12'W, Fields Landing Quadrangle, USGS. **Continuity:** New. **Size:** 10.5 ha = 26 acres (irregular boundary follows physical barriers, averaging about 700 x 1600 ft; aerial photo with dot grid overlay.) **Description of Plot:** Diked salt marsh dominated by dense stands of invading 3 ft tall Bunch Grass (*Deschampsia cespitosa*). Lesser amounts of Rush (*Juncus lesueuri*), SpikeRush (*Eleocharis palustris*), Sedge (*Carex obnupta*), Water Celery (*Oenanthe sarmentosa*), and California Blackberry (*Rubus vitifolius*) are present. Herbaceous annuals are scattered throughout. Remnant populations of the original salt marsh species include: Cord Grass (*Spartina foliosa*), Pickleweed (*Salicornia virginica*), Salt Grass (*Distichlis spicata*), Saltbush (*Atriplex patula* ssp. *hastata*), and Gumweed (*Grindelia stricta* ssp. *blakei*). The marsh is divided by two gravel roads, a gravel parking lot, several buildings and a sewage oxidation pond. **Edge:** Bordered by a road, railroad embankment, tidal ditches and dikes which separate the marsh from the intertidal mudflat. **Topography:** Essentially flat. **elevation:** Sea level. **Weather:** Mild maritime climate. **Coverage:** May 28-29; June 1, 3, 7, 11, 15, 21; dawn-1100 or 1600-2000 hours. Total man-hours 20. **Census:** Long-billed Marsh Wren, 20 (190, 77); Savannah Sparrow, 5.5 (52, 21); Song Sparrow, 5 (48, 19); Mallard, 2 (females); White-crowned Sparrow, 0.5. **Total:** 5 species; 33 territorial males or females ( $314/\text{km}^2$ , 127/100 acres). **Visitors:** Black-crowned Night Heron, Cinnamon Teal, California Quail, Killdeer, Spotted Sandpiper, W. Meadowlark, Brewer's Blackbird, Brown-headed Cowbird, Am. Goldfinch, Lesser Goldfinch. **Remarks:** One female Mallard was observed incubating; another with 7 young was observed. Long-billed Marsh Wrens had the smallest territories and tended to occur around patches of brush in the continuous vegetation pattern. Birds with territories on

dikes around the plot and in habitats other than marsh were not included. Less than one Brown-headed Cowbird was averaged for each census. American and Lesser Goldfinches potentially nested after censusing was completed. — *PETER C. SORENSEN and PAUL F. SPRINGER, U.S. Fish and Wildlife Service, Humboldt State Univ., Arcata, Calif. 95521.*

**151. FRESHWATER MARSH-RIPARIAN WOODLAND.** — **Location:** California; Riverside Co., 15 mi SSE of the Mission-Riverview intersection, Santa Ana River Regional Park, Rubidoux; 33°59'N, 117°24'W, Riverside West Quadrangle, USGS. **Continuity:** New. **Size:** 9.3 ha = 23 acres (irregular, 700 x 1300 ft, determined by aerial photo and steel tape). **Description of Plot:** Freshwater marsh with associated open mature riparian woodland. Trees, 3 inches diameter and over, based on ten 0.1 acre circular samples, 0.7/acre, total basal area 1.6 square ft/acre. Species comprising 90% of the total number of trees: Fremont Cottonwood (*Populus fremontii*), 3, 39, 47, 2; dead trees, 3, 37, 47, 2; willow (*Salix spp.*), 2, 23, 6, 2. Trees by diameter size class A (3-6 in.) 2, 25, 8.1, 2; B (6-9 in.) none; C (9-15 in.) 3, 38, 36.7, 2; D (15-21 in.) 8, 12.5, 11.2, 1; E (21-27 in.) 8, 12.5, 24.4, 2. Shrub stems/acre, 315; ground cover 95%, canopy cover 8.5%; average canopy height 29 ft (range 18-33). Woodland 50%, seasonal marsh 35%, perennial marsh 15%. The area historically has been grazed. **Edge:** Pastureland and a sewage treatment plant border the plot to the W, more pastureland to the E, with ponds, marsh, and riparian woodland to the N and S. **Elevation:** About 730 ft. **Water:** Perennial water exists flowing from N to S; 10-40% of the flow is sewage effluent, depending on the season. **Weather:** High temperatures ranged from 65 to 100°F. Fog was common during the AM hours (Weather Bureau at Riverside Airport, about 2.5 mi from site). **Coverage:** March 27; April 3-4, 20, 24-25, May 8, 27; 0530-0830 hours (PST). Total man-hours 24. **Census:** Starling, 13 (140, 57); Red-winged Blackbird, 9 (97, 39); Song Sparrow, 6 (64, 26); Com. Flicker, 4 (43, 17); Mallard, 3 (32, 13); Cinnamon Teal, 3; Am. Coot, 3, Sora, 2; Com. Gallinule, 2; Mourning Dove, 2; Tree Swallow, 2; Long-billed Marsh Wren, 2; Com. Yellowthroat, 2; W. Meadowlark, 2; Rufous-sided Towhee, 2; Am. Bittern, 1; Red-shouldered Hawk, 1; Am. Kestrel, 1; Ring-necked Pheasant, 1; Rock Dove, 1; Spotted Dove, 1; Black-chinned Hummingbird, 1; Nuttall's Woodpecker, 1; Ash-throated Flycatcher, 1; Barn Swallow, 1; Cliff Swallow, 1; Com. Bushtit, 1; House Wren, 1; Bewick's Wren, 1; House Sparrow, 1; House Finch, 1. **Total:** 31 species; 73 territorial males, ( $784/\text{km}^2$ , 317/100 acres). **Remarks:** Tree, Barn, and Cliff Swallows were observed in large numbers over adjacent water, but few nest sites were found. —

**152. OPEN FIELD.** — **Location:** New York, Chautauqua Co., Erie Lake Plain; 1 mi. E of Rte 5, Fredonia Airport Property; 42°26'34"N, 79°23'17"W, Brocton Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 13 ha = 32 acres (rectangular, planimetered) **Description of Plot:** See AB: 29:1138-1139 (1975). Staghorn Sumac (*Rhus typhina*) increasing in plot. **Coverage:**

May 21, 24, 27; June 9, 13, 20-21, 24, 26; 0545-0900 hours and 2 trips 1930-2130 hours. Total man-hours: 14. **Census:** Henslow's Sparrow, 14 (108, 44); Red-winged Blackbird, 13 (100, 41); Dickcissel, 4 (31, 13); Savannah Sparrow, 4; Bobolink, 3 (23, 9); Grasshopper Sparrow, 3; E. Meadowlark, 2.5; Killdeer, 0.5; Upland Sandpiper, 0.5. **Total:** 9 species; 44.5 territorial males ( $344/\text{km}^2$ , 139/100 acres). **Remarks:** Nests or young observed for all species except Dickcissel. This census was funded as part of a larger study by Niagara Mohawk Power Corporation. — *ROY S. SLACK and CATHIE A. BAUMGARTNER, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**153. VINEYARD III.** — **Location:** New York; Chautauqua Co., Erie Lake Plain, 0.5 mi. N of Van Buren Rd on Fredonia Airport property;  $42^\circ 26' 35''\text{N}$ ,  $79^\circ 23' 16''\text{W}$ , Brocton Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 4.05 ha = 10 acres (irregular, planimetered). **Description of Plot:** The vineyards are composed of rows of the Concord variety of commercial grapes (*Vitis sp.*) on single strung wires stretched between wooden poles, placed in rows approximately 9 ft apart. Vegetative growth of the grapes reduces the distance between the rows to about 5.5 ft at shoulder height, and reaches a height of approximately 6.6 ft. The dominant herbaceous plants include Broad-leaved Plantain (*Plantago major*), *Aster* spp., Velvet Grass (*Holcus lanatus*), Chickory (*Cichorium intybus*), and Dandelion (*Taraxacum officinale*). **Edge:** Surrounded by shrub areas. **Topography:** Flat. **Elevation:** 635 ft. **Coverage, 1975:** May 16, 18, 20; June 6, 9, 11, 13, 20; between 0600 and 0900 hours. Total man-hours: 8.5. **Census, 1975:** Song Sparrow, 5 (124, 50); Field Sparrow, 2; Am. Robin, 1; Red-winged Blackbird, 0.5, Indigo Bunting, 0.5. **Total:** 5 species; 9 territorial males ( $222/\text{km}^2$ , 90/100 acres). **Coverage, 1976:** May 23-24, 26-27; June 9, 12, 20, 22; 0700-0900 and 1 evening 2030-2130 hours. Total man-hours: 9. **Census, 1976:** Song Sparrow, 8.5 (210, 85); Field Sparrow, 1.5; Yellow Warbler, 1; Am. Robin, 0.5. **Total:** 4 species; 11.5 territorial males ( $284/\text{km}^2$ , 115/100 acres). **Remarks:** Funded by Niagara Mohawk Power Corporation as part of a larger study. Vincent J. Lucid, Paul G. Kalka, and Harry E. Slack, III assisted in the censuses. Joseph McMullen provided vegetative information. — *CATHIE A. BAUMGARTNER and ROY S. SLACK, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**154. VINEYARD IV.** — **Location:** New York; Chautauqua Co., Erie Lake Plain, 0.6 mi. SW of East Middle Rd RR bridge trestle;  $42^\circ 31' 47''\text{N}$ ,  $79^\circ 13' 04''\text{W}$ , Silver Creek Quadrangle, USGS. **Continuity:** New. **Size:** 5.26 ha = 13 acres (rectangular, paced). **Description of Plot:** Vineyard structure same as Census 153. Chickory (*Cichorium intybus*), Ragweed (*Ambrosia artemisiifolia*), and Bindweed (*Convolvulus sepium*) were the most common herbaceous plants. Wild Carrot (*Daucus carota*), Broad-leaved Plantain (*Plantago major*), Dandelion (*Taraxacum officinale*), Wood Sorrel (*Oxalis europaea*), Quack Grass (*Agropyron repens*) and Italian Rye Grass (*Lolium multiflorum*) were also present. **Edge:** Bordered on three sides by shrubs, other side by newly established vineyard. **Topography:** Slight slope. **Elevation:** 700 ft.

**Coverage:** May 20-23; June 7, 10, 16, 19, 23; 0600-0730 hours. Total man-hours: 7.5. **Census:** Field Sparrow, 3 (57, 23); Red-winged Blackbird, 1.5; Savannah Sparrow, 1.5; Song Sparrow, 1.5; E. Kingbird, 1; Brown-headed Cowbird, 1; Grasshopper Sparrow, 1; Vesper Sparrow, 0.5. **Total:** 8 species; 11 territorial males ( $209/\text{km}^2$ , 85/100 acres). **Remarks:** This census was funded by Niagara Mohawk Power Corporation as part of a larger study. Joseph M. McMullen provided the description of the vegetation. — *ROY S. SLACK, Terrestrial Environmental Specialists, Inc., 8398 Oswego Road, Liverpool, N.Y. 13088.*

**155. OLD FIELD.** — **Location:** Pennsylvania, Schuylkill Co., 1 mi. SW of the village of Weishample,  $40^\circ 41' \text{N}$ ,  $76^\circ 27' \text{W}$ , Tremont Quadrangle, USGS. **Continuity:** Established 1974; 3 consecutive years. **Size:** 7.11 ha = 17.58 acres (basically square, 850 ft N-S 900 ft E-W, delineated by wooden stakes into 16 plots each measuring 170 ft N-S x 180 ft E-W using compass and steel tape). **Description of Plot:** See AB 28:1053 (1974) **Weather:** Cool to moderately warm with temperatures  $52^\circ$ - $72^\circ\text{F}$ . Most count days were clear with some early morning haze. **Coverage:** May 24; June 3, 10, 18-19, 22, 24, 29; 0545-0900 hours. Total man-hours: 8.5. **Census:** Field Sparrow, 15 (211, 85); Com. Yellowthroat, 5 (70, 28); House Wren, 4 (56, 23); Indigo Bunting, 3 (42, 17), Cardinal, 2; Rufous-sided Towhee, 2; Gray Catbird, 1, Wood Thrush, 1; E. Bluebird, 1; Blue-winged Warbler, 1; Yellow Warbler, 1; Yellow-breasted Chat, 1; Am. Goldfinch, 1; Song Sparrow, 1; Yellow-billed Cuckoo, +, Tufted Titmouse, +; N. Oriole, +; Scarlet Tanager, +. **Total:** 18 species; 39 territorial males or females ( $548/\text{km}^2$ , 222/100 acres). **Visitors:** Am. Woodcock, Com. Flicker, Blue Jay, Black-capped Chickadee, Cedar Waxwing, Red-eyed Vireo, Brown-headed Cowbird, Chipping Sparrow. — *ROLAND BERGNER, William Penn Memorial Museum, Box 1026, Harrisburg, Pa 17120.*

**156. ABANDONED FIELD.** — **Location:** Maryland, Prince Georges Co., Accokeek, Piscataway Park, Potomac River, 3 mi. W intersection of Rte 210 and Bryan Pt Rd;  $38^\circ 41' \text{N}$ ,  $77^\circ 4' \text{W}$ , Mt. Vernon Quadrangle, USGS. **Continuity:** Established 1972; 5 consecutive years. **Size:** 6.07 ha = 15.0 acres (irregular parallelogram, delineated by steel stakes into one-half acre plots using steel tape). **Description of Plot:** See AB 26: 995-996 (1972). **Weather:** The summer was cool and dry. **Coverage:** April 29; May 3, 6, 10, 18, 23, 27; June 3, 7, 19; July 2; 0710-1045 and 1445-1640 hours. Total man-hours: 22.75. **Census:** Field Sparrow, 5 (82, 33); Com. Yellowthroat, 3 (49, 20); Indigo Bunting, 3; Cardinal, 2, Blue Grosbeak, 2; Song Sparrow, 2; Bobwhite, 1; Carolina Wren, 1; Yellow-breasted Chat, 1; E. Meadowlark, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1; Orchard Oriole, +. **Total:** 13 species; 23 territorial males or females ( $379/\text{km}^2$ , 153/100 acres). **Remarks:** Nest found Field Sparrow, 1. The total number of birds and most species populations remained constant. Three species — E. Meadowlark, Orchard Oriole, and Rufous-sided Towhee — were new this year. — *LEONARD TEUBER and M. KATHLEEN KLIMKIEWICZ (compiler), 13117 Larchdale Rd., No. 2, Laurel, Md. 20811.*

**157. ABANDONED TURF FIELD.** — **Location:** Maryland; Montgomery Co., McKee-Beshers Wildlife Management Area; 39°04'32"N, 77°23'18"W, Sterling Quadrangle, USGS. **Continuity:** Established 1975. **Size:** 6.3 ha = 15.6 acres. **Description of Plot:** See AB 29: 1140-1141 (1975). **Coverage:** May 21, 28; June 18, 25, 30; July 9, 16, 23, 27; August 2; 0820-1245. Total man-hours 4.2. **Census:** Field Sparrow, 7 (111, 45); Grasshopper Sparrow, 4 (63, 26); E. Meadowlark, 1; Red-winged Blackbird, 1; Song Sparrow, 1. **Total:** 5 species; 14 territorial males (222/km<sup>2</sup>, 90/100 acres). **Remarks:** Nests found: Red-winged Blackbird, 2; Field Sparrow, 4; Song Sparrow, 1. — PAUL W. WOODWARD, 2433 Southgate Sq., Reston, Va. 22091.

**158. GRASSLAND.** — **Location:** North Carolina; Wilkes Co., border of North Wilkesboro. **Continuity:** Established 1974; 3 consecutive years, but censused for 11 years before as a cornfield. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 28: 1005 (1974). Change has been the clearing of the four acres, adjoining abandoned river channel, of Box Elder (*Acer negundo*) and Com. Elder (*Sambucus canadensis*), plowing the tract, and planting Soy Beans as a part of fifty acres. **Coverage:** April 11, 15, 25, 30; May 5, 9, 13, 20; June 10, 15, 18. Total man-hours: 25. **Census:** Song Sparrow, 5 (12, 5); Bobwhite, 3 (7, 3); Cardinal, 3; Mourning Dove, 2; Carolina Wren, 2; Indigo Bunting, 2; Am. Kestrel, 1; Com Flicker, 1; Com. Crow, 1; Carolina Chickadee, 1; House Wren, 1; Mockingbird, 1; Gray Catbird, 1; Am. Robin, 1; Yellow-breasted Chat, 1; E. Meadowlark, 1; Com Grackle, 1. **Total:** 17 species; 28 territorial males (69/km<sup>2</sup>, 28/100 acres). — WENDELL P. SMITH, North Wilkesboro, N. C. 28659.

**159. BLUEGRASS - TIMOTHY - CLOVER OLD PASTURE.** — **Location:** Illinois; McLean Co., Moraine View State Park, 3 mi. S Ellsworth, T23N, R4E, SE<sup>1/4</sup>, Sec 34; 40°24' N, 88°44' W, Arrowsmith 15' Quadrangle, USGS. **Continuity:** New. **Size:** 14.16 ha = 35 acres. **Description of Plot:** A rectangle, without woody vegetation, in center of 80 ha old pasture, much of which is succeding to shrubland. Dominant species are Kentucky Blue Grass (*Poa pratensis*) 43% (per cent occurrence based upon 112 points taken at random through center of plot), White Clover (*Trifolium repens*) 19%, Red Clover (*T. pratense*) 14%, Yellow Sweet Clover (*Melilotus officinalis*) 5%, Timothy (*Phleum pratensis*) 4%, Meadow Fescue (*Festuca elatior*) 3%, Alsike Clover (*T. hybridum*) 3%, Whorled Milkweed (*Asclepias verticillata*) 3%, thistles and wild lettuce <1%. Average height 18 in.; vegetation sparse to moderately dense with sparse to medium litter. **Topography:** Gently rolling. **Coverage:** June 14, 16, 18, 22, 27; Total man-hours: 8. All counts made in early morning. **Census:** Red-winged Blackbird, 10 (71, 29); Dickcissel, 7 (49, 20); E. Meadowlark, 4 (28, 11); Upland Sandpiper, 1; Savannah Sparrow, 1; Grasshopper Sparrow, 1. **Total:** 6 species; 24 territorial males (169/100 ha, 69/100 acres). — DALE E. BIRKENHOLZ, Ill State Univ., Normal, Ill. 61761.

**160. GRASS - SEDGE MEADOW.** — **Location:** Illinois; Lake Co., SE corner of Chain O'Lakes State Park, 42°27' N, 88°10' W, Fox Lake Quadrangle, USGS.

**Continuity:** New. **Size:** 5.9 ha = 14.6 acres (rectangular, measured with planimeter). **Description of Plot:** Inland fresh meadow, characterized by four vegetational zones. The first zone (15 m wide), dominated by Narrow-leaved Cattail (*Typha angustifolia*), borders the lake and consists of floating mats of cattails. The second zone (25 m wide) is dominated by Reed Grass (*Phragmites communis*), with large tussocks formed by Blue-joint Grass (*Calamagrostis canadensis*) and a sedge (*Carex* sp.) The third and largest zone (100 m wide) is a grass-sedge meadow. The most abundant plants are Blue-joint Grass and a *Carex* sp.. The fourth zone (50 m wide) is characterized by several willow species and an umbel (*Angelica atropurpurea*). The dominant plants are Mountain Mint (*Pycnanthemum* sp.), a *Carex* sp., and Joe Pye Weed (*Eupatorium maculatum*). **Edge:** Surrounded on two edges by similar habitat; E edge bounded by water; W by an upland deciduous forest. **Topography:** Gently sloping W. **Elevation:** 730 ft **Coverage:** June 25-29; July 1; 0500-1000 hours. Total man-hours: 8. **Census:** Swamp Sparrow, 15 (254, 103), Com. Yellowthroat, 6 (102, 41); Short-billed Marsh Wren, 3 (51, 21); Red-winged Blackbird, 1.5; Willow Flycatcher, 1; Gray Catbird, 1; Com. Grackle, 1; Long-billed Marsh Wren, +; Am. Goldfinch, +. **Total:** 9 species; 28.5 territorial males (482/km<sup>2</sup>, 195/100 acres) **Remarks:** Swamp Sparrows and Com. Yellowthroats were evenly distributed in all zones. Short-billed Marsh Wrens occurred only in the grass-sedge zone. The Willow Flycatcher and Gray Catbird were restricted to the willow-umbel section of the marsh. The Long-billed Marsh Wren was observed only in the cattail zone — RANDALL MADDING (compiler) and WILLIAM MCCLAIN, R.R. 2, WAPORA, Inc. 61920.

**161. ORCHARD GRASS - TALL FESCUE MEADOW.** — **Location:** Illinois; McLean Co., 6 mi S Gridley; T25N, R3E, SE 1/4, NW 1/4, Sec 5; 40°40' N, 88°54' W, Normal Quadrangle, USGS. **Continuity:** New. **Size:** 12.14 ha = 30 acres, (rectangular, determined by aerial photo). **Description of Plot:** Part of an 80-acre former pasture, now converted to a sanctuary. A small stream runs across one end. Three-fourths of the plot is rolling upland dominated by Orchard Grass (*Dactylis glomerata*) and Timothy (*Phleum pratensis*), with few forbs. The S one-fourth borders the stream and is dominated by Blue Grass (*Poa pratensis*), Redtop (*Agrostis alba*), Tall Fescue (*Festuca elatior*), and Smooth Brome (*Bromus inermis*). Forbs are more abundant here and are primarily Red Clover (*Trifolium pratense*), White Clover (*T. repens*), Fleabane (*Erigeron annuus*), and Bull Thistle (*Cirsium vulgare*). Ground cover is dense to a height of 12-18 in., with flowering stalks providing sparse cover to a height of 30-40 in. Two large oak trees are present near the stream. **Topography:** Rolling to nearly level along stream. **Edge:** Bordered on 3 sides by highway or lane and on one side by 20 ha of similar habitat that grades into open parkland. The tract lies between intensively cultivated land and an extensive area of Mackinaw River valley woodland and shrubland. **Coverage:** May 10, 25; June 15-18, 20-21, 26; early mornings. Total man-hours: 7. **Census:** Red-winged Blackbird, 18 (148, 60); Dickcissel, 6 (49, 20); E. Meadowlark, 4 (33, 13); Bobolink, 2; Com. Yellowthroat, 1. **Total:** 5 species,

31 territorial males ( $255/\text{km}^2$ , 103/100 acres). **Remarks:** Plans are to manage the census plot as grassland. Thus, it should provide an opportunity to monitor a habitat that is becoming increasingly uncommon here. Also, this type of grassland, mostly of introduced forage grasses, is the most common type now found in this area. Red-wings and meadowlarks utilized all parts of the area; the Dickcissels were limited mostly to the periphery where fences, trees, or utility lines provided perches. A total of 33 female red-wings were associated with the males (range 1 to 4 per male). —DALE E. BIRKENHOLZ, Ill. State Univ., Normal, Ill. 61761.

**162. ADVANCED OLD FIELD.** — **Location:** Indiana; Spencer Co., 2 mi. NE of Rockport;  $37^\circ 54' \text{N}$ ,  $87^\circ 01' \text{W}$ , Rockport Quadrangle, USGS. **Continuity:** New. **Size:** 8.5 ha = 21 acres (irregular rectangle, measured with a steel tape). **Description of Plot:** The most abundant trees were saplings and seedlings of Red Maple (*Acer rubrum*), Sweet Gum (*Liquidambar styraciflua*), and Am. Elm (*Ulmus americana*); no large trees were present. The dominant herbaceous vegetation was Goldenrod (*Solidago* sp., 63%), Tall Fescue (*Festuca elatior*, 16%), Path Rush (*Juncus tenuis*, 13%), Aster sp., 3%, Indian Hemp (*Apocynum cannabinum*, 1%), and brome grass (*Bromus* sp., 1%). These six species comprised 97% of the herbaceous vegetation. The herbaceous vegetation was surveyed from 10 1-m<sup>2</sup> samples, randomly selected. **Edge:** Bordered on two sides by large deciduous trees and similar old fields; remaining two sides by old fields and cultivated fields. **Topography:** Flat. **Elevation:** 390 ft. **Weather:** Temperatures  $65^\circ$ - $85^\circ \text{F}$ . **Coverage:** June 4-5, 7-8, 15, 17, 22, 29-30; July 2; 0755-0930. Total man-hours 7.5. **Census:** Red-winged Blackbird, 7.5 (88, 36); Song Sparrow, 4 (47, 19); Com. Yellowthroat, 2; Cardinal, 2; Yellow-breasted Chat, 1; Field Sparrow, 1; Am. Robin, 0.5; Indigo Bunting, 0.5. **Total:** 8 species; 18.5 territorial males ( $218/\text{km}^2$ , 88/100 acres). **Remarks:** Nests found: Red-winged Blackbird, 4; Am. Robin, 1. This is part of a continuing study to investigate and monitor the environmental conditions in the vicinity of a proposed power plant in the American Electric Power system. — JOHN BELL, RANDALL COOLEY, WILLIAM MCCLAIN, RANDALL MADDING, R.R. 2, WAPORA, Inc., Charleston, Ill. 61920.

**163. ANNUAL GRASSLAND.** — **Location:** California; Riverside Co., 2.2 mi. N of Lakeview P. O. on E side of Davis Road;  $33^\circ 52' \text{N}$ ,  $117^\circ 7' \text{W}$ , Perris Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (trapezoidal, paced). **Description of Plot:** The dominant plant is Filaree (*Erodium* sp.), which comprises the major ground cover. Six Olive Trees (*Olea europaea*) and 2 Pepper Trees (*Schinus molle*) are present on the W side. A dirt road approximately 10 ft wide runs in an E-W direction through the S half; the E half contains a barbed-wire fence which runs in a NE-SW direction. A dry creek bed runs parallel to the fence on the W side. The soil is sandy and many California Ground Squirrel (*Spermophilus beecheyi*) and Burrowing Owl burrows are present. A quantitative line-point survey of the vegetation gave the following results: Filaree 45%; bare ground 25%, litter 22%; Red Brome Grass (*Bromus rubens*) 6%; Heronbill (*Erodium sicutarium*) 2%. Total ground cover

53%. **Edge:** Bordered on the S and E by similar habitat, on the N by Coastal Sage Scrub Community, and on the W by Davis Road, a 30 ft wide dirt road. Cultivated fields are present on the W side of Davis Road. **Topography:** Essentially flat but sloping downhill from N to S. **Elevation:** 1450 ft. **Weather:** Mainly overcast throughout census period. **Coverage:** May 8, 10, 16, 21, 23-31; 0900-1130 or 1645-1800 hours. Total man-hours: 20. **Census:** Burrowing Owl, 4 (49, 20); W. Meadowlark, 4; Loggerhead Shrike, 2; Am. Kestrel, +. **Total:** 4 species; 11 territorial males or females ( $136/\text{km}^2$ , 55/100 acres) **Visitors:** Mourning Dove, Anna's Hummingbird, Starling, Yellow Warbler, Brewer's Blackbird, Red-winged Blackbird. **Remarks:** Seven burrows of Burrowing Owls were found and some of the owl pairs appeared to be fledging young. Starlings were numerous on the plot at the beginning of the census and appeared to be nesting. The Starling population showed a substantial decrease in numbers from May 28 until the end of the census. Special thanks to Vernon Bleich for aiding in the vegetational analysis and field observations. — KATHLEEN M. BLEICH, Dept. Biol., Calif. State Univ., Long Beach and P. O. Box 1741, Hemet, Calif. 92343.

**164. DRY GRASS FIELD.** — **Location:** California, Orange Co., Costa Mesa, a portion of Fairview Regional Park;  $33^\circ 39' \text{N}$ ,  $117^\circ 57' \text{W}$ , Newport Beach Quadrangle, USGS. Bordered to the W by the Greenville-Banning Channel and to the S by a dirt road and telephone lines, bordered to the E by two dirt roads (separated by a dry creek) and a high bluff. There is a small dirt road on the N edge of the field. **Continuity:** New. **Size:** 13.3 ha = 32.9 acres (quadrangular plot, paced). **Description of Plot:** Once part of a salt-marsh floodplain before the Santa Ana River Channel was cut through, this section now remains mostly dry except during rainfall periods. There are no trees. The area is almost completely covered by foot-high grass (*Hordeum* sp.) interspersed with a few common weeds. On the W edge of the field Pigweed (*Chenopodium* sp.) occurs as many large (3-5 ft tall), dense bushes which grow close together. The field is bordered on the W and E for most of its length by smaller Pigweed bushes. Indian Tobacco (*Nicotiana glauca*) stands out as the only few tall plants (about 8 ft) Shrub stems/acre 1780; ground cover 100%. **Edge:** The field extends N and S beyond the dirt road boundaries. There are bamboo thickets in the small, dry creek-bed along the E side. **Topography:** Flat. **Elevation:** Just above sea level. **Weather:** Generally overcast and cool. **Coverage:** May 12, 14, 17-18, 20-23; 0730-0930 hrs. Total man-hours: 15. **Census:** W. Meadowlark, 4 (30, 12) **Total:** 1 species; 4 territorial males or females ( $30/\text{km}^2$ , 12/100 acres). **Visitors:** White-tailed Kite, Am. Kestrel, Mourning Dove, Anna's Hummingbird, Loggerhead Shrike. **Remarks:** Observations were made from a high channel bank along the W edge of the field. The number of meadowlark territories detected is probably a minimum. The Loggerhead Shrikes could have been nesting in the study area but it could not be confirmed. — JOHN G. FRAZIER, Dept. Biol., Calif. State Univ., Long Beach, and 7890 Ring St., Long Beach, Calif. 90808

**165. URBAN GRASS FIELD.** — **Location:** California; Los Angeles Co., Torrance, N side of Sepulveda Blvd., bounded by Maple Ave. to the W, Monterey and

Toledo Streets to the N, and Crenshaw Blvd. to the E; 33°49'30"N, 118°20'W, N. Torrance Quadrangle, USGS. **Continuity:** New. **Size:** 46.54 ha = 115 acres (irregular trapezoid, dimensions measured from scaled USGS map). **Description of Plot:** Typical urban grassy field consisting of Wild Oat (*Avena fatua*), 80%; Bermuda Grass (*Cynodon dactylon*), 15%; Com. Foxtail (*Hordeum leporinum*), 5%. The E and W boundaries are lined with Eucalyptus trees, with more elsewhere on the plot. Average tree height about 60 ft. An asphalt and dirt road loops through the field servicing 17 oil pumps. Railroad tracks run along the N portion of the field in a general E-W direction. Many telephone poles are on the plot. Recently, 10.1 ha = 25 acres have been planted with Strawberries (*Fragaria* sp.) or are being prepared for planting. **Edge:** Bordered on the N, S, and E by residential, industrial, and commercial property. To the W are 54 acres of open grass and marsh land (Madrona Marsh). **Topography:** Flat, edge raised slightly. **Elevation:** 90 ft. **Weather:** Generally warm and clear. **Coverage:** May 2, 8-9, 27-31; 0530-0730 hrs. Total man-hours: 16. **Census:** W Meadowlark, 11 (24, 10); Loggerhead Shrike, 4 (9, 3); Am. Kestrel, 2; Anna's Hummingbird, 1. **Total:** 4 species; 18 territorial males or females (39/km<sup>2</sup>, 16 per 100 acres). **Visitors:** Mourning Dove, Com. Crow, Starling, House Finch. **Remarks:** Three Loggerhead Shrike nests were located. — DAVID C. ROELEN, 24211 Adolph Ave., Torrance, Calif. 90505.

**166. URBAN RESIDENTIAL. — Location:** New Jersey, Passaic Co., Prospect Park, NE of Haledon Ave. between 10th and 13th Streets; 40°52'N, 74°07'W, Paterson Quadrangle, USGS. **Continuity:** New. **Size:** 8.9 ha = 22 acres (rectangle, mapped from town tax assessment map). **Description of Plot:** Part of a town established in 1901. There are approximately 180 houses in the plot (20 2/ha), most of 1, 2, or 3 stories. Other buildings include a portion of a warehouse, several small stores, a church, firehouse, a used car lot, and a furniture shop. Sugar Maples (*Acer saccharum*), Red Maples (*A. rubrum*), and Silver Maples (*A. saccharinum*) 20 to 55 ft tall, 7 per acre are the dominant trees along several of the streets. The houses have many shrubs and hedges about them and small lawns in the back yards. **Edge:** Bordered all sides by similar dwellings. **Topography:** Flat. **Elevation:** 160-200 ft. **Coverage:** April 27; May 5, 11, 20, 25, 28, June 5; 0530-0700 hrs. Total man-hours: 10. **Census:** House Sparrow, 29 (326, 132); Starling, 17 (191, 77); Am. Robin, 4.5 (51, 20); Rock Dove, 2; Blue Jay, 1; Mockingbird, 1; Cardinal, 1; House Finch, 1; Song Sparrow, 1; Mourning Dove, +; Com. Nighthawk, +; Chimney Swift, +. **Total:** 12 species; 57.5 territorial males (646/km<sup>2</sup>, 261/100 acres). **Remarks:** The nest location of nearly all House Sparrows, Starlings, and Am. Robins were determined. House Sparrows and Starlings nested almost exclusively in the attic air vents, under eaves, in roof overhangs, and in openings where wood was rotted. Many old nest sites are no longer available to the latter two species due to the re-siding of houses with aluminum. The older two-story and three-story houses appear to support more nesting House Sparrows and Starlings than the newer single family houses. — JAMES J de WAAL MALEYFT, 84 N. 12th St., Prospect Park, NJ 07508.

**167. URBAN RESIDENTIAL. — Location:** Ontario, Carleton Co., Ottawa, inner suburbs; bounded (clockwise from N corner) by Tara, ---, Gage, Navaho, ---, Cline, Sherman, ---, with corners rounded where dashes shown; 45°22'N, 75°45'W, map 31G/5, Ottawa, NTS. **Continuity:** New (for breeding birds). **Size:** 53.0 ha = 131 acres (irregular, roughly 700 m N-S x 650 m E-W, by dot grid on city map calibrated with measured rope) **Description of Plot:** City subdivision built 16-18 years ago. Most of western half of area described in *AFN*, 24:567-568 (1970), and *AB*, 29:787 (1975) but more accurate description now available. All single-family homes, 668 in number, except 3 doubles, with one school whose grounds and adjoining park occupies 6.4 ha (16 acres), two other small park areas total 1.1 ha (2.7 acres). Quantitative vegetation sampling (73 lots, or 10.9%) showed 364 trees and shrubs 3 m (10 ft) or taller; density 8/ha (3.2/acre) with park areas excluded. There were 64 hedges on 45 of the lots; 43 were of White Cedar (*Thuja occidentalis*), the others of various broad-leaved shrubs, all 1.3-4 m (4-12 ft.) high. Shrubs 1.5 to 3 m in height and less than 1.5 m high were each noted on about 70% of the lots, evergreens (mostly cedars and junipers) predominating in both height classes. Overall tree composition was maples, 19%; birches, 12%; apples and crabapples, 12%; ashes, 10%; cedars, 9%; lindens, 7%; spruces, 6%; pines, 5%; mountain-ashes, Black Locust, and unidentified or dead trees, each 3%; others (10 tree and 3 tall shrub species) 14%. The density of trees was roughly comparable front to back if the city plantings were excluded. **Edge:** Similar habitat on all sides. A vacant parkway right-of-way, one-half block away, extends around the W and N. High-rise apartments adjoin the SW corner, and areas of double homes border arterial streets to the S and at the NE corner. **Topography:** Nearly level. **Elevation:** 275 ft. **Weather:** Generally warm in June, cool in May and July, with frequent rains; most surveys were on cool, clear, still days, with temperatures 47°-65°F. **Coverage:** May 24, 29; June 2, 9, 12, 18, 21; July 4, 9, 15; 0450-0819 hrs., EDT. Total man-hours: 30. **Census:** House Sparrow, 70 (132, 53); Am. Robin, 18 (34, 14); Starling, 15.5 (29, 12); Chipping Sparrow, 7.5 (14, 6); Song Sparrow, 7.5; Purple Martin, 5 (9, 4); Am. Goldfinch, 5; Tree Swallow, 4 (8, 3); Com. Grackle, 4; N. (Baltimore) Oriole, 3 (6, 2); Brown-headed Cowbird, 3 (females; plus est 5 males); Cedar Waxwing, 2; Rock Dove, 1; Red-winged Blackbird, 1; Blue Jay, 0.5; Black-capped Chickadee, 0.5; Killdeer, +. **Total:** 17 species; 147.5 territorial and non-territorial males (278/km<sup>2</sup>, 113/100 acres) **Remarks:** This area of crescent streets without lanes was awkward for surveys; lack of through streets made coverage of a smaller area inconvenient. The density found is low for an urban area; the scarcity and small size of trees probably lowered the densities of robins and several other species. Only 2 nests of robins and 3 of Starlings were found; surveys for these species should have started 2-3 weeks earlier. Young of these species and House Sparrows were commonly flying by mid-June. Most Starlings left the area before July 1, so could only have reared one brood, but other species were still on territory in mid-July. Cedar Waxwings were seen only on the last 4 surveys, but late July observations confirmed that these were on territory; goldfinches were in the same areas from the start. All species were evenly distributed except Red-wings, of which parts of several territories

extended onto the area from the nearby parkway. The clusters of Starlings and grackles were vague, owing to a scarcity of "song" registrations and the high mobility of these species, which were noted regularly and clearly bred on the area. Cats were few (only 3 or 4/survey) and dogs almost all chained. — *ANTHONY J. ERSKINE, Migratory Birds Branch, Canadian Wildlife Service, Ottawa, Canada K1A OH3.*

**168. VILLAGE RESIDENTIAL.** — **Location:** Ohio, Wyandot Co., on the W edge of Carey; 40°57'N; 83°23'15"W; Upper Sandusky Quadrangle, USGS. **Continuity:** New. **Size:** 12.95 ha = 32 acres (quadrilateral; measured by odometer, pacing, and village map interpretation). **Description of Plot:** West St. forms the E boundary; Findlay St., the N; Muncie St., the W; and the S margin is adjacent to a large, well-kept, grassy, area and a small orchard, both of which are bordered by a railroad. The area includes a portion of Clay St. (about 900 ft) and Spring Run (about 900 ft), the latter bordered by a narrow strip of vegetation, a few trees, or by grassy lawns. The house lots are large, away from the street by 25 ft, with well-kept lawns. There are few hedges, and shrubbery is composed of those species typically found around homes. Genera include: *Juniperus*, *Tsuga*, *Taxus*, *Euonymus*, *Cornus*, *Crataegus*, *Forsythia*, *Lonicera*, *Syringa*, *Rosa*, *Spiraea*, and *Vitis*. Nearly every lot has some kind of vegetation, shrubbery being more frequent than trees. Only along Spring Run is there any density of shrubbery. There are two schools and several large buildings. The streets are lined with mature Silver Maple (*Acer saccharinum*), with a few Chinese Elm, *Catalpa speciosa*, Boxelder (*Acer negundo*), Norway Maple (*A. platanoides*), Sugar Maple (*A. saccharum*), Red Maple (*A. rubrum*), Black Maple (*A. nigrum*), Horse Chestnut (*Aesculus hippocastanum*), Norway Spruce (*Picea abies*), Siberian Crab (*Pyrus* sp.), and Redbud (*Cercis canadensis*). Off-street tree vegetation consists of species previously mentioned and in addition, White Ash (*Fraxinus americana*), Red Cedar (*Juniperus virginiana*), Red Mulberry (*Morus rubra*), and Apple (*Pyrus malus*). **Weather:** An early spring and a dry August. **Coverage:** Almost daily, from a few minutes to two hours, before 0800, and after 1800. The compiler has lived in the area since 1969. Total observer-hours: 113. **Census:** House Sparrow, 12 (93, 38); Am. Robin, 10 (77, 31); House Wren, 8 (62, 25); Starling, 6 (46, 19); Com. Grackle, 6; Song Sparrow, 6; Mourning Dove, 4 (31, 13); Cardinal, 4; Chipping Sparrow, 4; Gray Catbird, 3 (23, 9); Com. Flicker, 2; Blue Jay, 2; Carolina Wren, 2; Screech Owl, 1; Downy Woodpecker, 1; Tufted Titmouse, 1; Warbling Vireo, 1; Yellow Warbler, 1; Brown-headed Cowbird, 1; and Am. Goldfinch, 1. **Total:** 20 species; 76 pairs (587/km<sup>2</sup>, 238/100 acres). **Remarks:** Observed since 1969, the area has undergone little change. Minor storm damage has occurred to the large trees. Moderate to heavy traffic is common on Findlay St. which is an E-W main artery of travel. The tree vegetation was compiled to street-edge miles. The street-edge distance of 8448 ft (1.6 mi.) contained a total of 125 mature trees, equivalent to 78+ trees per street-edge mile. Off-street trees were frequent enough to provide numerous nesting sites. Daily visitors included those species nesting in the village. Street-edge trees are more important to hole-nesting birds since Silver Maple is more subject to storm damage

and resulting cavity development. The existence of a 12-20 pair concentration of grackles in a pine plantation within 0.3 of a mile probably reduced the in-village population. The mammal predation normally associated with residential areas prevailed as cats and dogs were much in evidence. A comparison of this census with the only other known residential effort in Ohio (4B 25 994) by Dr. Elliot J. Tramer indicates: a higher density (238 vs. 150/100 acres); the species are about equal (20 vs 19); a smaller census acreage sample (32 vs. 43.4); two species in common among the three most abundant (House Sparrow, Am. Robin). The grackle occurred as the second most abundant in Dr. Tramer's census, while the House Wren was third in the Carey census, with the grackle tied in fourth place. — *A. H. CLAUGUS, 228 S Lake St., Carey, Ohio 43316.*

**169. MATURE TULIP - TREE - OAK FOREST.** — **Location:** Maryland; Prince Georges Co., 6 mi. N of Upper Marlboro; 38°53'45"N, 76°45'46"W, Lanham Quadrangle, USGS. **Continuity:** Censused once previously in 1947. See AFN 1:211-212 (1947). **Size:** 14.6 ha = 36 acres. **Description of Plot:** The original, irregularly shaped tract has changed little in gross appearance in the last 28 years, and has suffered little apparent disturbance. The dominant overstory trees remain: Tulip-tree (*Liriodendron tulipifera*), White Oak (*Quercus alba*), Pignut Hickory (*Carya glabra*), and Black Oak (*Q. velutina*). The understory and shrub layers are still sparse and consist largely of Flowering Dogwood (*Cornus florida*) and Spicebush (*Lindera benzoin*). Poison Ivy (*Rhus radicans*) occurs in patches in the E and W sections. The forest floor is largely open, and is covered with a deep layer of leaves and humus. Dominant herbs include May-apple (*Podophyllum peltatum*), Jack-in-the-Pulpit (*Arisaema triphyllum*), and several ferns. **Edge:** The plot boundaries were drawn as nearly as possible to the 1947 boundaries. The E boundary of the plot is within the tract and is separated from Church Road, a 2-lane black-top that carries relatively light traffic, by a narrow strip of forest 30-160 ft wide. The N boundary lies partly within the tract and excludes a portion of the tract that has a lower tree density, and which supports a recent overgrowth of Poison Ivy and Bush Honeysuckle (*Lonicera tatarica*). A total of 1850 ft of plot perimeter on the N and W adjoins open fields that have been cultivated annually for many years. At the NW corner of the plot, and exterior to it, a small area of field (about 0.2 acres) has reverted to early second growth dominated by Black Locust (*Robinia pseudoacacia*), Red Maple (*Acer rubrum*), and Tulip-tree. A similar area of about 0.7 acres adjoins the SW corner of the plot. The S boundary of the plot is about 50 ft from Maryland Route 214, a busy 2-lane highway. The area between the highway and the forest tract is occupied by a powerline and a variety of shrubs and trees, especially Black Locust and Devil's-walking-stick (*Aralia spinosa*). **Topography and Elevation:** The elevation varies from 180 ft in the SE corner to 140 ft in the SW corner. These differences generate significant variability in retained moisture and, concomitantly, density of shrub cover. **Coverage 1975:** May 14, 20-23, 25-27, 29; June 4, 11, 18, 23. Total: 13 trips between 0520 and 1100; 31 observer-hours. **Census:** Wood Thrush, 38 (260, 106); Red-eyed Vireo, 36 (247, 100); Cardinal, 95 (65, 26); Ovenbird, 95; E. Wood

Pewee, 8.5 (58, 24); Red-bellied Woodpecker, 7 (48, 19); Acadian Flycatcher, 6 (41, 17); Tufted Titmouse, 5.5 (38, 15); Downy Woodpecker, 5 (34, 14); Scarlet Tanager, 5; Carolina Wren, 4.5 (31, 13); Kentucky Warbler, 4 (27, 11); Carolina Chickadee, 3.5 (24, 10); White-breasted Nuthatch, 2.5; Blue Jay, 2; Brown-headed Cowbird, 2; Rufous-sided Towhee, 2; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; Starling, 1; Yellow-throated Vireo, 0.5; Barred Owl, +; Com. Flicker, +; Pileated Woodpecker, +; Com. Crow, +; Blue-gray Gnatcatcher, +; N. Parula, +. **Total:** 27 species; 154 territorial males ( $1055/\text{km}^2$ , 428/100 acres). **Coverage 1976:** May 28, 29; June 4, 10, 13, 15, 28. Total: 7 trips, between 0530 and 1100; 24 observer-hours. **Census:** Red-eyed Vireo, 30.5 (209, 85); Wood Thrush, 21 (144, 58); Red-bellied Woodpecker, 8 (55, 22); Cardinal, 8; Acadian Flycatcher, 7 (48, 19); Ovenbird, 7; Downy Woodpecker, 6 (41, 17); E. Wood Pewee, 6; Tufted Titmouse, 4.5 (31, 13); Carolina Wren, 4.5; Scarlet Tanager, 4 (27, 11); Blue Jay, 3; Starling, 3; Kentucky Warbler, 3; Brown-headed Cowbird, 3; White-breasted Nuthatch, 2.5; Carolina Chickadee, 2; Com. Flicker, 1; Hairy Woodpecker, 1; Yellow-throated Vireo, 1; Hooded Warbler, 1; Yellow-billed Cuckoo, +; Ruby-throated Hummingbird, +; Com. Crow, +. **Total:** 24 species; 127 territorial males ( $870/\text{km}^2$ , 353/100 acres).

**Remarks:** The significance of these censuses is discussed in an article in this issue on p. 17. — *BRUCE WHITCOMB, 10271 Windstream Drive, Columbia, Md. 21045, DANNY BYSTRAK, Patuxent Wildlife Research Center, Laurel, Md. 20710, ROBERT WHITCOMB (compiler), U.S. Dept. of Agriculture, ARS, PPI, Beltsville, Md. 20705.*

**170. SELECTIVELY LOGGED MATURE TULIP-TREE OAK FOREST.** — **Location:** Maryland; Prince Georges Co., 6.5 mi. N of Upper Marlboro;  $38^\circ 55' \text{N}$ ,  $76^\circ 45' 30'' \text{W}$ , Lanham Quadrangle, USGS. **Continuity:** New. **Size:** 14.2 ha = 35 acres. **Description of Plot:** The tract is located 0.5 mi. N of an undisturbed mature Tulip-tree-oak forest AFN 1:211-212 (1947); see AB 31:91-92; Census No. 169, and is comparable to it in every way with the exception of a selective logging operation conducted in 1971 for White Oak. As a result of this operation, there are numerous canopy breaks, beneath which a profusion of shrubby second growth has sprung up. Before the logging operation, Tulip-tree (*Liriodendron tulipifera*) comprised 53% and White Oak (*Quercus alba*) 39% of the dominant trees. Small trees in the understory include Black Gum (*Nyssa biflora*), Tall Pawpaw (*Asimina triloba*), Wild Cherry (*Prunus serotina*), Green Ash (*Fraxinus pennsylvanica*), Mockernut Hickory (*Carya glabra*), and Ironwood (*Carpinus caroliniana*). Dominant understory plants are Flowering Dogwood (*Cornus florida*), and Spicebush (*Lindera benzoin*). Beneath the canopy openings there is a profusion of Multiflora Rose (*Rosa multiflora*), Bush Honeysuckle, Muscadine Grape (*Vitis rotundifolia*), Fox-grape (*Vitis labrusca*), Virginia Creeper (*Parthenocissus quinquefolia*), Com. Greenbrier (*Smilax rotundifolia*), Wineberry (*Rubus phoenocolasius*), Wild Yam (*Dioscorea villosa* and *D. quaternata*). The following species were found in the remaining well-shaded parts of the forest floor: Partridge-berry (*Mitchella repens*), Solomon's Seal (*Polygonatum biflorum*), May-apple (*Podophyllum peltatum*), Bloodroot (*Sanguinaria canadensis*), Spotted Win-



Census 169. Mature Tulip-tree-oak forest. Note low density of vegetation in shrub and terrestrial zones.

tergreen (*Chimaphila maculata*), and Christmas Fern (*Polystichum acrosticoides*). **Edge:** The 53-acre tract containing the 35-acre plot is bounded on the N by a schoolyard, on the NW by an extensive seepage forest comprised of Pin Oak (*Quercus palustris*), Sweet Gum (*Liquidambar styraciflua*), Tulip-tree and Red Maple (*Acer rubrum*). On the NE corner, the tract is separated by the narrow width of Church Road from another extensive, wet forest. Most of the area along the E perimeter and across Church Road is open pasture. Most of the W side and all of the S side adjoin cultivated fields. Two dwellings occur inside the tract at the SW corner, but are not within the plot boundary. The census plot is entirely within the larger tract on its E, S, and W sides (Fig. 1). On the N boundary of the plot there is a sharp transition from forest interior to schoolyard lawn. This boundary is clearly of long standing since several oak trees approaching 48 in dbh had well-developed canopies extending into the adjacent open space. **Topography and Elevation:** The W edge of most of the tract lies close to a ridge (elev. 180 ft) separating the Collington and Black Branch Basins; from this ridge there is a gradual slope downward to Church Road (elev. 160 ft). **Coverage 1975:** May 14, 20-23, 25-27, 29; June 4, 11, 18, 23. Total: 31 observer-hours. **Census:** Wood Thrush, 23 (162, 66); Red-eyed Vireo, 22.5 (158, 64); Cardinal, 13 (92, 37); Hooded Warbler, 11 (77, 31); Red-bellied Woodpecker, 8 (56, 23); E. Wood Pewee, 7.5 (53, 21); Kentucky Warbler, 7 (49, 20); Rufous-sided Towhee, 7; Acadian Flycatcher, 6.5 (46, 19); Downy Woodpecker, 6 (42, 17); Scarlet Tanager, 6; Carolina Wren, 5.5 (39, 16); Indigo Bunting, 5.5; Carolina Chickadee, 4.5 (32, 13); Tufted Titmouse, 3.5 (25, 10); White-eyed Vireo, 3.5; White-breasted Nuthatch, 3

(21, 9); Brown-headed Cowbird, 3; Yellow-throated Vireo, 2.5; Mourning Dove, 2; Yellow-billed Cuckoo, 2; Corn. Flicker, 2; Great Crested Flycatcher, 2; Blue Jay, 2; Corn. Yellowthroat, 2; Ovenbird, 1.5; Hairy Woodpecker, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1; N. Oriole, 1; Red-tailed Hawk, +; Barred Owl, +; Pileated Woodpecker, +; Com. Crow, +; Brown Thrasher, +; Starling, +. **Total:** 36 species; 166 territorial males (1169/km<sup>2</sup>, 474/100 acres). **Coverage 1976:** May 22; June 1, 9, 11, 14, 17; July 9. **Census:** Red-eyed Vireo, 28 (197, 77); Wood Thrush, 24 (169, 69); Hooded Warbler, 14.5 (102, 41); Carolina Wren, 11 (77, 31); Cardinal, 11; Red-bellied Woodpecker, 9 (63, 26); Downy Woodpecker, 8 (56, 23); E. Wood Pewee, 8; Acadian Flycatcher, 7 (49, 20); Rufous-sided Towhee, 6 (42, 17); Tufted Titmouse, 5 (35, 14); Kentucky Warbler, 5; Carolina Chickadee, 4 (28, 11); Brown-headed Cowbird, 4; Com. Flicker, 3 (21, 9); White-breasted Nuthatch, 3; Scarlet Tanager, 3; Indigo Bunting, 3; Mourning Dove, 2; Hairy Woodpecker, 2; Yellow-throated Vireo, 2; Red-tailed Hawk, 1; Yellow-billed Cuckoo, 1; Great Crested Flycatcher, 1; White-eyed Vireo, 1; Ovenbird, 1; Ruby-throated Hummingbird, +; Blue Jay, +; Com. Crow, +; Gray Catbird, +; Brown Thrasher, +; Starling, +; Com. Yellowthroat, +. **Total:** 33 species; 167.5 territorial males (1179/km<sup>2</sup>, 479/100 acres). **Remarks:** The significance of these censuses is discussed in an article in this issue on p. 17. — **BRUCE WHITCOMB**, 10271 Windstream Drive, Columbia, Md. 21045, **DANNY BYSTRAK**, Patuxent Wildlife Research Center, Laurel, Md. 20710, **ROBERT WHITCOMB**, (compiler), U.S. Dept. of Agriculture, ARS, PPI, Beltsville, Md. 20705.



*Census 170. Selectively logged mature Tulip-tree-oak forest. Tangles of Rubus and Lonicera underneath a canopy break.*