

Forty-second Breeding Bird Census

Edited by Willet T. Van Velzen

Earlier in this issue, it was promised that with the new, larger page size, *American Birds* would require fewer pages per issue. We estimated that the difference might be as great as 50%. But we failed to take into account the increasing importance of the environmental studies featured in this issue, and the ever-growing volume of manuscripts submitted for publication. Last year's page total for issue Number 1 was 128. This issue is only 16 pages less: 112. The difference can be seen in the comparative totals of studies submitted: Winter Bird-Population Studies published 1978: 72; 1979: 120. Gain: 67%. Breeding Bird Censuses 1978: 181; 1979: 211 (including all 2-year studies published this year). Gain: 17%. We registered this gain in spite of the defection of our West Virginia contingent (14 stud-

ies) over the matter of our announced publication fee. While there were a few understandable gripes over the fee, no other studies were lost to publication in *American Birds* — where they belong — over the \$5 per manuscript page fee to all authors, except for students and senior citizens. Total fees contributed for this issue: about \$2340.

The great increase in studies has unfortunately resulted in a rather severe trimming of the planned contents of this issue. Lost to the exigencies of the 112-page imperative were two good feature articles (postponed but not abandoned), and a number of excellent photographs that might have livened the solid, unrelieved text of the last 60 studies.

List of Censuses

<i>Habitat</i>	<i>State or Province</i>	<i>Hec- tares</i>	<i>Pairs per sq. km.</i>	<i>Hrs. Obs.</i>	<i>Spe- cies</i>	<i>Yrs of Study</i>
A. Eastern-Deciduous Forest						
1. Birch-Maple-Oak Forest	Connecticut	13.9	481	20	30	3
2. Second-growth Hardwood Forest	Connecticut	10.1	865	16	42	12
3. Climax Maple-Birch-Beech Forest	New York	8.5	353	20	16	1
4. Maple-Oak Forest	New York	72.8	594	55	65	2
5. Mature Beech-Maple Forest	New York	8.1	1124	42	18	1
6. Mature Red Oak-Sugar Maple Forest	New York	8.1	988	18	29	2
7. Young Red Maple-Gray Birch Forest	New York	8.1	1384	12	37	3
8. Young White Ash-Basswood Forest	New York	8.1	1334	17	43	3
9. Birch-Maple-Oak Forest	Pennsylvania	9.0	667	16	27	5
10. Mountain Top, Oak-Maple Forest	Pennsylvania	6.1	469	8	17	5
11. Mature Deciduous Floodplain Forest	Maryland	7.6	1094	43	24	26
12. Mixed Hardwood Forest	Maryland	11.3	1024	15	41	16
13. Selectively Logged Mature Tulip-tree-Oak Forest	Maryland	14.2	1225	34	31	4
14. Mixed Upland Habitat	Dist. of Columbia	14.2	868	31	22	19
15. Mixed Oak Forest	Virginia	6.1	214	20	18	1
16. Oak-Hickory Forest	Virginia	6.1	132	30	14	1
17. Oak-Hickory-Tulip-tree Forest	Virginia	13.5	293	25	17	1
18. Red Maple-Black Gum Mixed Hardwoods	Virginia	10.1	593	32	22	1
19. Upland Oak-Hickory Forest	Virginia	11.0	849	54	24	6
20. Upland Tulip-tree-Oak Forest	Virginia	20.6	262	29	23	4
		20.6	267	24	20	5
21. Floodplain Forest	North Carolina	13.0	585	18	25	2
22. Mixed Deciduous Forest	North Carolina	12.6	522	18	27	3
23. Mixed Deciduous Forest	North Carolina	8.8	623	18	24	6
24. Mountain Ravine Mixed Forest	Georgia	5.9	824	56	23	10
25. Mixed Deciduous Forest	Ontario	36.4	306	71	36	1
26. Wooded City Ravine	Ontario	20.0	215	21	15	9
27. Mature Aspen Forest	Minnesota	8.7	810	26	25	1
28. Aspen-Birch Forest	Minnesota	14.0	457	30	32	2
29. River Bottom Forest	Manitoba	14.0	461	24	21	1
		14.0	311	24	20	2
30. Upland Maple-Oak Forest	Wisconsin	5.4	372	14	16	2
31. Aspen Forest (20-year)	Michigan	5.1	559	22	22	1
32. Aspen Forest (50-year)	Michigan	9.0	400	18	27	1
33. Mature Mixed Hardwood Forest	Michigan	9.3	693	17	25	1
34. Oak-Hickory-Maple Forest	Illinois	13.0	278	18	25	3
35. Black Oak-Sassafras Woods	Indiana	22.2	194	65	12	5

<i>Habitat</i>	<i>State or Province</i>	<i>Hec-tares</i>	<i>Pairs per sq km</i>	<i>Hrs Obs</i>	<i>Spe-cies</i>	<i>Yrs of Study</i>
36. Mixed Hardwood Regenerating	Ohio	20.2	282	31	29	3
37. Neotoma Valley	Ohio	20.2	415	28	37	1
38. Oak-Hickory Forest I	Kansas	8.1	630	15	23	1
39. Oak-Hickory Forest II	Kansas	8.1	371	14	18	1
40. Oak-Hickory Forest III	Kansas	8.1	575	12	29	1
41. Oak-Hickory Forest IV	Kansas	8.1	340	12	19	1
42. Oak-Hickory Forest V	Kansas	8.1	432	11	25	1
43. Oak-Hickory Forest VI	Kansas	8.1	297	10	18	1
44. Bottomland Hardwood Forest	Texas	6.5	687	15	20	1
B. Eastern-Coniferous-Deciduous (Mixed)						
45. Maple-Pine-Oak Second-growth Forest	Massachusetts	11.8	377	37	26	3
46. Climax Hemlock-White Pine Forest with Transition Hardwoods	Connecticut	10.5	950	21	38	12
47. Climax Beech-Hemlock Forest	New York	8.7	397	20	21	1
48. Pitch Pine Scrub Oak Barrens	New York	9.7	315	32	5	1
		9.7	352	28	6	2
49. Red Oak-White Pine Island	New York	8.1	4732	11	39	1
50. Second-growth Oak-Pitch Pine Forest	New York	9.3	484	28	18	1
		9.3	430	33	15	1
51. Upland Mixed Pine-Spruce-Hardwood Plantation	New York	16.6	479	16	33	5
52. Mixed Oak-Pine Forest I	Pennsylvania	6.0	576	16	14	1
		6.0	534	14	14	2
53. Mixed Oak-Pine Forest II	Pennsylvania	11.0	339	14	17	1
		11.0	389	15	25	2
54. Mountain Top, Mixed Hardwood-White Pine Forest	Pennsylvania	6.1	593	9	21	5
55. Central Hardwood Forest with Scattered Pine	Dist. of Columbia	26.3	192	33	17	19
56. Tamarack Bog and Hardwood	Michigan	8.5	265	8	20	3
57. Mixed Hardwood and Hemlock Ravines	Ohio	4.9	844	25	25	1
58. Long-leaf Pine-Water Oak Forest	Mississippi	14.6	391	18	16	1
59. Mixed Pine-Hardwood Forest	Texas	6.3	507	8	13	5
C. Eastern-Coniferous						
60. Upland Scotch Pine Plantation	New York	9.3	833	19	21	10
61. Young Spruce Forest	Maine	4.0	680	5	15	2
62. Red Pine Plantation	Connecticut	8.5	1030	16	34	1
D. Eastern-Mixed Habitats						
63. Mixed Forest, Old Field and Homesite	Vermont	10.9	1135	25	45	6
64. Field Regeneration (11-12 years)	Massachusetts	4.3	530	20	7	1
		4.3	794	27	9	2
65. Abandoned Nursery with Hedgerows	Connecticut	14.2	655	24	24	2
66. Mixed Upland Habitat and Swamp	Connecticut	14.2	646	27	26	11
67. Upland Brushy Pasture	Connecticut	8.5	1318	18	36	12
68. Abandoned Pasture-Young Mixed Forest	New York	3.4	552	4	17	3
69. Transmission Line Right-of-way	New York	7.1	484	14	18	1
70. Deciduous Forest with Pond and Brook	New Jersey	16.2	253	11	29	15
71. Brushy Field and Wooded Edge	Pennsylvania	7.5	610	29	23	1
72. Mountain Top Bog with Mixed Hardwood and Evergreen Edge	Pennsylvania	6.1	478	8	22	5
73. Mixed Upland Habitat	Pennsylvania	7.8	1293	22	28	2
74. Old Field-Meadow and Primary Deciduous Thickets	Pennsylvania	10.1	346	23	22	5
75. Birch-Oak Savannah and Wetland	Ontario	5.9	1239	31	20	1
76. Dune Grass-Cottonwood Beach	Ontario	12.1	25	21	4	2
77. Interdunal Meadow	Ontario	6.1	990	41	22	1
78. Aspen Clearcut (8-year)	Minnesota	10.5	428	25	25	1
79. Mixed Wetland with Tamarack and Aspen Groves, Shrubland and Fen	Wisconsin	16.9	578	20	39	2
80. Aspen Clearcut (2-year)	Michigan	13.9	490	23	29	1
81. Disturbed Oak-Hickory Forest, Pine Stand, Edge, and Pond	Ohio	14.2	593	28	38	40
82. Abandoned Field and Pasture	Indiana	9.8	437	80	15	1
83. Old Field with Brush Patches	Indiana	17.1	625	27	32	2
84. Suburban Cemetery	Indiana	5.9	1082	32	18	1
85. Deciduous Clearcut	Tennessee	20.2	301	12	13	4
86. Deciduous Forest and Contour Strip Mine	Tennessee	23.4	312	15	29	1
87. Mixed-Mesophytic Woods, Fields and Brush	Tennessee	30.0	331	54	36	2
88. Strip Mine and Deciduous Woodlot	Tennessee	20.2	249	17	21	1
89. Deciduous Clearcut	Georgia	6.9	465	17	14	2
E. Central-Prairie						
90. Kentucky Blue Grass Prairie	North Dakota	4.9	93	3	5	7
91. Mixed Prairie I	North Dakota	10.0	225	7	15	7
92. Mixed Prairie II	North Dakota	6.1	98	4	9	7
93. Mixed Prairie III	North Dakota	6.1	49	3	5	7
94. Mixed Prairie IV	North Dakota	6.1	107	4	10	7
95. Mixed Prairie V	North Dakota	6.1	172	5	11	7

<i>Habitat</i>	<i>State or Province</i>	<i>Hec-tares</i>	<i>Pairs per sq km</i>	<i>Hrs Obs</i>	<i>Spe-cies</i>	<i>Yrs of Study</i>
96. Mixed Prairie VIII	North Dakota	8.7	103	4	8	3
97. Floodplain in Tall Grass Prairie	Kansas	10.1	376	72	5	3
98. Shortgrass Prairie	Colorado	40.5	131	21	4	4
F. Central-Disturbed Habitats						
99. Mixed Habitat-Disturbed Bottomland	Oklahoma	40.5	335	44	42	7
100. Woodland along Stream on Prairie	Kansas	12.4	627	16	31	1
G. Western-Deciduous						
101. Floodplain Cottonwood Forest	Colorado	9.7	1848	39	25	8
102. Floodplain Cottonwood Forest	Colorado	52.2	339	15	20	6
103. Oregon White Oak Forest	Washington	7.5	888	18	28	1
104. Deciduous Oak Woodland	California	5.7	256	17	11	1
105. Oak Woodland	California	16.0	288	24	19	1
106. Oak Woodland	California	8.1	247	15	12	1
107. Oak Woodland	California	16.0	400	64	17	1
H. Western-Coniferous-Deciduous (Mixed)						
108. Open Aspen Grove-Scattered Conifers	Colorado	14.0	453	27	30	3
109. Ponderosa Pine-Scrub Oak-Mahogany Woodland	Colorado	8.1	371	65	12	11
110. Sparse Pine-Fir-Aspen Woodland	Utah	16.0	256	26	20	1
111. Riparian Woodland-Live Oak-Juniper	Arizona	9.1	1505	40	36	1
I. Western-Coniferous						
112. Pinyon-Juniper-Ponderosa Pine Ecotone	New Mexico	15.0	275	53	19	2
J. Western-Mixed Habitats						
113. River Falls and Western Red Cedar-Douglas-fir Forest	Montana	44.5	204	35	33	1
114. Cottonwood Riverbottom-Pasture	Colorado	71.6	214	21	37	6
115. Scattered Mixed Coniferous Forest	Oregon	32.4	139	27	11	6
116. Farm with Ponds	Utah	10.5	694	26	32	3
117. Mixed-Mesophytic Canyon Bottom	New Mexico	12.1	861	74	33	3
118. Annual Grassland and Vernal Pools	California	16.0	34	10	6	1
119. Desert Riparian-Freshwater Marsh and Ponds	California	15.4	569	24	40	2
120. Riparian Hardwood Forest, Marsh, Ponds and Bypass Channel	California	10.5	1107	33	36	1
121. Suburban Nature Center	California	34.4	314	34	20	3
122. Suburban Park	California	63.5	25	22	6	1
123. Suburban Park with Pond	California	7.4	434	21	12	1
124. Urban Park	California	13.9	338	14	9	1
K. Western-Desert and Shrub						
125. Silver Buffaloberry-Red Osier Dogwood Coulee	Montana	25.0	168	21	15	2
126. Silver Buffaloberry-Silver Sagebrush Coulee	Montana	25.0	154	15	11	2
127. Silver Sagebrush Flat	Montana	24.0	175	16	17	2
128. Needle-and-thread-Blue Grama Grassland	Montana	25.0	148	15	6	2
129. Western Wheatgrass-Blue Grama Pasture	Montana	25.0	104	13	5	2
130. Blue Grama-Rabbitbrush Grassland	Montana	16.2	114	32	5	2
131. Pygmy Forest-Chaparral	Utah	16.2	334	22	20	2
132. Creosote Bush Community	California	12.3	8	36	3	1
133. Creosote-Joshua Tree Desert	California	36.0	33	32	14	1
134. Desert Oasis Woodland I	California	5.7	435	38	6	1
135. Desert Oasis Woodland II	California	10.1	240	34	5	1
136. Desert Riparian Thicket	California	10.3	460	30	21	1
137. Disturbed Coastal Scrub A	California	4.7	309	30	19	6
138. Disturbed Coastal Scrub B	California	8.1	266	31	22	7
139. Grazed Creosote Bush-Yucca Desert Scrub I	California	20.0	53	12	11	1
140. Grazed Creosote Bush-Yucca Desert Scrub II	California	20.0	58	12	11	1
141. Interior Chaparral	California	8.1	426	72	20	1
142. Ironwood-Smocketree Desert Wash	California	18.6	73	23	6	1
143. Joshua Tree Woodland I	California	9.0	83	24	8	2
144. Joshua Tree Woodland II	California	20.0	125	28	13	1
145. Joshua Tree Woodland III	California	20.0	145	29	19	1
146. Mesquite Community	California	12.6	373	30	14	1
147. Mesquite Forest	California	24.3	214	29	9	1
148. Mohave Yucca-Staghorn Cholla Desert Scrub	California	20.0	90	24	12	2
149. Ocotillo-Cholla	California	16.2	213	31	12	1
150. Palo Verde Desert Wash	California	15.8	181	23	10	1
151. Sagebrush Scrub I	California	20.0	115	28	6	2
152. Sagebrush Scrub II	California	21.0	43	28	6	2
153. Saltbush Community	California	12.3	0	36	0	1
154. Saltbush-Eurotia Desert	California	36.0	53	30	6	1
155. Shadscale Scrub	California	27.0	74	28	5	1
156. Yucca-Creosote Community I	California	12.3	118	39	11	1
157. Yucca-Creosote Community II	California	12.3	196	52	14	1

Habitat	State or Province	Hec-tares	Pairs per sq. km.	Hrs Obs.	Spe-cies	Yrs of Study
L. Northern-Taiga and Tundra						
158. Aspen Forest	Manitoba	16.0	594	30	15	1
159. Aspen Forest	Manitoba	14.0	146	27	10	1
160. Aspen Forest	Manitoba	16.0	310	23	13	1
		16.0	231	20	13	2
161. Aspen Forest	Manitoba	15.0	350	28	19	1
		15.0	327	38	13	2
162. Black Spruce Forest	Manitoba	16.0	219	24	10	1
163. Jack Pine Forest	Manitoba	16.0	113	20	9	1
164. Mixed Forest	Manitoba	16.0	328	33	20	1
165. Semi-open Black Spruce Bog	Manitoba	36.0	35	24	10	1
166. Lowland Low and Medium Willow Thicket	Alaska	4.3	447	16	15	1
167. Lowland Tall Alder-Willow Thicket	Alaska	3.4	653	16	18	1
168. Upland Aspen Forest	Alaska	10.0	270	32	13	1
169. Upland Birch Forest	Alaska	10.0	265	32	15	1
170. Upland Birch-White Spruce Forest	Alaska	10.0	360	32	14	1
171. Upland White Spruce Forest	Alaska	10.0	260	32	16	1
172. Arctic Low Foothills Tundra	Alaska	25.0	188	93	16	2
173. Wet Coastal Plain Tundra I	Alaska	33.0	109	39	11	4
174. Wet Coastal Plain Tundra II	Alaska	36.0	111	45	11	4
175. Wet Coastal Plain Tundra III	Alaska	36.0	93	51	11	4
176. Wet Coastal Tundra I	Alaska	29.8	155	31	13	2
M. Wetlands						
177. Shrubby Swamp and Sedge Hummocks	Connecticut	8.1	2403	21	24	12
178. Cat-tail Marsh	New York	6.9	436	5	11	1
179. Inland Fresh Water Marsh	Pennsylvania	5.2	695	10	10	1
		5.2	878	14	14	2
180. Sedge-Tamarack Dune Pond	Ontario	9.6	549	59	11	1
181. Cat-tail and Sedge Marsh	Wisconsin	5.7	1928	57	8	4
182. Freshwater Wetland I	North Dakota	93.8	389	12	21	1
183. Freshwater Wetland II	North Dakota	246.9	20	16	17	1
184. Freshwater Lake I	North Dakota	134.4	89	16	18	1
185. Freshwater Lake II	North Dakota	49.0	61	14	14	1
186. Bulrush and Cat-tail Marsh in Conifer Forest	Montana	40.5	408	41	51	4
187. Floodplain Pond	Colorado	8.5	165	4	4	5
N. Fields and Cultivated Areas						
188. Hay-cropped Meadow	Massachusetts	9.5	283	20	8	1
		9.5	163	27	4	2
189. Old Field	Pennsylvania	7.1	506	8	17	5
190. Abandoned Turf Field	Maryland	6.3	253	4	5	3
		6.3	301	6	6	4
191. Orchard Grass-Tall Fescue Meadow	Illinois	12.1	247	18	12	3
192. Valley Grassland	California	8.1	80	12	3	1
O. Residential						
193. Suburban Housing Development	Massachusetts	15.0	233	26	16	1
194. Suburban Residential	New Jersey	5.8	721	10	13	1
195. Urban Habitat	Dist. of Columbia	7.9	469	11	16	2
P. Late Reports						
196. Pitch Pine-Scrub Oak Forest II	Massachusetts	7.5	920	51	15	2
197. Hickory-Oak-Ash Floodplain Forest	Maryland	18.4	1007	26	45	7
198. Upland Tulip-tree-Maple-Oak Forest	Maryland	12.0	726	17	29	8
199. Coastal Sage Scrub	California	6.0	451	78	9	1

1. BIRCH-MAPLE-OAK FOREST. — **Location:** Connecticut; New London Co., 1 mile N-NW of intersection of state routes 161 and 156; 40°20'N, 72°12'W, Niantic Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 13.94 ha = 34.44 acres. **Description of Plot:** See *AB* 31:29 (1977). **Weather:** Cool spring with normal precipitation. **Coverage:** May 13, 20, 27; June 3, 4, 10, 17. Total man-hours: 20. **Census:** Rufous-sided Towhee, 7 (50, 20); Veery, 6 (43, 17), Canada Warbler, 6; Tufted Titmouse, 4 (29, 12); Gray Catbird, 4; Wood Thrush, 4; Black-and-white Warbler, 4; Great Crested Flycatcher, 3 (22, 9); Blue Jay, 3; Black-

capped Chickadee, 3; White-eyed Vireo, 2; Red-eyed Vireo, 2; Worm-eating Warbler 2; Brown-headed Cowbird, 2 (females); Ruffed Grouse, 1; Mourning Dove, 1; Great Horned Owl, 1; Com. Flicker, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; Brown Thrasher, 1; Blue-winged Warbler, 1; Com. Yellowthroat, 1; Hooded Warbler, 1; Am. Redstart, 1; Red-winged Blackbird, 1; N. Oriole, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Downy Woodpecker, +. **Total:** 30 species; 67 territorial males or females (481/km², 195/100 acres). **Remarks:** There were no major changes in any of the bird populations, only minor fluctuations. The number of territorial

males rose slightly. On one trip a pair of Acadian Flycatchers exhibited signs of nesting but were never seen again. — *ANDREW DASINGER, 12 Stone Cliffe Dr., Niantic, Conn. 06357.*

2. SECOND - GROWTH HARDWOOD FOREST. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris; 41°42'26"N, 73°12'22"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965, 12 intermittent years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See *AFN* 19:590-591 (1965). **Coverage:** April 30; May 21; June 4, 6,

8 Total man-hours 15½ **Census:** Ovenbird, 10 (99, 40), Red-eyed Vireo, 9 (89, 36), Veery, 8 (79, 32); Am. Redstart, 6 (59, 24); Black-and-white Warbler, 5 (49, 20); Blue-winged Warbler, 4 (40, 16); Com. Yellowthroat, 4; Rufous-sided Towhee, 4; Black-capped Chickadee, 3 (30, 12); Tufted Titmouse, 3; Chestnut-sided Warbler, 2.5; Hairy Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; Gray Catbird, 2; Am. Goldfinch, 2; Rose-breasted Grosbeak, 1.5; Ruffed Grouse, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Cedar Waxwing, 1; Am. Robin, 1; Wood Thrush, 1; "Brewster's Warbler, 1; Louisiana Waterthrush, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1, Broad-winged Hawk, 0.5; Mourning Dove, 0.5, Barred Owl, 0.5; E. Phoebe, 0.5; House Wren, 0.5; Yellow-throated Vireo, 0.5; N. Oriole, 0.5; Cardinal, 0.5; Song Sparrow, 0.5; Magnolia Warbler, +; Blackburnian Warbler, +, Purple Finch, +. **Total:** 42 species; 87.5 territorial males (865/km², 350/100 acres). **Remarks:** Very little change. Thanks to Jim Cavanaugh. — *ANDREW MAGEE, 34 Hobson Street, Springfield, Mass. 01109.*

3. CLIMAX MAPLE - BIRCH - BEECH FOREST. — **Location:** New York; St. Lawrence Co., Pack Demonstration Forest of the Cranberry Lake Biological Field Station; 44°15'N, 74°45'W; Cranberry Lake Quadrangle, USGS. **Continuity:** New. **Size:** 8.5 ha = 21 acres (compass and range finder). **Description of Plot:** A mature deciduous forest undisturbed for the last 175 yrs. A quantitative survey of 24 0.1 acre circles gave the following results: Trees 3 in. in diameter and over, 334/acre; total basal area 162.3 ft²/acre. Tree species comprising 90% of the total, followed by number of trees/acre, relative density (%), relative dominance, and frequency, were: Sugar Maple (*Acer saccharum*), 156, 47, 47, 100; dead trees, 55, 17, 11, 100; Yellow Birch (*Betula lutea*), 53, 16, 12, 92; Am. Beech (*Fagus grandifolia*), 45, 14, 16, 79; Red Maple (*A. rubrum*), 9, 3, 3, 29. Trees by diameter size class (trees/acre, relative density (%), basal area in ft²/acre, and relative dominance): A (3-6 in.) 164, 49, 16.4, 10; B (6-9 in.) 81, 24, 24.4, 15; C (9-15 in.) 63, 19, 50, 31; D (15-21 in.) 17, 5, 30.8, 19; E (21-27 in.) 8, 2, 25.8, 16; F (27-33 in.) 1, 1, 6.1, 4; G (33-40 in.) 1, 1, 8.9, 5. Shrub stems per acre, 783; ground cover, 41%; canopy cover, 85%; mean canopy height, 68 ft (range 59-80). **Edge:** Surrounded by similar forest on all sides. **Topography:** Slight E slope. **Elevation:** 1520-1540 ft. **Coverage:** June 21, 23-24, 27; July 1, 3, 7; 0530-0900. Total man-hours: 20. **Census:** Red-eyed Vireo, 11 (129, 52); Black-throated Green Warbler, 8 (94, 38); Am. Redstart, 4 (47, 19); Black-throated Blue Warbler, 2; Ovenbird, 2; Yellow-bellied Sapsucker, 1; Hermit Thrush, 1; Scarlet Tanager, 1; Broad-winged Hawk, +; Great Crested Flycatcher, +; E. Wood Pewee, +, Black-capped Chickadee, +; White-breasted Nuthatch, +; Wood Thrush, +; Swainson's Thrush, +; Rose-breasted Grosbeak, +. **Total:** 16 species; 30 territories (353/km², 143/100 acres). **Remarks:** Conducted as an ornithology class project at the Cranberry Lake Biological Field Station. Special thanks to Paige Noon and Doug Fraser for assistance. — *BARRY R. NOON, Biology Dept., Siena College, Loudonville, N.Y. 12211.*

4. MAPLE - OAK FOREST. — **Location:** New York, Ulster Co. John Burroughs Nature Sanctuary, 1 mi W of West Park; 41°48'N, 73°58'W, Hyde Park Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 72.8 ha = 180 acres. **Description of Plot:** See AB 32:54 (1978). **Weather:** A cold, dry spring noticeably retarded migration and nesting. **Coverage:** Mar. 15; Apr. 20; May 16, 28-31; June 1, 3-6, 8, 10, 16, 18, 20-21, 23-24; July 15; 0445-0800 and occasionally at dusk. Total man-hours; 55. **Census:** Black-and-white Warbler, 32 (44, 18); Ovenbird, 31.5 (43, 18); Black-capped Chickadee, 28.5 (39, 16); Great Crested Flycatcher, 24.5 (34, 14); Worm-eating Warbler, 24 (33, 13); Red-eyed Vireo, 22.5 (31, 12); Wood Thrush, 22.5; Louisiana Waterthrush, 22 (30, 12); Com. Flicker, 19 (26, 11); Blue Jay, 17 (23, 9); Scarlet Tanager, 16.5 (23, 9); E. Wood Pewee, 13.5 (19, 8); Red-winged Blackbird, 11 (15, 6); Downy Woodpecker, 10 (14, 6); Tufted Titmouse, 9 (12, 5); N. Oriole, 9; Am. Robin, 8 (11, 4); Blue-gray Gnatcatcher, 7 (10, 4); Com. Grackle, 7; Yellow-billed Cuckoo, 6.5 (9, 4); Cardinal, 6.5; Chipping Sparrow, 6.5; Indigo Bunting, 5 (7, 3); Am. Goldfinch, 4.5 (6, 2); Hairy Woodpecker, 4 (5, 2); E. Phoebe, 4; Cedar Waxwing, 4; Black-billed Cuckoo, 3 (4, 2); Pileated Woodpecker, 3; Barn Swallow, 3; Solitary Vireo, 3; Com. Yellowthroat, 2.5; Am. Redstart, 2.5; White-breasted Nuthatch, 2; Yellow-throated Vireo, 2; Golden-winged Warbler, 2; Nashville Warbler, 2; Yellow Warbler, 2; Cerulean Warbler, 2; N. Waterthrush, 2; Hooded Warbler, 2; Canada Warbler, 2; Wood Duck, 1.5; Ruffed Grouse, 1.5; Gray Catbird, 1.5; Rose-breasted Grosbeak, 1.5; Green Heron, 1; Mallard, 1; Black Duck, 1; Broad-winged Hawk, 1; Barred Owl, 1; Belted Kingfisher, 1; E. Kingbird, 1; Willow Flycatcher, 1; Winter Wren, 1; Brown Thrasher, 1; Veery, 1; Magnolia Warbler, 1; Black-throated Blue Warbler, 1; Black-throated Green Warbler, 1; Brown-headed Cowbird, 1; Mourning Dove, 0.5; Song Sparrow, 0.5; Red-tailed Hawk, +; Chimney Swift, +. **Total:** 65 species; 432.5 territories (594/km², 240/100 acres). **Remarks:** 6 nests were found: Phoebe 2; 1 each of Mallard, Black Duck, flicker, and crested flycatcher. — *JIM STAPLETON John Burroughs Nature Sanctuary, P.O. #220, West Park, N.Y. 12493.*

5. MATURE BEECH - MAPLE FOREST. — **Location:** New York; Oswego Co., Rice Creek Biological Field Station, 43°25'N, 76°30'W, Oswego West Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres. **Description of Plot:** Canopy trees averaged 15 m in height. There was a 20% understory of shrubs averaging 1 m in height; a 30% herbaceous ground cover. The canopy trees followed by relative density and mean dbh in cm were: Am. Beech (*Fagus grandifolia*) 65%, 28; Sugar Maple (*Acer saccharum*) 13%, 35; White Ash (*Fraxinus americana*) 12%, 29; Black Cherry (*Prunus serotina*) 5%, 12; Balsam Fir (*Abies balsamea*) 5%, 17. Average distance between stems, 2.6 m. **Edge:** Bordered on the W by coniferous forest, N by field and similar woods, S by fields, and E by younger woods. **Topography:** Flat to slightly rolling. **Elevation:** 260 ft. **Coverage:** May 23, 25-26; June 1-2, 7-9, 15-16, 20-21, 23, 26, 28-30; 0600-2100, EDT. Total: 42 hours. **Census:** Red-eyed Vireo, 15 (185, 75); Wood Thrush, 14

(173, 70), E. Wood Pewee, 9 (111, 45), Black-capped Chickadee, 7 (86, 35), Ovenbird, 7, Cardinal, 7; Veery, 6 (74, 30); Com. Yellowthroat, 5 (62, 25); Great Crested Flycatcher, 3 (37, 15); Am. Robin, 3; Yellow Warbler, 3, Am. Redstart, 3; Blue Jay, 2; Com. Crow, 2, Gray Catbird, 2; Black-billed Cuckoo, 1, White-breasted Nuthatch, 1; Scarlet Tanager, 1. **Total:** 18 species; 91 territorial males (1124/km², 455/100 acres). **Visitors:** Chimney Swift, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** I thank George Maxwell for his help. — *VICTORIA J. STAGNITTA, Dept of Zool., State Univ. College, Oswego, NY 13126.*

6. MATURE RED OAK-SUGAR MAPLE FOREST. — **Location:** New York; Jefferson Co., on Wellesley Island 4 mi ENE of the Thousand Islands International Bridge 44°21'N, 76°56'W, Alexandria Bay Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 32:54 (1978). **Weather:** Precipitation consisting of light showers during 2 censuses totaling approximately 40 min. The season was drier than normal. **Coverage:** May 21, 29; June 4, 6-7, 14-15, 19, 23; July 5, 11; 0500-2200, EDT. Total: 18 man-hours. **Census:** Am. Redstart, 11 (136, 55); E. Wood Pewee, 8 (99, 40); Wood Thrush, 7 (86, 35); Am. Robin, 6 (74, 30); Red-eyed Vireo, 6; N. Oriole, 5 (62, 25); Rose-breasted Grosbeak, 4 (49, 20); Great Crested Flycatcher, 3 (37, 15); Warbling Vireo, 3; Yellow Warbler, 3; Red-winged Blackbird, 3, Com. Flicker, 2; Com. Yellowthroat, 2; Com. Grackle, 2; Chimney Swift, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; White-breasted Nuthatch, 1; House Wren, 1; Gray Catbird, 1, Veery, 1; Starling, 1; Yellow-throated Vireo, 1; N. Waterthrush, 1; Ovenbird, 1; Rufous-sided Towhee, 1; Song Sparrow, 1. **Total:** 29 species; 80 territorial males (988/km², 400/100 acres). **Visitors:** Green Heron, Mourning Dove, Yellow-bellied Cuckoo, E. Kingbird, Least Flycatcher, Tree Swallow, Com. Crow, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** The Chimney Swift was present over the area on every visit and was frequently noted flying into the woods below tree top level. While no nest was found the species is assumed to be breeding. — *GEORGE R. MAXWELL II and GERALD A. SMITH, Dept. of Zool., State Univ. College, Oswego, N.Y. 13126.*

7. YOUNG RED MAPLE - GRAY BIRCH FOREST. — **Location:** New York; St. Lawrence Co., 4 mi NE of Waddington at Coles Creek, 44°53'N, 75°07'W, Louisville Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 31:31 (1977). **Weather:** No precipitation during census; a dry season. **Coverage:** May 31; June 1-3, 5, 9, 19-20, 26; July 11; 0430-2100, EDT. Total: 12 man-hours. **Census:** Veery, 14 (173, 70); Am. Redstart, 13 (161, 65); N. Oriole, 7 (86, 35); Rose-breasted Grosbeak, 7; Red-winged Blackbird, 6 (74, 30); Red-eyed Vireo, 5 (62, 25); Yellow Warbler, 5; Am. Robin, 4 (49, 20); White-throated Sparrow, 4; Great Crested Flycatcher, 3 (37, 15); Gray Catbird, 3; Warbling Vireo, 3; Com. Yellowthroat, 3, Com. Grackle, 3; Song Sparrow, 3; Ruffed Grouse, 2; Com. Flicker, 2; Least Flycatcher,

2, E Wood Pewee, 2, House Wren, 2, Brown Thrasher, 2, Ovenbird, 2, Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Tree Swallow, 1; Blue Jay, 1; Black-capped Chickadee, 1; Wood Thrush, 1; Black-and-white Warbler, 1; Nashville Warbler, 1; Chestnut-sided Warbler, 1; N. Waterthrush, 1, Scarlet Tanager, 1; Rufous-sided Towhee, 1, Indigo Bunting, 1. **Total:** 37 species; 112 territorial males (1384/km², 560/100 acres). **Visitors:** Great Blue Heron, Canada Goose, Killdeer, Ring-billed Gull, Barn Swallow, Purple Martin, Com. Crow, Cedar Waxwing, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** For the third consecutive year the number of species and total individuals increased from last year. — *GERALD A. SMITH and GEORGE R. MAXWELL II, Dept. of Zool., State Univ. College, Oswego, N.Y. 13126.*

8. YOUNG WHITE ASH - BASSWOOD FOREST. — **Location:** New York; St. Lawrence Co., 3mi SW of Morristown at Jacques Cartier State Park, 44°33'N, 75°41'W, Morristown Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 31 31-32 (1977). **Weather:** A total of 35 minutes of light showers occurred during two censuses. The season was drier than normal. **Coverage:** May 18, 25, 30-31; June 3, 8-9, 15, 22, 27; July 6; 0500-2100, EDT. Total: 16.5 man-hours. **Census:** Am. Redstart, 11 (136, 55), Yellow Warbler, 8 (99, 40); Rose-breasted Grosbeak, 6 (74, 30); E. Wood Pewee, 5 (62, 25), Am. Robin, 5; Wood Thrush, 5; Warbling Vireo, 5; Great Crested Flycatcher, 4 (49, 20), House Wren, 4; Veery, 4; Red-winged Blackbird, 4; Gray Catbird, 3 (37, 15); Com. Yellowthroat, 3; Com. Grackle, 3; Rufous-sided Towhee, 3; Mourning Dove, 2; Blue Jay, 2, Black-capped Chickadee, 2; Red-eyed Vireo, 2; Pine Warbler, 2; Ovenbird, 2; Song Sparrow, 2; Mallard, 1; Ruffed Grouse, 1; Com. Snipe, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; Least Flycatcher, 1; Tree Swallow, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Starling, 1; Black-and-white Warbler, 1; Yellow-rumped Warbler, 1; Chestnut-sided Warbler, 1; Scarlet Tanager, 1, Cardinal, 1; Indigo Bunting, 1; Purple Finch, 1; Chipping Sparrow, 1; White-throated Sparrow, 1. **Total:** 43 species; 108 territorial males (1334/km², 540/100 acres). **Visitors:** Green Heron, Killdeer, Ring-billed Gull, Chimney Swift, Barn Swallow, Purple Martin, Com. Crow, Cedar Waxwing, Black-throated Green Warbler, Blackpoll Warbler, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** The pair of Mallards nested in a small wet area resulting from the overflow of a roadside ditch. — *GEORGE R. MAXWELL II and GERALD A. SMITH, Dept. of Zool., State Univ. College, Oswego, N.Y. 13126.*

9. BIRCH - MAPLE - OAK FOREST. — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mi S of intersection of State Rte 228 and Kepple Rd on Todd Sanctuary; 40° 44'N, 79°42'W, Freeport Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 9 ha = 22.4 acres. **Description of Plot:** See AB 28:992-993 (1974). **Weather:** Cool with frequent rains. **Coverage:** June 1-4,

6, 10-12, 15-16, 25, between 0500-0830 and 1830-2130 hours Total man-hours 16 **Census:** Red-eyed Vireo, 16.5 (182, 74); Cardinal, 6.5 (72, 29); Scarlet Tanager, 4.5 (50, 20); Wood Thrush, 4 (44, 18); Tufted Titmouse, 3.5 (39, 16); Cerulean Warbler, 3.5; Hooded Warbler, 3 (33, 13); Acadian Flycatcher, 2.5; E. Wood Pewee, 2.5; Kentucky Warbler, 2.5; White-breasted Nuthatch, 2; Blue-gray Gnatcatcher, 2; Chipping Sparrow, 1.5; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Brown-headed Cowbird, 1 (female); Broad-winged Hawk, +; Barred Owl, +; Ruby-throated Hummingbird, + (female); Pileated Woodpecker, +; Hairy Woodpecker, +; Downy Woodpecker, +; E. Phoebe, +; Rufous-sided Towhee, +. **Total:** 27 species; 60.5 territorial males or females (667/km², 270/100 acres). **Visitors:** Ruffed Grouse, Belted Kingfisher, Blue Jay, Com. Crow, Am. Robin, Cedar Waxwing, Com. Grackle, Am. Goldfinch. **Remarks:** Breeding activity was not observed for Ruffed Grouse this year. Carolina Wrens and Screech Owls have not been present for two seasons; this is probably due to extreme weather the past two winters. Nests located: Acadian Flycatcher, Tufted Titmouse, White-breasted Nuthatch, Wood Thrush. Brown-headed Cowbird eggs also located. I thank Tim Schumann for his assistance. This research funded by a grant from the Audubon Society of Western Pennsylvania. — *RUPERT FRIDAY, 730 Fairview Road, Pittsburgh, Pa. 15238.*

10. MOUNTAIN TOP, OAK-MAPLE FOREST. — **Location:** Pennsylvania; Westmoreland Co., 10 mi SSW or Ligonier, 6 mi S of Laughlinton in Forbes State Forest on the top of Laurel Mountain. **Continuity:** Established 1974; 5 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28:993 (1974). **Weather:** Sunny, except for one rainy day; mostly warm and clear, light wind. **Coverage:** June 3-4, 6-7, 11; 0500-0930, 1200-1300 and 1700-1930. Total party-hours: 8. **Census:** Red-eyed Vireo, 6.5 (107, 43); Scarlet Tanager, 3 (49, 20); Solitary Vireo, 2.5; E. Wood Pewee, 2; Ovenbird, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Brown Creeper, 1.5; Am. Robin, 1.5; Great Crested Flycatcher, 1; House Wren, 1; Dark-eyed Junco, 1; Chipping Sparrow, 1; Veery, 0.5; Black-throated Green Warbler, 0.5; Com. Yellowthroat, 0.5; Blue Jay, +. **Total:** 17 species; 28.5 territorial males (469/km², 190/100 acres). **Visitors:** Canada Warbler. **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 × 150 ft; one on either side of the plot but not opposite each other. This probably accounts for the higher concentration of birdlife in these specific locations and for the appearance of House Wren, Am. Robin, Com. Yellowthroat, Indigo Bunting, and Chipping Sparrow. The openings were cut by the Pennsylvania Bureau of Forestry as part of a wildlife management plan. — *R. CARRELL ABBOTT (compiler), Audubon Society of Western Pennsylvania, Pittsburgh, Pa. 15238.*

11. MATURE DECIDUOUS FLOOD-PLAIN 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; Falls Church Quadrangle, USGS. **Continuity:** Established 1947; 26 intermittent years. **Size:** 7.6 ha = 18.75 acres. **Description of Plot:** See AFN 1:212-213 (1947). **Weather:** Relatively cool, temperatures averaging 60.5°F. On a few occasions the river was high and some shore areas were under water. **Coverage:** April 1, 9, 15-16, 22, 30; May 7, 21, 29; June 4, 18, 25; between 0540-1030, EST Total man-hours: 43. **Census:** Starling, 17 (224, 91); Red-eyed Vireo, 9 (119, 48); Acadian Flycatcher, 7 (92, 37); N. Parula, 5.5 (72, 29), Downy Woodpecker, 4 (53, 21); Carolina Wren, 4; Blue-gray Gnatcatcher, 4; Am. Redstart, 4; Cardinal, 4; Carolina Chickadee, 3 (40, 16); Tufted Titmouse, 3; Great Crested Flycatcher, 2.5; Yellow-throated Warbler, 2.5, Wood Duck, 2; Red-bellied Woodpecker, 2, Brown-headed Cowbird (female), 2; Song Sparrow, 1.5; Barred Owl, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Com. Crow, 1; Brown Creeper, 1; Pileated Woodpecker, 0.5; Prothonotary Warbler, 0.5. **Total:** 24 species, 83 territorial males or females (1094/km², 443/100 acres). **Remarks:** Nests found: Starling, 12; Wood Duck, 2; Cardinal, 2; Ruby-throated Hummingbird, Pileated Woodpecker, Downy Woodpecker, Red-bellied Woodpecker, Carolina Chickadee, Tufted Titmouse, Brown Creeper, Blue-gray Gnatcatcher, Prothonotary Warbler, one each. The total of 83 pairs is higher than the 70.5 for 1977 but continues the downward trend which has been apparent since the early years of the census. For example, in 1947, the first year, there were 30 species and 608 pairs/100 acres, as compared with 24 species and 443/100 in 1978. This decrease is due to a loss of summer residents including vireos, warblers, flycatchers and thrushes. Permanent residents have shown some increase. Species no longer present are the Yellow-billed Cuckoo, E. Wood Pewee, Wood Thrush, Veery, Louisiana Waterthrush, Kentucky Warbler, Com. Yellowthroat, and Hooded Warbler. Two new species have appeared as nesters in recent years: the Brown Creeper and the Yellow-throated Warbler. Also, the Ruby-throated Hummingbird has reappeared after long absence. — *JOAN H. CRISWELL (compiler), W. H. CRAMER, J. R. GAUTHEY, Audubon Naturalist Society, 8940 Jones Mills Road, Washington, D.C. 20015.*

12. MIXED HARDWOOD FOREST. — **Location:** Maryland; Calvert Co., NW of Plum Point and 1 mi inland from Chesapeake Bay on Tobacco Rd between Routes 263 and 261. **Continuity:** Established 1960; 6 intermittent years. **Size:** 11.3 ha = 28 acres. **Description of Plot:** See AFN 13:333 (1959). **Weather:** All except one of the 15 visits were on clear days High temperatures, 66°-96°F. The creek and low areas remained wet. **Coverage:** Apr. 23, May 3, 6, 9, 13, 17, 22, 30; June 2, 9, 11, 15-16, 19-20, 23; July 1. The 7 full trips averaged 82 min. Total: 15 hours. **Census:** Red-eyed Vireo, 20 (176, 71); Wood Thrush, 10 (88, 36), Rufous-sided Towhee, 10; Hooded Warbler, 8 (71, 29); Com. Yellowthroat, 6 (53, 21); Cardinal, 6; Acadian Flycatcher, 5 (44, 18); Ovenbird, 5; Kentucky Warbler, 5; Bobwhite, 4



(35, 14), Mourning Dove, 4, Tufted Titmouse, 4, Indigo Bunting, 4, E Wood Pewee, 3 (28, 11); Am. Woodcock, 2; Red-bellied Woodpecker, 2; N. Parula, 2; Pine Warbler, 2; Yellow-breasted Chat, 2; Scarlet Tanager, 2; Summer Tanager, 2; Field Sparrow, 2; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; White-eyed Vireo, 1; Louisiana Waterthrush, 1, Am. Redstart, 1; Com. Grackle, 1; Red-tailed Hawk, +; Whip-poor-will, +; Com. Flicker, +; Downy Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Carolina Chickadee, +; Gray Catbird, +; Am. Robin, +; E. Bluebird, +; Worm-eating Warbler, +; Am. Goldfinch, +. **Total:** 41 species; 116 territorial males, (1024/km², 414/100 acres). **Remarks:** The Red-eyed Vireo repeated again as the most numerous species, and the number of territories continued to decline. The Wood Thrush and Rufous-sided Towhee were next in order at 10 territories each, both being less than last year. The Hooded Warbler was next with an increase from 5 to 8 territories. Following were the Com. Yellowthroat and Cardinal, both 6, and the latter dropped from 15 to 6 territories. This was the lowest ever recorded here for this species. Other species showing losses were Red-bellied Woodpecker, Great Crested Flycatcher, Acadian Flycatcher, Carolina Chickadee, Scarlet Tanager, Summer Tanager and Am. Goldfinch. Common species not recorded this year were Yellow-billed Cuckoo, Ruby-throated Hummingbird, Hairy Woodpecker, Yellow-throated Vireo and Brown-headed Cowbird. Species showing increases besides the Hooded Warbler were Bobwhite, Carolina Wren, Yellow-breasted Chat, Indigo Bunting and Field Sparrow. These data reflect the results of heavy logging two years ago, which has resulted in an extremely dense ground cover of weeds. Although the territorial males were less than formerly, it appears presently that some, but not all, of the normally occurring species have been reduced or eliminated from the area, while such species as Bobwhite, Yellow-breasted Chat, Indigo Bunting and Field Sparrow have increased. Webb, W.L. et al. (*Wildlife Monographs* No. 55, 1977), in logged areas in the Adirondack Mountains found that, "A few species were virtually absent in the period immediately following heavy logging, however, those species began to return after a few years as the environment began to change from brushland to young second-growth forest." They also concluded, "that logging in this type of forest does not "drive out" any breeding species," and also, "bird species diversity is increased by disturbance of the stand." — **JOHN H. FALES**, 2809 Ridge Road, Neeld Estate, Huntingtown, Md. 20639.

13. SELECTIVELY LOGGED MATURE TULIP-TREE - OAK FOREST. — **Location:** Maryland; Prince Georges Co., 6.5 mi N of Upper Marlboro; 38°55'N, 76°45'30"W, Lanham Quadrangle, USGS. **Continuity:** Established 1975; 4 consecutive years. **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AB 31: 92-93 (1977). **Coverage:** May 29; June 8, 10-11, 14, 18, 22-23, 28; July 9. **Total:** 34 man-hours. **Census:** Red-eyed Vireo, 42.5 (300, 121); Wood Thrush, 25.5 (180, 73); Cardinal, 13 (92, 37); Red-bellied Woodpecker, 12 (85, 34); Hooded Warbler, 11 (78, 31); Scarlet Tanager,

9.5 (67, 27); Acadian Flycatcher, 7.5 (53, 21); E Wood Pewee, 7.5; Yellow-throated Vireo, 6.5 (46, 19); Kentucky Warbler, 6.5; Downy Woodpecker, 5 (35, 14); Carolina Chickadee, 3.5 (25, 10); Tufted Titmouse, 3.5; White-breasted Nuthatch, 3 (21, 9); Indigo Bunting, 3; Am. Woodcock, 2; N. Flicker, 2; Great Crested Flycatcher, 2; Blue Jay, 2; White-eyed Vireo, 2; Red-tailed Hawk, 1; Hairy Woodpecker, 1; Brown Thrasher, 1; Ovenbird, 1; Mourning Dove, +; Yellow-billed Cuckoo, +; Ruby-throated Hummingbird, +; Pileated Woodpecker, +; Gray Catbird, +; Com. Yellowthroat, +; Brown-headed Cowbird, +. **Total:** 31 species; 173.5 territorial males (1225 /km², 496/100 acres). **Remarks:** Absence of Carolina Wren for the second consecutive year reflects the severe winters of 1976-77 and 1977-78. The absence of Rufous-sided Towhee may reflect last winter's severity, but also the regrowth of the forest in the openings. Conspicuous increases in some neotropical migrant species were noted [e.g. Red-eyed Vireo, Wood Thrush, Scarlet Tanager, Yellow-throated Vireo, and Kentucky Warbler]. The densities of these species in the North Tract this year compare favorably with that in the similar South Tract in 1947. It must be remembered that these two tracts represent the finest habitat in the forested continuum of the area, and would be the first to reflect upward trends in populations. — **ROBERT F. WHITCOMB** and **NANCY E. MACCLINTOCK** (compiler), 327 Scott Dr., Silver Spring, Md. 20904.

14. 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; 19 consecutive years. **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AFN 14:502-503 (1960). **Coverage:** Apr. 1, 15, 23, 30; May 20-21, 29; June 24, 26, 28; July 1, 4, 9; between 0630-2100. **Total:** 31 hrs 20 min. **Weather:** Clear on 10 trips, partly cloudy on 2, cloudy on 1; temperature 58°-88°F, averaging 72.5°; wind calm on 8 trips, to 10 mph on 4, to 46 mph on 1. **Census:** Veery, 16 (113, 46); Cardinal, 15 (106, 43); Tufted Titmouse, 10 (71, 29); Gray Catbird, 10; Carolina Chickadee, 9 (64, 26); Blue Jay, 8 (56, 23); Red-eyed Vireo, 8; Red-bellied Woodpecker, 7 (49, 20); Carolina Wren, 7; Rufous-sided Towhee, 5 (35, 14); Com. Flicker, 4 (28, 11); Downy Woodpecker, 3.5 (25, 10); Ovenbird, 3.5; Com. Crow, 3 (21, 9); Wood Thrush, 3; Com. Grackle, 3; Am. Robin, 2; Starling, 2; Mockingbird, 1.5; Screech Owl, 1; House Wren, 1; Pileated Woodpecker, 0.5. **Total:** 22 species; 123 territorial males (868/km², 351/100 acres). **Visitors:** (found irregularly in the area within their breeding period and known to breed in the vicinity): Mallard, Mourning Dove, Yellow-billed Cuckoo, Black-billed Cuckoo, Chimney Swift, E. Wood Pewee, Fish Crow, White-breasted Nuthatch, Yellow-throated Vireo, Warbling Vireo, Com. Yellowthroat, Am. Redstart, House Sparrow, Brown-headed Cowbird, Scarlet Tanager. **Remarks:** Coverage was relatively low and left gaps in the middle of both May and June, so these records may not be closely comparable with those of previous years. Last year we thought the total numbers might reflect the previous very cold winter; this season followed another unusually severe winter which might

have decreased year-around residents. Total species, 45 in 1960, with 206 males, were down to 27 species by 1973, 25 last year, and 22 now. Territorial males have also dropped by more than half from the high of 220.5 in 1972, but until recent extreme weather, the increase of permanent residents had somewhat countered the steady drop in species that winter in the south. Carolina Wrens rallied this year; after 14 pairs in 1976, they dropped to 6 last year, then back up to 7 this year despite another severe winter. Towhees were down from 11 to 5, Downy Woodpeckers from 6 to 3.5, and the Starlings continued a decline since their high of 25 in 1970 (25, 19, 19, 21, 17, 17, 13, 6, 2). Among the migrants whose numbers have declined in the last several years, three showed some gain: Wood Thrush up to 3 after being absent last year, Red-eyed Vireo up to 8 from 4, with 10 the 20-year average, and Ovenbird up to 3.5 after being either 1, +, or visitor since 1969. The high was 5 in 1962. Why these alone remain of the 8 species of warblers that once nested here regularly is puzzling. Flycatchers were all missing except for a visiting pewee. — **SHIRLEY A. BRIGGS** (compiler), **JAMES DEANE**, **OLIVE HOLBROOK**, **CHRIS REID**, **DON WEBER**, 7605 Honeywell Lane, Bethesda, Md. 20014.

15. MIXED OAK FOREST. — **Location:** Virginia, Rockingham Co.; 3.25 mi SE of Mauzy, E of state road 620; 38°32'5", 78°41'50", Tenth Legion Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Second-growth forest of intermediate maturity, uniformly dominated by oak species except for several recently cut areas which are dominated by Virginia Pine (*Pinus virginiana*) and several other early successional tree species. Most prominent in the understory are Red Maple (*Acer rubrum*) and *Sassafras albidum*. The ground cover is primarily blueberry (*Vaccinium* sp.), Honey-suckle (*Lonicera japonica*) and Virginia Creeper (*Parthenocissus quinquefolia*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 353/acre; total basal area 102.3 ft²/acre. Species comprising 90% of the total number of trees: N. Red Oak (*Quercus rubra*), 60, 17, 20, 67; Black Oak (*Q. velutina*), 42, 12, 17, 83; White Oak (*Q. alba*), 52, 15, 16, 100; Chestnut Oak (*Q. prinus*), 53, 15, 15, 83; Virginia Pine, 52, 15, 7, 67; dead trees, 28, 8, 7, 67; Tulip-tree (*Liquidambar styraciflua*), 3, 1, 5.6, 33; hickory (*Carya* sp.), 8, 2, 2.6, 17; Flowering Dogwood (*Cornus florida*), 7, 2, 1, 8, 33; Black Gum (*Nyssa sylvatica*), 12, 3, 1.5, 50. Trees by diameter size class: A (3-6 in.) 202, 57, 20, 20; B (6-9 in.) 83, 24, 25, 24; C (9-15 in.) 65, 18, 52, 51; E (21-27 in.) 2, 1, 5, 5. Shrub stems/acre 5025; ground cover 29%, canopy cover 75%; averaging canopy height 67 ft (range 27-84). **Edge:** Like habitat extends on all sides except an open field located approximately 30 m from the W edge. **Topography:** Gentle W-facing slope at the foot of Massanutten Mountain. **Elevation:** 1260-1400 ft. **Weather:** Cool and moist contrasting sharply with spring 1977. **Coverage:** May 17, 23-24, 26-28, 31; June 2, 6-7, 10; between dawn and 0800 hours except two trips between 1700 and dusk. **Total party-hours:** 19.5. **Census:** Red-eyed Vireo, 3.5 (58, 23); E. Wood Pewee, 2,

Blue-gray Gnatcatcher, 2, Cardinal, 2, Rufous-sided Towhee, 2, Scarlet Tanager, 1, Great Crested Flycatcher, 0.5; Broad-winged Hawk, +; Yellow-billed Cuckoo, +; Red-bellied Woodpecker, +; Downy Woodpecker, +, Blue Jay, +; Com. Crow, +; Fish Crow, +; Carolina Chickadee, +; Tufted Titmouse, +; Louisiana Waterthrush, +; Com. Grackle, +. **Total:** 18 species; 13 territorial males (214/km², 87/100 acres). **Visitors:** Acadian Flycatcher, Wood Thrush, Veery, Blackburnian Warbler, Pine Warbler, Com. Yellowthroat, Brown-headed Cowbird. **Remarks:** Considering the maturity of the forest and the favorable weather conditions, we found our plot less productive than expected. We particularly noted the lack of nesting thrushes, chickadees, and nuthatches. A fairly late spring following a uniformly cold winter delayed migration and concentrated it into a shorter than normal period. This may have also delayed nesting for some birds, such as the thrushes, which we noted in the area but were not breeding. Special thanks to Glen Phillips, Kathleen Finnegan, Dick and Mary Smith, and all the Rockingham Bird Club who helped sponsor this project. — ELLEN J. GOETZ and A. CLAIR MELLINGER, *Eastern Mennonite College, Harrisonburg, Va. 22801.*

16. OAK - HICKORY FOREST. — **Location:** Virginia; Augusta Co., 2.6 mi E of Weyers Cave on State 256 and 1.3 mi N on County 772; 38°16'15"N, 78°52'15"W, Grottoes Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Hardwood forest cut prior to 1925. For many years this plot was openly grazed by cattle; in 1967 it was fenced off and a new understory has emerged. The dominant canopy trees are White Oak (*Quercus alba*), Red Oak (*Q. rubra*) and Pignut Hickory (*Carya glabra*). Most prominent in the understory are Flowering Dogwood (*Cornus florida*) and seedlings of the dominant canopy trees. The ground cover is primarily May-Apple (*Podophyllum peltatum*) and Japanese Honeysuckle (*Lonicera japonica*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six circular samples, 206/acre; total basal area 83 ft²/acre. Species comprising 90% of the total number of trees: White Oak 37, 18, 26.7, 100; Red Oak 40, 20, 23.8, 100; Pignut Hickory 32, 15, 17, 83; Black Oak (*Q. velutina*) 27, 13, 11, 83; Red Maple (*Acer rubrum*) 20, 10, 4.9, 50; Shagbark Hickory (*C. ovata*) 10, 5, 4.4, 67; Slippery Elm (*Ulmus rubra*) 3, 1.6, 2.1, 17; Wild Cherry (*Prunus serotina*) 13, 6.5, 2, 50; and dead trees, 7, 3, 2.5, 50. Trees by diameter size class: A (3-6 in.) 92, 45, 9.3, 11.1; B (6-9 in.) 48, 23, 14.5, 17.5; C (9-15 in.) 57, 28, 45.3, 54.7; D (15-21 in.) 8, 4, 15, 18. Shrub stems/acre 5583; ground cover 19%; canopy cover 84%; average canopy height 67 ft (range 56-78). **Edge:** On the S side, the forest continues. The remaining sides have at least a 65 ft buffer strip and then are bordered by grassy pasture. **Topography:** Gentle rolling from N to S with three shallow gullies which are runoffs for the pasture land. **Elevation:** 1150 ft. **Weather:** Variable; clear to overcast. Temperature range 52°-72°. No rain. **Coverage:** May 18, 23-25, 27-31; June 2-5, 7-8; 0545-0810. Total man-hours: 30. **Census:** Tufted Titmouse, 3.5 (58, 23); Great Crested

Flycatcher, 3 (49, 20), Yellow-billed Cuckoo, 1.5, Chimney Swift, +, Com. Flicker, +, Pileated Woodpecker, +; Red-bellied Woodpecker, +; Downy Woodpecker, +; Blue Jay, +; Com. Crow, +; Fish Crow, +; Com. Grackle, +; Brown-headed Cowbird, +; Cardinal, +. **Total:** 14 species; 8 territorial males (132/km², 53/100 acres). **Visitors:** Bobwhite, E. Wood Pewee, Wood Thrush. **Remarks:** This plot represents an island in the middle of pasture and farm land, typical for much of the country. Our results were as expected for this habitat. Special thanks to Elwood Fisher and Clair Mellinger for assistance with the vegetative survey and to Leonard Teuber and other members of the Rockingham Bird Club for assistance with the census. — CHARLES ZIEGENFUS (compiler), *Mathematics Dept., James Madison Univ., Harrisonburg, Va. 22807.*

17. OAK-HICKORY-TULIP-TREE FOREST. — **Location:** Virginia; Amherst Co., 0.4 mi NW of intersection of U.S. Route 29 and Sweet Briar College entrance road; 37°33'N, 79°04'W, Amherst 7.5' Quadrangle, USGS. **Continuity:** New. **Size:** 13.5 ha = 33.3 acres (roughly rectangular, surveyed, gridded). **Description of Plot:** The dominant canopy trees are White Oak (*Quercus alba*) and Tulip-tree (*Liriodendron tulipifera*) overall, with Am. Beech (*Fagus grandifolia*) a co-dominant in some ravines and on a rather steep N-facing slope, and Black Gum (*Nyssa sylvatica*) and hickories important on the gentle S-facing slopes. The most important small tree is the Flowering Dogwood (*Cornus florida*), along with many small, immature trees of canopy species. Pink Azalea (*Rhododendron nudiflorum*), Am. Strawberry-bush (*Euonymus americanus*), and Tall Deerberry (*Vaccinium stamineum*) are important shrubs, although they are irregularly clumped. Ground cover is primarily Japanese Honeysuckle (*Lonicera japonica*). A quantitative survey of the vegetation gave the following results: Trees 3 in. in diameter and over, based on five 20-meter quadrat samples, 190/acre; total basal area 54.8 ft²/acre. Species constituting 100% of the total number of trees (figures after each species indicate number of trees/acre; relative density (%); relative dominance (%); frequency (%), in that sequence): Tulip-tree 34, 18, 20, 80; Black Gum 34, 18, 11, 100; Mockernut Hickory (*Carya tomentosa*) 22, 12, 9, 60; Pignut Hickory (*C. glabra*) 18, 9, 5, 60; Am. Beech 16, 9, 19, 60; White Oak 12, 7, 16, 40; Red Maple (*Acer rubrum*) 12, 6, 4, 60; Red Oak (*Q. rubra*) 10, 5, 9, 60; dead trees 10, 5, 1, 80; Shagbark Hickory (*C. ovata*) 6, 3, 1, 60; Dogwood 4, 2, 1, 40; Black Locust (*Robinia pseudoacacia*) 4, 2, 1, 20; ash (*Fraxinus* sp.) 2, 1, 1, 20; Black Oak (*Q. velutina*) 2, 1, 1, 20; Post Oak (*Q. stellata*) 2, 1, 1, 20; *Sassafras albidum* 2, 1, 1, 20. Kinds of plants, and density, in the shrub and herb layers varied greatly from quadrat to quadrat. 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.) 90, 47, 9, 8; B (6-9 in.) 40, 21, 12, 11; C (9-15 in.) 36, 19, 29, 26; D (15-21 in.) 14, 8, 25, 23; E (21-27 in.) 8, 4, 25, 23; F (27-33 in.) 2, 1, 10, 9. Shrub stems/acre, 3196; ground cover, 41%; canopy cover, 77%; average canopy height, 90 ft (range 80-110 ft).

Edge: Bordered almost all around by similar forest, but the SE boundary is close to a large yard and farther away a pasture, while an 80 m portion of the W edge is bordered by lawn, a college building, and a parking area; a 30 ft wide EW paved road, with 1520 ft mowed, grassy border on each side and utility poles and lines on one side, bisects the area. **Topography:** A gentle S-facing slope up to about the midline, with E and W slopes dropping off from this; a steep N-facing slope drops off to a stream and a gentle S-facing slope rises from the stream to the N boundary of the plot. **Elevation:** 720-800 ft. **Coverage:** Apr. 22; May 19, 22, 24-25; June 2, 6, 8, 13, 15, 20, 22, 27, 29; July 22; 0630-1000 hours. Total man-hours: 25. **Weather:** Warm, mostly sunny, in May; warm to hot, often cloudy, in June and July. **Census:** Wood Thrush, 8.5 (63, 26); Scarlet Tanager, 4.5 (33, 14); Tufted Titmouse, 4 (30, 12); Cardinal 3.5 (26, 11); Acadian Flycatcher, 3 (22, 9); Red-eyed Vireo, 2.5; Com. Flicker, 2; Red-bellied Woodpecker, 2; Yellow-billed Cuckoo, 1.5; E. Wood Pewee, 1.5; Whip-poor-will, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Brown-headed Cowbird, 1; Summer Tanager, 0.5. **Total:** 17 species; 39.5 territorial males or females (293/km², 119/100 acres). **Visitors:** Great Horned Owl, Ruby-throated Hummingbird, Pileated Woodpecker, Hairy Woodpecker, Downy Woodpecker, Carolina Wren, Mockingbird, Catbird, Am. Robin. **Remarks:** The number of Wood Thrushes seemed to have declined somewhat from last year, while the number of Scarlet Tanagers seemed to have increased. Three nests were found Whip-poor-will; Com. Flicker; Summer Tanager. — MARY JANE BERRY, MICHAEL BOATWRIGHT, RAY CHANDLER, ERNEST P. EDWARDS (compiler), CATHERINE HAROLD, *Sweet Briar College, Sweet Briar, Va. 24595.*

18. RED MAPLE-BLACK GUM MIXED HARDWOODS. — **Location:** Virginia Nansemond Co., Great Dismal Swamp National Wildlife Refuge, on W side of Brown's Ditch 0.5 mi S of intersection with Jericho Ditch Rd, City of Suffolk. **Continuity:** New. **Size:** 10.1 ha = 25 acres (square, surveyed). **Description of Plot:** Trees, 3 inches in diameter and over, based on 20 0.1 acre circular samples, 193.5/acre; total basal area 236.2 ft²/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): Red Maple (*Acer rubrum*), 97, 50, 64, 100; Black Gum (*Nyssa sylvatica*), 69, 36, 24, 100; Red Bay (*Persea borbonia*) 19.5, 10, 6, 65. Trees by diameter size class (figures after each class give number of trees/acre, relative density %, basal area in ft²/acre, relative dominance): A (3-6 in.) 56.5, 29, 14, 15; B (6-9 in.) 52, 27, 31, 21; C (9-15 in.) 63.5, 33, 99.5, 42; D (15-21 in.) 20.5, 10, 80.4, 20; E (21-27 in.) 1.5, 1, 11.14, 2. Shrub stems/acre 2290, ground cover 45%; average canopy height 45 ft (range 20-60). **Edge:** Surrounded on all sides by similar habitat — nearest "edge effect" .50 miles from N edge. **Topography:** Hummocky-flat, elevation 20 ft. **Weather:** Warm and humid with evening thunder storms occurring throughout 60% of the census period. **Coverage:** Apr. 20-21, 25; May 2, 5, 12, 22, 25, 30,

0530-0900 Total man-hours 315 **Census:** Prothonotary Warbler, 13 (128, 52), Com Yellowthroat, 8 (79, 32); Wood Thrush, 6 (59, 24), Ovenbird, 5 (49, 20); Louisiana Waterthrush, 5; Hooded Warbler, 5; Carolina Wren, 4 (40, 16); Yellow-billed Cuckoo, 3 (30, 12), Carolina Chickadee, 3; Red-eyed Vireo, 3, Great Crested Flycatcher, 2; Mourning Dove, 1; Blue-gray Gnatcatcher, 1; Pine Warbler, 1; Red-shouldered Hawk, +; Barred Owl, +; Pileated Woodpecker, +; Downy Woodpecker, +; Swainson's Warbler, +; Summer Tanager, +; Rufous-sided Towhee, +, Chipping Sparrow, +. **Total:** 22 species; 60 territorial males or females (593/km², 240/100 acres). **Visitors:** Chimney Swift, Com. Flicker, Fish Crow, Am. Robin, Black-and-white Warbler, Blue-winged Warbler, Cardinal. **Remarks:** Eleven nests were found: Prothonotary Warbler, 7; Ovenbird, 1; Mourning Dove, 1; Chipping Sparrow, 1. This spring has been wetter than the past 2 or 3 with an average 2 in. more rain. I thank my fellow employees at Dismal Swamp National Wildlife Refuge and the Dismal Swamp Young Adult Conservation Corps Camp for all their valuable help and advice. — *DON SCHWAB, 2233 Whitmarsh Road, Suffolk, Va 23434.*

19. UPLAND OAK-HICKORY FOREST.

— **Location:** Virginia; Fairfax Co., Dranesville District Park, McLean, along Route 193 (Old Georgetown Pike), approximately ¾ mi E of Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 11 ha = 27.2 acres. **Description of Plot:** See AB 25:636 (1971). **Weather:** Generally clear, with no extremes of temperature or wind; light rain on 2 trips. Temperatures: 39-78°. **Coverage:** Apr. 2-5, 7, 9, 11-12, 14, 17-18, 21-22, 24, 28-29; May 5, 9-10, 18-19; June 2, 3, 6-7, 8, 10-11, 16-18, 28; July 8; between 0515-1115, EDT. Total party-hours: 53:45. **Census:** Red-eyed Vireo, 13 (118, 48); Wood Thrush, 8.5 (77, 31); Carolina Chickadee, 7 (64, 26); Brown-headed Cowbird, 7; Scarlet Tanager, 6.5 (59, 24); Cardinal, 6 (55, 22); Tufted Titmouse, 5 (45, 18); White-breasted Nuthatch, 4.5 (41, 17); Downy Woodpecker, 4 (36, 15); Blue Jay, 4; Red-bellied Woodpecker, 3.5 (32, 13); Brown Creeper, 3.5; Hairy Woodpecker, 3 (27, 11); E. Wood Pewee, 3; Ovenbird, 3; Mourning Dove, 2.5, Acadian Flycatcher, 2; Blue-gray Gnatcatcher, 1.5; Worm-eating Warbler, 1.5; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Kentucky Warbler, 1; Hooded Warbler, 1; Louisiana Waterthrush, 0.5. **Total:** 24 species, 93.5 territorial males (849/km², 344/100 acres). **Visitors:** Turkey Vulture, Sharp-shinned Hawk, Red-tailed Hawk, Com. Flicker, Com. Crow, Carolina Wren, Am. Robin, Yellow-throated Vireo, Com. Grackle, Am. Goldfinch. Nests found: Red-bellied Woodpecker, 2, Blue Jay 2, White-breasted Nuthatch 1, Worm-eating Warbler 1. — *G. H. ESPENSHADE, KEITH GUTHRIE, BILL PER-LEE, ROBERT J. WATSON (compiler), 2636 Marcey Road, Arlington, Va. 22207.*

20. 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; 5 con-

secutive years **Size:** 206 ha = 509 acres **Description of Plot:** See AB 28 701-2, 1003-4 (1974). **Weather 1977:** March was warmer than normal with average precipitation; April through July had normal temperatures, but precipitation was below normal. **Coverage 1977:** Mar. 30-31; Apr. 6, 10-12, 15-17; May 12-13, 18, 20, 26-27, 29-30; July 1-2, 4; July 1, 20. Total man-hours: 29.1. **Census:** Blue Jay, 5 (24, 10); Wood Thrush, 5; E. Wood Pewee, 4 (19, 8); Carolina Chickadee, 4; Tufted Titmouse, 4; Red-eyed Vireo, 4; Downy Woodpecker, 3 (15, 6); Great Crested Flycatcher, 3; Cardinal, 3; Red-bellied Woodpecker, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Brown-headed Cowbird, 2; Scarlet Tanager, 2; Broad-winged Hawk, 1; Com. Flicker, 1; Acadian Flycatcher, 1; Com. Crow, 1; Starling, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Kentucky Warbler, 1; Chipping Sparrow, 1. **Total:** 23 species; 54 territorial males (262/km², 106/100 acres). **Remarks:** Nests located: Downy Woodpecker, 1; Blue Jay, 3; Carolina Chickadee, 1; Tufted Titmouse, 1; Wood Thrush, 4; Starling, 1; Cardinal, 2. A 13% decrease in territorial males from 1976 resulted from the absence of Carolina Wrens and Worm-eating Warblers this year compared to 5 and 3 territorial males, respectively, last year. **Weather 1978:** From 15 April through 8 May, temperatures remained below normal. All-day rain occurred 13 May through 16 May. During summer months, precipitation was regular and greater than normal. **Coverage 1978:** Apr. 9, 21, 29; May 21, 25, 29-30; June 1, 5, 8, 11, 19, 23; July 6. Total man-hours: 24.2. **Census:** Blue Jay, 5 (24, 10); E. Wood Pewee, 4 (19, 8); Tufted Titmouse, 4; Am. Robin, 4; Wood Thrush, 4; Brown-headed Cowbird, 4; Cardinal, 4; Com. Flicker, 3 (15, 6); Great Crested Flycatcher, 3; Carolina Chickadee, 3; Ovenbird, 3; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Rufous-sided Towhee, 2; Com. Crow, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1; Scarlet Tanager, 1. **Total:** 20 species; 55 territorial males (267/km², 108/100 acres). **Remarks:** Nests located: Cardinal, 3; Com. Flicker, 2; Wood Thrush, 2; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Tufted Titmouse, 1. The absence of Carolina Wrens continued. A single bird was detected on Apr. 9, 21, and 26, after which it disappeared. — *JOAN C. and PAUL W. WOODWARD, 2433 Southgate Sq., Reston, Va. 22091.*

21. FLOODPLAIN FOREST. — **Location:** North Carolina; Orange Co., within the University of N.C. Mason Farm Reserve, locally known as Big Oak Woods, 3 mi SE of the center of Chapel Hill; 35°53'N, 79°0'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 13 ha = 32.1 acres. **Description of Plot:** See AB 32:63 (1978). **Coverage:** 9 visits between Mar. 27 and June 6; between dawn and 0945 hours. Total party-hours: 18. **Census:** Red-eyed Vireo, 14 (108, 44); Acadian Flycatcher, 11 (85, 34); Tufted Titmouse, 7 (54, 22); Blue-gray Gnatcatcher, 6.5 (50, 20); Cardinal, 6.5; Wood Thrush, 5.5 (42, 17); Carolina Wren, 4.5 (35, 14); Red-bellied Woodpecker, 3.5 (27, 11); Yellow-throated Vireo, 3 (23, 9); Downy Woodpecker, 2.5; Scarlet Tanager, 2.5; Carolina Chickadee, 2; Kentucky Warbler, 1.5; Yellow-billed

Cuckoo, 1, Ruby-throated Hummingbird, 1, Hairy Woodpecker, 1, White-breasted Nuthatch, 1; N. Parula, 1; Ovenbird, 1; Red-tailed Hawk, +; Bobwhite, +; Am. Woodcock, +; White-eyed Vireo, +; Com. Grackle, +; Rufous-sided Towhee, +. **Total:** 5 species; 76 territorial males (585/km², 237/100 acres). **Visitors:** Yellow-throated Warbler, Yellow-breasted Chat, Summer Tanager. **Remarks:** 5 nests were found: Acadian Flycatcher (2), Tufted Titmouse (2), Red-tailed Hawk. Populations decreased considerably since last year, with Carolina Chickadees, Carolina Wrens, Hooded Warblers, and Summer Tanagers showing the greatest declines. — *M. CROTTEAU, C. DAL MOLIN, S. HALL (co-compiler), T. HERBERT, D. KENNEDY, L. MOORE, H. MUELLER (co-compiler), M. SCHULTZ, B. SIMPSON, J. WHITEHEAD, H. WILSON; Dept. of Zool., Univ. of North Carolina, Chapel Hill, N.C. 27514.*

22. MIXED DECIDUOUS FOREST. — **Location:** North Carolina; Orange Co., partly within the research area of the N.C. Botanical Garden, 2.5 mi SE of the center of Chapel Hill; 35°31'N, 79°01'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1976, 3 consecutive years. **Size:** 12.55 ha = 31 acres **Description of Plot:** See AB 31:41 (1977) **Coverage:** 9 visits between Mar. 22 and June 14; between dawn and 0900 hours. Total party-hours: 18. **Census:** Red-eyed Vireo, 9 (72, 29); Tufted Titmouse, 8 (64, 26); Wood Thrush, 7 (56, 23); Carolina Chickadee, 5 (40, 16); Cardinal, 5; Red-bellied Woodpecker, 4 (32, 13); Blue-gray Gnatcatcher, 3 (24, 10); Ovenbird, 3; Scarlet Tanager, 2.5; Summer Tanager, 2.5; Downy Woodpecker, 2; Carolina Wren, 2; Yellow-throated Vireo, 2; Pine Warbler, 2; Kentucky Warbler, 2; Mourning Dove, 1; Ruby-throated Hummingbird, 1, Hairy Woodpecker, 1; Acadian Flycatcher, 1, E. Wood Pewee, 1; White-breasted Nuthatch, 1; Com. Flicker, 0.5; Great Horned Owl, +, Pileated Woodpecker, +; Blue Jay, +; Com. Crow, +; Brown-headed Cowbird, +. **Total:** 27 species; 65.5 territorial males (522/km², 211/100 acres). **Visitors:** Yellow-billed Cuckoo, Great Crested Flycatcher, Com. Grackle. **Remarks:** A Wood Thrush nest was found. Populations were the lowest in 3 years, with Carolina Wrens, Red-eyed Vireos and Hooded Warblers showing the greatest reductions. — *M. CROTTEAU, C. DAL MOLIN, S. GIDUZ, S. HALL (co-compiler), T. HERBERT, H. MUELLER (co-compiler), B. SIMPSON, J. WHITEHEAD; Dept. of Zool., Univ. of North Carolina, Chapel Hill, N.C. 27514.*

23. MIXED DECIDUOUS FOREST. — **Location:** North Carolina; Orange Co., 4.5 mi N of Chapel Hill on N.C. Highway 86; Duke Forest Natural Area; 35°59'N, 79°04'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 8.8 ha = 21.8 acres. **Description of Plot:** See AB 27:1018-1019 (1973). **Weather:** Unusually cold winter and wet spring. **Coverage:** May 10, 17, 19, 23, 26; June 1, 13, 16, 20, 28; 0615-0845. Total party-hours: 18. **Census:** Red-eyed Vireo, 15.5 (176, 71); Acadian Flycatcher, 10 (113, 46); Ovenbird, 7.5 (85, 34); Tufted Titmouse, 3.5 (40, 16); Wood Thrush, 3 (34, 14); Louisiana Waterthrush, 3; Carolina Chickadee, 2; Red-bellied Woodpecker, 1.5,

Hairy Woodpecker, 15, Scarlet Tanager, 15, Downy Woodpecker, 1, Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; N. Parula, 1; Brown-headed Cowbird, 1; Cardinal, 1; Red-tailed Hawk, +; Broad-winged Hawk, +; Yellow-billed Cuckoo, +; Blue Jay, +, Com. Crow, +; Pine Warbler, +; Com. Grackle, +; Summer Tanager, +. **Total:** 24 species; 55 territorial males (623/km², 252/100 acres). **Visitors:** Ruby-throated Hummingbird, Am. Goldfinch. **Remarks:** Four nests were located: Ovenbird 2, Hairy Woodpecker 1, Louisiana Waterthrush 1. The second consecutive summer drought and winter cold last year eliminated Carolina Wren this year (1.5 males in 1977, 6.5 in 1976). Peripheral species appearing more frequently this year included Red-tailed Hawk, Broad-winged Hawk, and Blue-gray Gnatcatcher. — **DOUGLAS BRAME, CHARLIE SAUNDERS, JOHN HORN (compiler), Dept. of Botany, Duke Univ., Durham, N.C. 27706.**

24. 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; 10 consecutive years. **Size:** 5.9 ha = 14.7 acres. **Description of Plot:** See *AFN* 23:710-711 (1969). The only perceptible change in the forest cover in the last year is the falling of two large trees due to a storm. **Coverage:** Mar. 23; Apr. 5-6, 9, 14, 23, 30; May 3, 7, 10, 14, 20, 23, 28, 31; June 4, 10, 14, 18, 21, 25; between daylight and 1900. Total man-hours: 56. **Census:** Red-eyed Vireo, 8 (134, 54); Black-throated Green Warbler, 7 (118, 48); Hooded Warbler, 6 (101, 41); Worm-eating Warbler, 4 (67, 27); Acadian Flycatcher, 3 (50, 20); Tufted Titmouse, 3; Cardinal, 3; Carolina Chickadee, 2; Black-and-white Warbler, 2; Scarlet Tanager, 2; Yellow-billed Cuckoo, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Red-shouldered Hawk, +; Ruffed Grouse, +; Com. Flicker, +; Wood Thrush, +. **Total:** 23 species; 49 territorial males (824/km², 333/100 acres). **Remarks:** This is the only census in 10 years on which were no records of Swainson's Warbler, Downy and Hairy Woodpeckers were not noted this year. Assistance was given on one or two trips by Anne Bailey, Marie Mellinger, Caroline G. Newhall, Dick Parks, Louis Schweizer, C. C. Stringer and R. C. Stringer. — **E. O. MELLINGER, Tiger, Ga. 30576.**

25. MIXED DECIDUOUS FOREST. — **Location:** Ontario; Peel Co., Mississauga, 1 mi W of Mississauga City Centre, 43°35'35"N, 79°38'02"W. **Continuity:** New. **Size:** 36.4 ha = 90.0 acres (from aerial photo). **Description of Plot:** Nearly rectangular, low lying woodland. The soil is a shallow clay overlying shaley till. The plot is presently being developed as a residential subdivision but ten acres of the more mature vegetation is to remain as natural parkland. The dominant canopy trees are Shagbark Hickory (*Carya ovata*), White and Red Oaks (*Quercus alba* and *rubra*), Sugar Maple (*Acer saccharum*) and White and Green Ashes (*Fraxinus americana* and *pennsylvanica* var. *subintegerrima*). The main understory species were White Ash, Hop Hornbeam (*Ostrya virginiana*), Red-panicle

Dogwood (*Cornus racemosa*) and hawthorns (*Crataegus* spp.) The principal ground cover plants were grasses, Poison Ivy (*Rhus radicans*), tree seedlings, Enchanter's Nightshade (*Circaea quadrifidulcata*) and Wild Geranium (*Geranium maculatum*). A quantitative survey of the vegetation was done using six 0.1 acre samples in the manner of James and Shugart. Trees 3 in. in diameter and over, 347.2/acre; total basal area, 140.3 ft²/acre; species comprising 97% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, and frequency, in that order): Shagbark Hickory, 85, 24, 17, 100; Sugar Maple, 48, 14, 8, 50; dead, 46, 13, 18, 100; White and Green Ash, 42, 12, 13, 100; Hop Hornbeam, 29, 8, 2, 83; White Oak, 16, 5, 12, 33; Red Oak, 14, 4, 17, 33; Beech (*Fagus grandifolia*), 13, 4, 3, 17; Hawthorns, 11, 3, 1, 50; Red Maple (*A. rubrum*), 10, 3, 2, 33; Basswood (*Tilia americana*), 10, 3, 1, 17; Black Ash (*F. nigra*), 10, 3, 1, 33; Swamp Oak (*Q. bicolor*), 5, 1, 3, 33. Trees by diameter size class: A (3-6 in.) 179, 52, 14, 100; B (6-9 in.) 98, 28, 21, 100; C (9-15 in.) 53, 15, 30, 100; D (15-21 in.) 11, 3, 14, 50; E (21-27 in.) 3, 1, 7, 33; F (27-33 in.) 2, 0.5, 6, 17; G (33-40 in.) 2, 0.5, 8, 17. Woody stems/acre, 30,800; Ground cover, 85% (range 60-100%); Canopy cover, 55% (range 30-75%); Canopy height, 62 ft. (range 45-72 ft.). **Edge:** Half surrounded by hydro and hay fields, and half by old fields dominated by Hawthorns. **Topography:** Nearly flat. **Elevation:** 500-523 ft. **Weather:** Virtual drought. **Coverage:** May 30; June 2-3, 6, 8, 10-12, 18, 20, 23-25, 27-28, 30; July 5-8; between 0615-1030 hrs. Total man-hours: 70.5. **Census:** Song Sparrow, 10 (27, 11); Gray Catbird, 9 (25, 10); Blue Jay, 7 (19, 8); Am. Robin, 7; Red-winged Blackbird, 6 (16, 7); Am. Goldfinch, 6; Black-capped Chickadee, 5 (14, 6); Starling, 5; Brown Thrasher, 4 (11, 4); N. Oriole, 4; Com. Grackle, 4; Brown-headed Cowbird, 4; Rose-breasted Grosbeak, 4; Mourning Dove, 2; Com. Flicker, 2; E. Kingbird, 2; Great Crested Flycatcher, 2; Willow Flycatcher, 2; Alder Flycatcher, 2; E. Wood Pewee, 2; White-breasted Nuthatch, 2; House Wren, 2; Wood Thrush, 2; Cedar Waxwing, 2; Yellow Warbler, 2; House Sparrow, 2; Downy Woodpecker, 1.5; Black-billed Cuckoo, 1; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Tree Swallow, 1; Com. Crow, 1; Red-eyed Vireo, 1; Mourning Warbler, 1; Cardinal, 1; Indigo Bunting, 1. **Total:** 36 species; 111.5 territorial males or females (306/km², 124/100 acres). **Remarks:** The census is part of the author's Ph.D. thesis which analyzes the effects of urbanization on bird communities. I thank especially Reid Barclay for his assistance, Adam Dimuantes for recording botanical data, and Dick Blyleven for his support. — **ARNIE GOTFRYD, Dept. of Zool., Univ. of Toronto, Toronto, Ont., Canada, M5S 1A1.**

26. 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; 9 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See *AB* 25:993 (1971). **Coverage:** May 28, 31; June 1-2, 6, 8, 14, 16-17, 19, 21-24; July 7; 0645-1000; once 1800-1915. Total man-hours: 20.75. **Weather:** 3 days cloudy-rainy, 12 days sunny. Temperature: 47°-69°F (ave. 59°). **Cen-**

sus: Am Robin, 6 (30, 12), Great Crested Flycatcher, 5 (25, 10), Blue Jay, 5, Com Grackle, 5; Wood Thrush, 4 (20, 8); Cardinal, 4; Red-winged Blackbird, 3 (15, 6); Starling, 2; N. Oriole, 2; Indigo Bunting, 2; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Red-eyed Vireo, 1; Brown-headed Cowbird, 1. **Total:** 15 species; 43 territorial males (215/km², 87/100 acres) **Remarks:** The southern 400 m (lengthwise) of the area was subject to almost continuous daily noise pollution from the nearby quarry, that, judged by former years, reduced the numbers of Wood Thrush, Cardinal, and Indigo Bunting, and eliminated the Song Sparrow. A male Magnolia Warbler was seen singing in one spot for 3 consecutive days in late June. — **ERIC NASMITH (compiler), 28 Donwoods Drive, Toronto, Ont., Canada M4N 2G1.**

27. MATURE ASPEN FOREST. — **Location:** Minnesota; Itasca Co., SE-¼, Sec. 22, T57N, R25W; Wabana Lake Quad., USGS **Continuity:** New. **Size:** 8.7 ha = 21.5 acres **Description of Plot:** Dominant canopy species is Aspen (*Populus tremuloides*). Other species include Paper Birch (*Betula papyrifera*), Sugar Maple (*Acer saccharum*) and Red Maple (*A. rubrum*). The understory is composed of Mountain Maple (*A. spicatum*), Alternate-leaf Dogwood (*Corylus cornuta*), *Prunus* spp. and *Amelanchier* spp. **Edge:** Bordered on N by similar vegetation. The W and E borders are fallow hayfields and a paved road borders the S. **Topography:** Essentially flat. **Elevation:** 1420 ft. **Coverage:** May 26, June 2, 9, 19-20, 26-27; 0530-0930 hrs. Total man-hours: 26. **Census:** Least Flycatcher, 23 (270, 109); Ovenbird, 13.5 (155, 63); Red-eyed Vireo, 11.5 (132, 53); Veery, 8 (92, 37); Chestnut-sided Warbler, 3 (34, 14); Am. Redstart, 2; Broad-winged Hawk, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1, White-breasted Nuthatch, 1; Philadelphia Vireo, 1; Mourning Warbler, 1; N. Oriole, 1, Brown-headed Cowbird, 1; Com. Flicker, 0.5, Am. Robin, 0.5; Ruby-throated Hummingbird, +; Pileated Woodpecker, +; Yellow-bellied Sapsucker, +; Hairy Woodpecker, +, Downy Woodpecker, +; Blue Jay, +; Cedar Waxwing, +; Scarlet Tanager, +; Rose-breasted Grosbeak, +. **Total:** 25 species; 70.5 territorial males (810/km², 328/100 acres) — **DONALD RUKSTAD and JOHN R PROBST, North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.**

28. ASPEN - BIRCH FOREST. — **Location:** Minnesota; Carlton Co., in the Cloquet Forestry Center, Univ. of Minnesota, SE¼, Sec. 32, T49N, R17W; Iverson Quadrangle, USGS. **Continuity:** A smaller, more uniform sub-plot of the area censused in 1977. **Size:** 14.0 ha = 34.6 acres. **Description of Plot:** See *AB* 32:65 (1977). A logging operation began this year outside the E border. **Coverage:** May 23-24, 31; June 1, 6, 13, 21, 28; 0530-0930 hrs Total man-hours: 29.5. **Census:** Ovenbird, 11.5 (82, 33); Chestnut-sided Warbler, 8 (57, 23); Least Flycatcher, 7.5 (54, 22); Veery, 7.5, Red-eyed Vireo, 7.5; Mourning Warbler, 5 (36, 14); Red-breasted Nuthatch, 3 (21, 9), E Wood Pewee, 2; Black-capped Chickadee, 2, Am. Robin, 2; Black-billed Cuckoo, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1,

Blue Jay, 1, Nashville Warbler, 1, Blackburnian Warbler, 1, Scarlet Tanager, 1, Rose-breasted Grosbeak, 1; Broad-winged Hawk, +, Ruffed Grouse, +; Am. Woodcock, +; Ruby-throated Hummingbird, +; Downy Woodpecker, +; Solitary Vireo, +; Black-and-white Warbler, +; Yellow-rumped Warbler, +; Canada Warbler, +; Am. Redstart, +; Brown-headed Cowbird, +; Purple Finch, +; Chipping Sparrow, +; White-throated Sparrow, +. **Total:** 32 species; 64 territorial males (457/km², 185/100 acres). — DONALD RAKSTAD and JOHN R. PROBST, *North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.*

29. RIVER BOTTOM FOREST. — **Location:** Manitoba; Headingley, 3 mi SW of village and 800 m N of Hwy. 241 (4 mi W of jcts. of Hwys 241 and 334); 49°52'N, 97°30'W, Winnipeg 62 H/14. **Continuity:** New. **Size:** 14 ha = 34.6 acres (200 m N-S by 700 m E-W, 50 m grid laid out with compass and measured rope). **Description of Plot:** The dominant canopy trees are Green Ash (*Fraxinus pennsylvanica*), Box-elder (*Acer negundo*), White Elm (*Ulmus americana*) and Basswood (*Tilia americana*). Most prominent in the understory are Beaked Hazelnut (*Corylus cornuta*), Green Ash, and Red Osier (*Cornus stolonifera*). The ground cover consists primarily of Ostrich Fern (*Matteuccia struthiopteris*), Poison Ivy (*Rhus radicans*), Riverbank Grape (*Vitis riparia*) and Moonseed (*Menispermum canadense*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 14 square plots, 281/acre; total basal area 238.7 ft²/acre. Species comprising 90% of the total number of trees: Green Ash, 146, 55, 18, 93; Box-elder, 29, 11, 7, 93; White Elm, 30, 11, 21, 78; Basswood, 45, 17, 38, 57; Bur Oak (*Q. macrocarpa*), 14, 5, 10, 64; Cottonwood (*Populus deltoides*), 1, 1, 6, 7. Trees by diameter size class: A (3-6 in.) 155, 58, 15.1, 9; B (6-9 in.) 46, 17, 14, 8; C (9-12 in.) 26, 10, 21.1, 12; and (12-15 in.) 24, 9, 42.4, 25; D (15-21 in.) 14, 5, 42.1, 25; E (21-27 in.) 5, 2, 24.5, 14; F (27-33 in.) 1, 0.2, 5.1, 3; G (>33 in.) 1, 0.2, 6.3, 4. Shrub stems/acre 165; ground cover 85%; canopy cover 90%; average canopy height 63 ft (range 40-96). **Edge:** Located in a 40 ha wooded peninsula of the Assiniboine River. At several locations the N and S boundaries come within 100 m of the river banks. Uniform habitat exists throughout the peninsula with the exceptions of the river banks. Here *Salix* growth is dominant. **Topography:** Essentially flat but with some small ridges less than 4 ft in height parallel to the river banks. **Elevation:** Approximately 770 ft. **Weather 1977:** Generally cloudy with occasional rain but not above normal. **Coverage:** June 2, 4-6, 9, 12, 14, 16, 18-19; 0500-1300 hrs, CDT. Total man-hours: 24. **Census 1977:** Least Flycatcher, 19 (136, 55); N. Oriole, 13 (93, 38); Am. Robin, 7 (50, 20); Rose-breasted Grosbeak, 6.5 (46, 19); Great Crested Flycatcher, 3.5 (25, 10); E. Wood Pewee, 3.5; Red-eyed Vireo, 3.5; Warbling Vireo, 3.5; Yellow-throated Vireo, 2; Black-capped Chickadee, 1; Veery, 1; Philadelphia Vireo, 1; Broad-winged Hawk, +; Mourning Dove, +; Black-billed Cuckoo, +; Hairy Woodpecker, +, Downy Woodpecker, +; Blue Jay, +; White-breasted Nuthatch, +; Yellow Warbler, +, Brown-headed Cowbird, +. **Total:** 21 spe-

cies, 64.5 territorial males or females (461/km², 186/100 acres). **Weather 1978:** Clear and calm conditions prevailed throughout 5 of censuses although damp and cool with temperatures of 0 to 6°C. Cloudy with some light rain shower activities on 4 censuses. Generally a wet month with frost on two occasions. **Coverage:** June 3-4, 7, 9, 11-12, 17-18, 21. Total man-hours: 24. **Census 1978:** Least Flycatcher, 12 (86, 35); N. Oriole, 11 (79, 32); Rose-breasted Grosbeak, 5.5 (39, 16); Am. Robin, 4 (29, 12); Great Crested Flycatcher, 2; Red-eyed Vireo, 2; Warbling Vireo, 2; E. Wood Pewee, 1; House Wren, 1; Veery, 1; Philadelphia Vireo, 1; Scarlet Tanager, 1; Mourning Dove, +; Black-billed Cuckoo, +; Hairy Woodpecker, +; Blue Jay, +; Black-capped Chickadee, +; White-breasted Nuthatch, +; Yellow Warbler, +; Brown-headed Cowbird, +. **Total:** 20 species; 43.5 territorial males or females (311/km², 126/100 acres). **Remarks:** Nests found in 1977: Black-billed Cuckoo, 1; Am. Robin, 2. Young of Hairy Woodpeckers, Blue Jays, Black-capped Chickadees and White-breasted Nuthatches were also seen. No nests were found in 1978 but, again, young Hairy Woodpeckers, Blue Jays and Black-capped Chickadees were seen. W. H. KOONZ, *Dept. of Renewable Resources and Transportation Services, 1495 St. James Street, Winnipeg, Canada R3H 0W9.*

30. UPLAND MAPLE-OAK FOREST. — **Location:** Wisconsin; Waukesha Co., Falk Woods Nature Conservancy Area, 3 mi S of Waukesha, 2.5 mi S of intersection of County Highways A and F; 42°56'N, 88°14'W, Muskego Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 5.4 ha = 13.3 acres. **Description of Plot:** See AB 32:66 (1978). **Weather:** Normal temperatures; above average rainfall. **Coverage:** May 29; June 6, 9, 11, 20, 22; July 4, 6; 0530-1030. Total man-hours: 14. **Census:** Downy Woodpecker, 2; Great Crested Flycatcher, 2; Gray Catbird, 2; Red-eyed Vireo, 2; Scarlet Tanager, 2; E. Wood Pewee, 1.5; Com. Flicker, 1; Blue Jay, 1; Brown Thrasher, 1; Am. Robin, 1; Wood Thrush, 1; Blue-winged Warbler, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Indigo Bunting, 0.5; Com. Crow, +. **Total:** 16 species; 20 territorial males (372/km², 150/100 acres). **Visitors:** Red-tailed Hawk, Yellow-billed Cuckoo, Red-headed Woodpecker, Tree Swallow, Black-capped Chickadee, Starling, Brown-headed Cowbird. **Remarks:** Fledglings noted: Com. Flicker. — BOB ADAMS, JOHN BIELEFELDT, DON HAGAR, HARRY LEEMAN, VERN AUNE (compiler), *Benjamin F. Goss Bird Club, S.13 W.22167 Ridge Road, Waukesha, Wis. 53186.*

31. ASPEN FOREST (20-YEAR). — **Location:** Michigan; Ontonagon Co., SW-¼, Sec. 11, T49N, R39W. **Continuity:** New. **Size:** 5.1 ha = 12.6 acres. **Description of Plot:** Aspens (*Populus tremuloides* and *P. grandidentata*) are the dominant tree species (20-25 ft in height), with scattered Black Spruce (*Picea mariana*) and a few Red Pine (*Pinus resinosa*) present. Understory species include Beaked Hazel (*Corylus cornuta*) and cherry (*Prunus* spp.). The ground cover consisted mainly of Bracken (*Pteridium aquilinum*), Wild Straw-

berry (*Fragaria virginiana*) and *Rubus* spp. **Edge:** Bordered on all sides by similar but more mature vegetation. NW corner is lower and moist with sedge (*Cyperaceae*) and shrub vegetation (*Alnus* spp.). **Topography:** Rolling. **Coverage:** June 1-2, 5, 7, 9, 11, 23, 27; July 1, 0530-1100 hrs. Total man-hours: 22. **Census:** Ovenbird, 6 (118, 48); Rose-breasted Grosbeak, 3.5 (69, 28); Ruffed Grouse, 3 (59, 24), Nashville Warbler, 2.5; Great Crested Flycatcher, 2; Brown-headed Cowbird, 2; Hairy Woodpecker, 1.5; Veery, 1.5; Cedar Waxwing, 1.5; Blue Jay, 1; Black-and-white Warbler, 1; Tennessee Warbler, 1; White-throated Sparrow, 1; Black-capped Chickadee, 0.5; Chestnut-sided Warbler, 0.5; Least Flycatcher, +; Red-breasted Nuthatch, +, Am. Robin, +; Red-eyed Vireo, +; Black-throated Green Warbler, +; Canada Warbler, +; Purple Finch, +. **Total:** 22 species; 28.5 territorial males (559/km², 226/100 acres). — CONNIE J. PEARSON and JOHN R. PROBST, *North Central Forest Experiment Station, U.S. Forest Service, St. Paul, Minn. 55108.*

32. ASPEN FOREST (50-YEAR). — **Location:** Michigan; Ontonagon Co., NE-¼, Sec. 18, T49N, R39W. **Continuity:** New. **Size:** 9.0 ha = 22.24 acres. **Description of Plot:** Red Maple (*Acer rubrum*) and Aspen (*Populus tremuloides* and *grandidentata*) are the dominant canopy trees. Basswood (*Tilia americana*), Hop Hornbeam (*Ostrya virginiana*), Green Ash (*Fraxinus pennsylvanica*) and some scattered White Spruce (*Picea glauca*) and Balsam Fir (*Abies balsamea*) are also present. Chief understory species are Hazel (*Corylus cornuta*) and saplings of Red Maple, Hop Hornbeam, and Basswood. **Edge:** The E is bordered by a road (USFS 457); all other sides by similar cover. **Topography:** Essentially flat. **Coverage:** May 30; June 3, 6, 8-9, 21, 25, 29, between 0530-1130 hours. Total man-hours 18.25. **Census:** Ovenbird, 14 (156, 63); Red-eyed Vireo, 6 (67, 27); Great Crested Flycatcher, 3 (33, 13); Brown-headed Cowbird, 3, Least Flycatcher, 2.5; Hairy Woodpecker, 1, Black-capped Chickadee, 1; Hermit Thrush, 1; Veery, 1; Black-throated Green Warbler, 1, Rose-breasted Grosbeak, 1; Ruffed Grouse, 0.5; Black-and-white Warbler, 0.5; Canada Warbler, 0.5; Black-billed Cuckoo, +; Com. Flicker, +; Blue Jay, +; Com. Raven, +; Cedar Waxwing, +; Blackburnian Warbler, +, Mourning Warbler, +; Red-winged Blackbird, +; Scarlet Tanager, +; Indigo Bunting, +; Purple Finch, +; Chipping Sparrow, +, Song Sparrow, +. **Total:** 27 species; 36 territorial males (400/km², 162/100 acres). — CONNIE J. PEARSON and JOHN R. PROBST, *North Central Forest Experiment Station, U.S. Forest Service, 1992 Folwell Ave., St. Paul, Minn. 55108.*

33. 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; 5 consecutive years. **Size:** 9.3 ha = 23 acres. **Description of Plot:** See AB 28:1005-1006 (1974). **Weather:** Temperatures 26°-66°F, overcast on 3 trips, otherwise clear. Max. wind 9 mph; 26°F on May 2 was the coldest in 106 years and 47°F on July 11 was also a record low. **Coverage:** Apr. 28; May 1-2; June 16, 19,

21, 23, July 11-12, between 0550 and 0930, EDT Total man-hours 165 **Census:** Starling, 9.5 (102, 41); Cardinal, 7 (75, 30); Com. Flicker, 6 (64, 26); Downy Woodpecker, 6; Ring-necked Pheasant, 4 (43, 17); Blue Jay, 4; Am. Robin, 4; Com. Crow, 3 (32, 13); Red-headed Woodpecker, 2; Great Crested Flycatcher, 2; Red-eyed Vireo, 2; Red-winged Blackbird, 2; Com. Grackle, 2; Song Sparrow, 2, Canada Goose, 1; Mallard, 1; Am. Kestrel, 1, Hairy Woodpecker, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; House Sparrow, 1; Am. Goldfinch, 1; Killdeer, +; Spotted Sandpiper, +. **Total:** 25 species; 64.5 territorial males (693/km², 280/100 acres). **Remarks:** Again a definite decline in number of territorial males and nesting species, probably a result of another severe winter followed by a very cold spring. There has also been a gradual but constant increase in human activity in and around the area since 1974. A few Starlings may have been missed because of a lack of coverage mid-April, however two flocks of 60 and 85 were seen in June. Additional buildings being erected ¼ mile SW of the area seem to have attracted House Sparrows resulting in the only new nesting species this year — perhaps they were taking advantage of a lack of native species. Young seen included Canada Goose, Mallard, Ring-necked Pheasant, Com. Flicker, Red-headed Woodpecker, Downy Woodpecker, Am. Robin, Starling and Cardinal. Thanks to Ellie Cox for assistance with this census and to Southfield Civic Center for their continuing support. — **BETTY CHALLIS, Oakland Audubon Society, 2335 Pontiac Lk. Rd., Pontiac, Mich. 48054.**

34. OAK - HICKORY - MAPLE FOREST.

— **Location:** Illinois; McLean Co., Moraine View State Park, 3 mi S Ellsworth; T22N, R4E, SE ¼, Sec. 34, Arrowsmith Q, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 13 ha = 32 acres. **Description of Plot:** See AB 31:43 (1977). **Coverage:** June 14, 23, 25; July 3-4, 10-12; 0600-0900 hours. Total man-hours: 18. **Census:** Great Crested Flycatcher, 3 (23, 9); House Wren, 3; Am. Robin, 3; Wood Thrush, 3; Red-eyed Vireo, 3; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Scarlet Tanager, 2; Indigo Bunting, 2, Red-headed Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Ovenbird, 1; Kentucky Warbler, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Whip-poor-will, +, Com. Flicker, +; Com. Crow, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 25 species; 36 territorial males (278/km², 113/100 acres). **Remarks:** The nesting population was similar to that of 1976 and 1977 except that woodcock and Acadian Flycatcher were not recorded. — **DALE E. BIRKENHOLZ, Illinois State Univ., Normal, Ill. 61761.**

35. BLACK OAK-SASSAFRAS WOODS.

— **Location:** Indiana; Porter Co., 1.5 mi E intersection of Rts 49 and 12, within Indiana Dunes National Lakeshore. Area bisected by country road and bridle path; 41°39'N, 87°02'W, Dune Acres Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 22.22 ha = 54.9 acres. **Description of**

Plot: Wooded dune and sand prairie area burned in 1971 Dense suckers and downed trees make some areas impenetrable. See AB 28:1007 (1974). **Weather:** Late wet spring after record snows. Mosquitoes abundant. **Coverage:** April 8-July 16; 23 early morning trips. Total man-hours: 65. **Census:** Rufous-sided Towhee, 10 (45, 18); Field Sparrow, 10; Brown Thrasher, 6 (27, 11); Gray Catbird, 5 (23, 9); Com. Yellowthroat, 3 (14, 5); Cardinal, 2; Indigo Bunting, 2; Blue-winged Teal, 1; Tufted Titmouse, 1; Cedar Waxwing, 1; Golden-winged Warbler, 1; Rose-breasted Grosbeak, 1. **Total:** 12 species; 43 territories (194/km², 78/100 acres). **Remarks:** Teal nest located. Cowbirds ubiquitous again. — **EMMA B. PITCHER 1159 E 56th St., Chicago, Ill. 60637.**

36. MIXED HARDWOOD REGENERATING.

— **Location:** Ohio; Fairfield Co., Berne Township, 1 mi W of Sugar Grove and 6 mi S of Lancaster; Wahkeena Nature Preserve; 82°30'W, 39°37'30"N, NE/4 Lancaster Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 20.2 ha = 50 acres. **Description of Plot:** See AB 31:45 (1977) **Weather:** Normal. **Coverage:** May 12 - June 15; 11 trips, majority 0700-0900. Total man-hours: 31. **Census:** Red-eyed Vireo, 8 (40, 16); Acadian Flycatcher, 6 (30, 12); Ovenbird, 5 (25, 10); Scarlet Tanager, 4 (20, 8); E. Wood Pewee, 3 (15, 6); Wood Thrush, 3; Worm-eating Warbler, 3; Yellow-billed Cuckoo, 2; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Blue-gray Gnatcatcher, 2; Kentucky Warbler, 2; Cardinal, 2; Ruby-throated Hummingbird, 1; Red-bellied Woodpecker, 1; Blue Jay, 1; Com. Crow, 1; Tufted Titmouse, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; N. Parula, 1; Cerulean Warbler, 1; Hooded Warbler, 1; Am. Redstart, 1; Com. Grackle, 1; Rufous-sided Towhee, 1; Turkey Vulture, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 29 species; 57 territorial males (282/km², 114/100 acres). **Remarks:** Only 4 nests were found and of these 3 were unsuccessful: redstart, Red-eyed Vireo, and Worm-eating Warbler (with 2 cowbird eggs). For the second year, there were no Carolina Wrens, a bird that was numerous two years ago. The last two severe winters probably are responsible for the overall decline of most species. Most of our census birds are year round residents. The Wood Thrush population was also noticeably down this year. — **ANN BINGAMAN (compiler), TOM WOOD, ESTHER REICHELDERFER, JIM FRY, JEAN HOFFMAN, and JIM HOFFMAN, Ohio Historical Society, 1982 Velma Ave., Columbus, Ohio 43211.**

37. NEOTOMA VALLEY. — **Location:** Ohio; Hocking Co., Good Hope Township, NW¼, Sec. 16, T13N, R18W; approximately 39°36'N, 82°10'W, Lancaster Quadrangle, USGS. **Continuity:** New. **Size:** Approximately 20.2 ha = 50 acres, with boundaries on the S to a pasture; on the NE to a cliff; on the SW to deciduous forest, about half way up the slope (about 100 ft above the gas line); on the N to deciduous forest, about 2400 ft from the S line. **Description of Plot:** A typical, cliff-bordered, cove-headed valley, about a mile in length, heading NW. Arbutus Run flows into Clear Creek about a mile from the confluence of that stream and the Hocking River. On the

SW-facing side, 50-ft cliffs rise vertically above the talus slope and extend to a waterfall. On the NE-facing side, discontinuous cliff remnants about 30 ft in height occur and converge at the waterfall, forming a rock-rimmed cove into which Arbutus Run drops 40 ft. Below the cliffs are steep talus slopes on which are scattered sandstone boulders and rock fragments ranging in size from a few ft to 50-60 ft in diameter. The closed canopy of the SW-facing slope is dominated by Chestnut Oak (*Quercus prinus*), and in small ravines or cove-like areas at the N end, White Oak (*Q. alba*) is prominent. Secondary species, found in the typical mixed mesophytic forest, occur sparingly, especially on the lower slopes, in the reentrants, and coves. Pines of three species are scattered on the SW-facing slope, along cliff border, and on the upland area. The NE-facing slopes, cooler and more moist, support a rich mixed mesophytic assemblage in which several species are prominent: Tulip-tree (*Liriodendron tulipifera*), White Oak, Red Oak (*Q. borealis*), Mockernut Hickory (*Carya tomentosa*), Red Maple (*Acer rubrum*), Sugar Maple (*A. saccharum*), Black Walnut (*Juglans nigra*), White Ash (*Fraxinus americana*), Am. Beech (*Fagus grandifolia*), and others. The understory is sparse on the SW-facing slope, and on the upper levels Mountain Laurel (*Kalmia latifolia*) is conspicuous, while at lower levels, *Sassafras albidum* and seedling oaks occur. Exposed leaf cover and patchy areas of lichens and mosses are frequent. In sharp contrast, the understory and ground cover of the NE-facing side of the valley are rich in species and dense in growth. Blue Beech (*Carpinus caroliniana*) is dominant along with Red Maple, Maple-leaved Viburnum (*Viburnum acerifolium*), Leatherwood (*Dirca palustris*), and Spicebush (*Litsea aestivalis*). Ground cover is extensive with very few exposed leaf cover areas, abundant in species and dense in growth. It is composed of ferns, club mosses, orchids, grasses, and a host of herbaceous seasonal plants. A vegetational survey resulted in the following data: 251 stems per acre, 3 in. or greater in dbh 91 ft² basal area per acre (Figures after each species give the number of trees/acre, relative density (%), relative dominance (%), and frequency (%), in that order). Species that comprise 90% of the total number of trees: Chestnut Oak 30, 9.8, 7.8, 23.8; Tulip-tree, 30, 9.8, 20.1, 23.8; White Oak 28, 9.4, 22.4, 26.8; Black Gum (*Nyssa sylvatica*), 22, 7.4, 1.4, 20.8; Red Maple 19, 6.4, 3.4, 19.4; Flowering Dogwood (*Cornus florida*), 18, 5.9, 1.0, 13.4; Sassafras, 16, 5.4, 1.0, 13.4; Blue Beech, 16, 5.4, .9, 13.4; Scarlet Oak 13, 4.4, 5.6, 7.5; Yellow Pine (*Pinus* sp.), 12, 3.9, 4.3, 5.9; Hemlock (*Tsuga canadensis*), 8, 2.9, 6.1, 8.9; Red Oak, 9, 2.9, 4.7, 5.9; Black Oak (*Q. velutina*), 7, 2.5, 3.4, 5.9; Sweet Birch (*Betula lenta*), 7, 2.4, .7, 6.0; dead trees, 31, 10.3, 1.8, 26.8. Trees by diameter size class A (3-6 in.) 112, 44.2, 12.4, 13.6; B (6-9 in.) 65, 25.8, 14.9, 16.4; C (9-12 in.) 47.5, 18.7, 19.9, 21.9; and (12-15 in.) 23.5, 9.3, 22.8, 25.2; D (15-18 in.) 4.5, 1.7, 5.9, 6.5; and (18-21 in.) .25, .09, .5, .6; G (33-36 in.) .15, .06, 1.0, 1.1 Shrubs and seedlings per acre: 2042 (projected from counts in 670.01 acre stations; ground cover, 63%; canopy cover, 84%; mean canopy height, 90 ft (range 70-125). **Weather:** Two successive cold winters probably accounts for low densities in Carolina Wren and Cardinal.

Weather patterns were not regarded as abnormal. **Coverage:** June 3-5, Aug 14 Total 28 man-hours. **Census:** Red-eyed Vireo, 10 (49, 20), Scarlet Tanager, 8 (40, 16); Acadian Flycatcher, 6 (30, 12); Wood Thrush, 6; Red-bellied Woodpecker, 4 (20, 8); Ovenbird, 4; White-breasted Nuthatch, 3 (15, 6); Cerulean Warbler, 3; Kentucky Warbler, 3; Cardinal, 3; Yellow-billed Cuckoo, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Blue Jay, 2; Tufted Titmouse, 2; Worm-eating Warbler, 2; Ruffed Grouse, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Com. Crow, 1; Carolina Chickadee, 1; Gray Catbird, 2; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Blue-winged Warbler, 1; Louisiana Waterthrush, 1; Com. Yellowthroat, 1; Hooded Warbler, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1; Song Sparrow, 1. **Total:** 37 species; 84 territorial males/females (415/100ha/168/100 acres). **Remarks:** Certainly contributing to the low density were: (1) field-hours less than desirable, despite three intensive periods when more than 30 observers were present; (2) two successive cold winters with deep snow, (3) characteristics of the *Neotoma* environment. — A. H. CLAUGUS (compiler), 228 S. Lake St., Carey, Ohio 43316.



BREEDING BIRD POPULATIONS OF SELECTED OAK-HICKORY FORESTS IN NORTHEASTERN KANSAS

The following six censuses were conducted in 20-acre stands of oak-hickory forest in an area known locally as "Baldwin Woods." This forest cloaks the dissected escarpment along the S side of the Wakarusa River Valley, centering on the Coal Creek watershed in southern Douglas County. It was formerly one of the more beautiful forests in NE Kansas and even after many of the large oaks and walnuts were harvested much of its original character persisted. The forest is unusually rich in species of trees considering its location (on the W edge of the oak-hickory forest in the United States) and, the frequently simple composition of oak-hickory forests. Some of the forest is being lost to land development but other areas are now being preserved as biological study reserves by the University of Kansas and as state park land by the Kansas Forestry, Fish and Game Commission.

Weather data are available from a climatological station at the University of Kansas at Lawrence, 12 mi NW of the study areas. Temperatures were slightly above the norm with a mean low of 64°F and a mean high of 86°F in June. Precipitation was below normal; about 3.5 inches fell in June (monthly norm 6 in.).

Our thanks to the Field Research Committee, Division of Biological Sciences, at the University of Kansas for use of research areas under their control and to Frank Sturdy and Mr. and Mrs. Thomas Beisecker for access to their properties. — CALVIN L. CINK and ROGER L. BOYD, *Biol. Dept., Baker Univ., Baldwin City, KS 66006.*

38. OAK-HICKORY FOREST, I. — Location: Kansas, Douglas Co., on the Univ of Kansas Wall Biological Reserve. Predominantly on the NW 1/4, SW 1/4, Section 28, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres, surveyed). **Description of Plot:** Dominant canopy trees are White Oak (*Quercus alba*), Red and Black Oak (*Q. borealis* and *Q. velutina*), and Chinquapin Oak (*Q. muhlenbergii*). Most prominent in the understory are young Slippery Elm (*Ulmus fulva*), Red Mulberry (*Morus rubra*), Rough-leaved Dogwood (*Cornus asperifolia*), and Green and White Ash (*Fraxinus americana* and *pennsylvanica*). Herbaceous ground cover is primarily Tick Trefoil (*Desmodium glutinosum*), Virginia Creeper (*Parthenocissus vitacea*), and various grasses. A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over, based on five 0.1-acre circular samples, 322/acre; total basal area 102 ft²/acre. Live tree species counted: White Oak, 128, 40, 41, 80; Red and Black Oak, 70, 22, 20, 100; Chinquapin Oak, 50, 16, 23, 20; Green and White Ash, 32, 10, 7, 80; Shagbark Hickory (*Carya ovata*), 16, 5, 2, 80; Redbud (*Cercis canadensis*), 6, 2, 3, 40; Black Walnut (*Juglans nigra*), 6, 2, 3, 20; Post Oak (*Q. stellata*), 4, 2, 2, 20; Wild Cherry (*Prunus serotina*), 2, 1, 0.4, 20; Kentucky Coffee-tree (*Gymnocladus dioica*), 2, 1, 0.2, 20; Red Mulberry, 2, 1, 0.2, 20; Hackberry (*Celtis occidentalis*), 2, 1, 0.2, 20; Linden (*Tilia glabra*), 2, 1, 0.2, 20. Trees by diameter size class: A (3-6 in.) 132, 41, 13.2, 13; B (6-9 in.) 78, 24, 23.6, 23; C (9-15 in.) 92, 29, 32.2, 32; D (15-21 in.) 18, 6, 27.4, 27; E (21-27 in.) 2, 1, 5.6, 5. Shrub stems/acre, 2,480; ground cover 74%; canopy cover 96%; average canopy height 47 ft (range 42-54). **Edge:** Bordered on all sides by similar forest. **Topography:** N facing slope broken by several deep N-S ravines. Elevation about 1030-1100 ft. **Coverage:** June 10-11, 13, 16, 18, 25; 0800-1200 and 1600-1800. Total man-hours: 15. **Census:** Blue Jay, 5 (62, 25); Tufted Titmouse, 5; Black-capped Chickadee, 4 (49, 20); Kentucky Warbler, 4; Downy Woodpecker, 3 (37, 15); Great Crested Flycatcher, 3; White-breasted Nuthatch, 3; Red-eyed Vireo, 3; Rose-breasted Grosbeak, 3; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Wood Thrush, 2; Summer Tanager, 2; Mourning Dove, 1; Com. Flicker, 1; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Louisiana Waterthrush, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Cardinal, 1; N. Parula, +. **Total:** 23 species; 51 territorial males (630/km², 255/100 acres). **Visitors:** Am. Woodcock, Chimney Swift, Com. Crow, N. Oriole, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Red-headed Woodpecker, Blue Jay, and Wood Thrush.

39. OAK - HICKORY FOREST, II. — Location: Kansas; Douglas Co., on the Univ. of Kansas Breidenthal Biological Reserve (Cliff Woods). Predominantly on the NE 1/4, NW 1/4, Section 28, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres surveyed). **Description of Plot:** Dominant canopy trees are Chinquapin Oak, Post Oak, White and Green Ash, and Shagbark Hickory. Most prominent in the understory are Rough-leaved

Dogwood, Redbud, young Slippery Elm, and Shagbark Hickory. Herbaceous ground cover is primarily Tick Trefoil, Poison Ivy (*Toxicodendron radicans*), Elm-leaf Goldenrod (*Solidago ulmifolia*), Virginia Creeper, and various grasses. A quantitative survey of the vegetation gave the following results: Trees, 3 in diameter and over, based on five 0.1-acre circular samples, 444/acre; total basal area 141.4 ft²/acre. Live tree species counted: Chinquapin Oak, 136, 31, 32, 100; Post Oak, 94, 21, 32, 80; White and Green Ash, 82, 18, 13, 100; Shagbark Hickory, 60, 14, 8, 100; Red and Black Oak, 34, 18, 13, 100; Black Walnut, 14, 3, 5, 80; Redbud, 18, 4, 2, 40; Slippery Elm, 4, 1, 0.4, 20; Bitternut Hickory (*C. cordiformis*), 2, 0.5, 0.7, 20. Trees by diameter size class: A (3-6 in.) 178, 40, 21, 6, 15; B (6-9 in.) 174, 39, 53.6, 38; C (9-15 in.) 90, 20, 63.1, 45; D (15-21 in.) 2, 0.5, 3.1, 2. Shrub stems/acre, 2760; ground cover 67%; canopy cover 97%; average canopy height 42 ft (range 36-48). **Edge:** Bordered by similar forest on all sides except for a small clearing on the NE corner. **Topography:** A fairly steep S facing slope; elevation about 1000-1130 ft. **Coverage:** June 4, 6, 9-11, 24; 0700-1130 and 1630-1800. Total man-hours: 14. **Census:** Blue Jay, 4 (49, 20); Tufted Titmouse, 3 (37, 15); White-breasted Nuthatch, 3; Yellow-billed Cuckoo, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Kentucky Warbler, 2; Cardinal, 2; Screech Owl, 1; Whip-poor-will, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; E. Wood Pewee, 1; Brown Thrasher, 1; Red-eyed Vireo, 1; Indigo Bunting, 1; Barred Owl, +. **Total:** 18 species; 30 territorial males (371/km², 150/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Chimney Swift, E. Phoebe, Com. Crow, Gray Catbird, Black-and-white Warbler, Ovenbird, Com. Grackle. **Remarks:** Single nests found: Whip-poor-will, Downy Woodpecker, Indigo Bunting.

40. OAK - HICKORY FOREST, III. — Location: Kansas; Douglas Co., on the Univ of Kansas Breidenthal Biological Reserve. Predominantly on the NE 1/4, NE 1/4, Section 28, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres, surveyed). **Description of Plot:** Dominant canopy is White Oak with a lesser number of ash (*Fraxinus* spp.) and other mixed hardwoods. Most prominent in the understory are young Slippery Elms, Redbud, Ironwood (*Carpinus caroliniana*), and Shagbark Hickory. Herbaceous ground cover is primarily mixed grasses with lesser amounts of Tick-Trefoil, Virginia Creeper, and various other species of composites. A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over, based on five 0.1-acre circular samples, 344/acre, total basal area 130 ft²/acre. Live tree species counted: White Oak, 176, 51, 48, 100; White and Green Ash, 46, 13, 6, 60; Red and Black Oak, 28, 8, 18, 80; Shagbark Hickory, 24, 7, 5, 80; Bitternut Hickory, 18, 5, 3, 60; Black Walnut, 16, 5, 2, 60; Slippery Elm, 14, 4, 1, 60; Chinquapin Oak, 8, 2, 3, 40; Redbud, 4, 1, 0.5, 20; Red Mulberry, 2, 0.6, 0.5, 20; Hackberry (*Celtis occidentalis*), 2, 0.6, 2, 20; Ironwood, 2, 0.6, 0.2, 20; Sycamore (*Platanus occidentalis*), 2, 0.6, 3, 20. Trees by diameter size class: A (3-6 in.) 112, 33, 13.2, 10; B (6-9 in.) 140, 41, 43.8, 34; C (9-15 in.) 78, 23, 46.4, 36,

D (15-21 in.) 10, 3, 15.8, 12, E (21-27 in.) 4, 1, 10.8, 8 Shrub stems/acre, 3,720, ground cover 78%; canopy cover 93%; average canopy height 52 ft (range 36-78). **Edge:** Bordered on all sides by similar forest except for a small pond on the NE corner and a small clearing on the S side. **Topography:** A N facing slope; elevation about 1000-1100 ft. A creek flows through the NW corner. **Coverage:** May 30; June 2-3, 6, 9, 13; 0730-1100 and 1630-1800. Total man-hours: 12. **Census:** Yellow-billed Cuckoo, 4 (49, 20); Great Crested Flycatcher, 4, Wood Thrush, 4; Cardinal, 4; Blue Jay, 3 (37, 15); Scarlet Tanager, 2.5; Mourning Dove, 2; E. Wood Pewee, 2; Tufted Titmouse, 2, Brown Thrasher, 2; Red-eyed Vireo, 2; Louisiana Waterthrush, 2; Kentucky Warbler, 2; Chuck-will's-widow, 1; Com. Flicker, 1, Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Willow Flycatcher, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Carolina Wren, 1, Am. Robin, 1; Rose-breasted Grosbeak, 1; Green Heron, +; Gray Catbird, +; Blue-gray Gnatcatcher, +; N. Parula, +; Summer Tanager, +. **Total:** 29 species; 46.5 territorial males (575/km², 233/100 acres). **Visitors:** Red-tailed Hawk, Am. Woodcock, Ruby-throated Hummingbird, Com. Crow. **Remarks:** Single nests of the following were found: Yellow-billed Cuckoo, Chuck-will's-widow, Wood Thrush, Scarlet Tanager.

41. OAK - HICKORY FOREST, IV. —

Location: Kansas; Douglas Co., Sturdy's Woods. Predominantly on the NE 1/4, NE 1/4, Section 27, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres, surveyed). **Description of Plot:** Dominant canopy trees are Post Oak, Red and Black Oak, and Shagbark Hickory. Most prominent in the understory are young Shagbark Hickory, Slippery Elm, Redbud, and Ironwood. Herbaceous ground cover is primarily Tick-Trefoil, and various grasses and composites. A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over, based on five 0.1-acre circular samples, 534/acre; total basal area 112.3 ft²/acre. Live tree species counted: Post Oak, 164, 31, 26, 80; Red and Black Oak, 114, 21, 35, 100; Shagbark Hickory, 112, 21, 14, 80; Chinquapin Oak, 52, 10, 12, 40; White and Green Ash, 50, 9, 7, 100; Red Mulberry, 16, 3, 2, 20; Bitternut Hickory, 10, 2, 2, 20; Ohio Buckeye (*Aesculus glabra*), 8, 2, 1, 20; Slippery Elm, 6, 1, 1, 60; Mossy-cup Oak (*Q. macrocarpa*), 2, 0.5, 1, 20. Trees by diameter size class: A (3-6 in.) 312, 58, 37.8, 34; B (6-9 in.) 186, 35, 54, 48; C (9-15 in.) 36, 7, 20.4, 18. Shrub stems/acre, 1,600; ground cover 73%; canopy cover 81%; average canopy height 39 ft (range 29-47). **Edge:** Bordered on all sides by similar forest. **Topography:** A N facing slope; elevation about 900-1130 ft. **Coverage:** June 13, 16-18, 20; 0700-1030 and 1630 to 1830. Total man-hours: 12. **Census:** Tufted Titmouse, 4 (49, 20); Blue Jay, 3 (37, 15); Black-capped Chickadee, 3; Great Crested Flycatcher, 2; E. Wood Pewee, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2, Yellow-billed Cuckoo, 1.5; Mourning Dove, 1, Great Horned Owl, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Wood Thrush, 1; Summer Tanager, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Red-headed Woodpecker, +; Kentucky Warbler, +;

Brown-headed Cowbird, + **Total:** 19 species, 27.5 territorial males (340/km², 138/100 acres). **Visitors:** Com. Flicker, Hairy Woodpecker, Com. Crow, Com. Grackle.

42. OAK - HICKORY FOREST, V. —

Location: Kansas; Douglas Co., East Beisecker Woods. Predominantly on the NE 1/4, NE 1/4, Section 35, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres, surveyed). **Description of Plot:** Dominant canopy trees are Shagbark Hickory, White and Green Ash, and Post Oak. Most prominent in the understory are young Slippery Elm, Rough-leaved Dogwood, and Red and Black Oak. Herbaceous ground cover is primarily Virginia Creeper, Tick-Trefoil, and various grasses. A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over, based on five 0.1-acre circular samples, 268/acre; total basal area 98.3 ft²/acre. Live tree species counted: Shagbark Hickory, 96, 36, 27, 80; White and Green Ash, 36, 13, 25, 60; Post Oak, 24, 9, 7, 20; Black Walnut, 22, 8, 15, 40; Red and Black Oak, 20, 8, 10, 80; White Oak, 12, 5, 5, 20; Slippery Elm, 12, 5, 2, 60; Redbud, 10, 4, 1, 20; Mossy-cup Oak, 8, 3, 4, 60; Chinquapin Oak, 6, 2, 2, 40; Bitternut Hickory, 6, 2, 1, 20; Red Mulberry, 6, 2, 0, 4, 40; E. Red Cedar (*Juniperus virginiana*), 6, 2, 0.3, 20; Hackberry, 2, 1, 0.2, 20; Wild Cherry, 2, 1, 1, 20. Trees by diameter size class: A (3-6 in.) 98, 37, 10.7, 11; B (6-9 in.) 90, 34, 27.1, 28; C (9-15 in.) 70, 26, 43.5, 44; D (15-21 in.) 10, 4, 17.1, 17. Shrub stems/acre, 1,380; ground cover 80% canopy cover 86%; average canopy height 47 ft (range 39-58). **Edge:** Bordered on all sides by similar forest. **Topography:** An E facing slope; elevation about 950-1040 ft. **Coverage:** June 24, 27, 30; July 1-2; from 0600-1100 and 1600-1930. Total man-hours: 11. **Census:** Blue Jay, 4 (49, 20) Downy Woodpecker, 3 (37, 15); Tufted Titmouse, 3; White-breasted Nuthatch, 3; Kentucky Warbler, 3; E. Wood Pewee, 2; Black-capped Chickadee, 2; Wood Thrush, 2; Red-eyed Vireo, 2; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Whip-poor-will, 1; Com. Flicker, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Scarlet Tanager, 1; Summer Tanager, 1; Cardinal, 1; Barred Owl, +; Chuck-will's-widow, +; Hairy Woodpecker, +; Blue-gray Gnatcatcher, +; Brown-headed Cowbird, +. **Total:** 25 species; 35 territorial males (432/km², 175/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Rough-winged Swallow, Carolina Wren, Gray Catbird, Warbling Vireo, N. Oriole, Indigo Bunting, Am. Goldfinch.

43. OAK - HICKORY FOREST, VI. —

Location: Kansas; Douglas Co., West Beisecker Woods. Predominantly on the SW 1/4, NE 1/4, Section 35, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (4 × 5 acres, surveyed). **Description of Plot:** Dominant canopy trees are Post Oak, Shagbark Hickory, and Black Jack Oak (*Q. marilandica*). Most prominent in the understory are White and Green Ash saplings, Slippery Elm saplings (*Ulmus fulva*), and Rough-leaved Dogwood. Herbaceous ground cover is partially various grasses, Elm-leaf Goldenrod, and Virginia Creeper. A quantitative survey of the vegetation gave the

following results: Trees, 3 in diameter and over, based on five 0.1-acre circular samples, 376/acre; total basal area 107.3 ft²/acre. Tree species counted: Post Oak, 186, 50, 48, 80, Shagbark Hickory, 92, 25, 22, 100; Black Jack Oak, 34, 9, 10, 80; Mossy-cup Oak, 18, 5, 8, 40; White and Green Ash, 12, 3, 3, 40; Chinquapin Oak, 8, 2, 2, 20; Red and Black Oak, 8, 2, 3, 80; Slippery Elm, 6, 2, 1, 20; Black Walnut, 4, 1, 1, 20; Wild Cherry, 2, 0.5, 0.3, 20; Ohio Buckeye, 2, 0.5, 0.1, 20; Red Mulberry, 2, 0.5, 0.3, 20. Trees by diameter size class: A (3-6 in.) 118, 32, 14.5, 14; B (6-9 in.) 198, 53, 58.7, 55; C (9-15 in.) 60, 16, 34.1, 32. Shrub stems/acre, 1920; ground cover 66%, canopy cover 86%; average canopy height 42 ft (range 35-50). **Edge:** Bordered by similar forest on all sides. **Topography:** A W facing slope; elevation about 1000-1050 ft. **Coverage:** June 17, 23-25, 30; July 1; 0630-1030 and 1530-1900. Total man-hours: 10. **Census:** Great Crested Flycatcher, 3 (37, 15); Blue Jay, 3; Tufted Titmouse, 3; Mourning Dove, 2, Black-capped Chickadee, 2; Wood Thrush, 2, Red-eyed Vireo, 2; Yellow-billed Cuckoo, 1, Great Horned Owl, 1; Whip-poor-will, 1, Downy Woodpecker, 1; E. Wood Pewee, 1, Brown-headed Cowbird, 1; Summer Tanager, 1; Red-bellied Woodpecker, +; White-breasted Nuthatch, +; Kentucky Warbler, +, Cardinal, +. **Total:** 18 species; 24 territorial males (297/km², 120/100 acres). **Visitors:** Red-tailed Hawk, Com. Flicker, Com. Crow, Brown Thrasher, Am. Robin, Warbling Vireo, N. Oriole, Com. Grackle, Am. Goldfinch.

44. BOTTOMLAND HARDWOOD FOREST. —

Location: Texas; Ft. Bend Co., Hale Ranch State Park, 4 mi ESE of intersection of Fm. 762 and Sawmill Road; NW corner 29° 23' 10" N, 95° 35' W, Thompsons Quadrangle, USGS. **Continuity:** New. **Size:** 6.48 ha = 16 acres (square, surveyed with steel tape and compass). **Description of Plot:** The dominant canopy trees are Cedar Elm (*Ulmus crassifolia*), Green Ash (*Fraxinus pennsylvanica*), and Sugar Hackberry (*Celtis laevigata*). Prominent in the understory are hawthorn (*Crataegus* sp.), Deciduous Holly (*Ilex decidua*) and W Soapberry (*Sapindus drummondii*), and an extensive liana growth, the prominent species being Poison Ivy (*Toxicodendron radicans*), Com. Trumpet-Creeper (*Bignonia radicans*) and Virginia Creeper (*Parthenocissus quinquefolia*). Spanish Moss (*Tillandsia usneoides*) is prominent. The ground cover is primarily Virginia Wildrye (*Elymus virginicus*), sedge (*Carex* sp.), Mist Flower (*Eupatorium coelestinum*) and Coralberry (*Symphoricarpos orbiculatus*). A quantitative survey of the vegetation gave the following results: Trees 3 in diameter and over, based on six circular samples; 252.8/acre; total basal area 158.6 ft²/acre. Species comprising 92.8% of the total number of trees (figures give number of trees/acre, relative density in percent, relative dominance and frequency, in that sequence) Green Ash, 68.8, 27.2, 24.1, 83.3; Cedar Elm, 54.4, 21.5, 34.7, 100; Sugar Hackberry, 41.6, 16.4, 28.6, 38.3; Pecan (*Carya illinoensis*), 36.8, 14.5, 4.3, 83.3; Hawthorn, 19.2, 7.5, 4.6, 83.3; Woollybucket Bumelia (*Bumelia lanuginosa*), 16, 6.3, 2.5, 66.6. Trees by diameter size class (figures give number of trees/acre, relative density in percent, basal area in ft²/acre, relative dominance): A (3-6 in.) 81.6, 32.3, 11.4, 7.2; B (6-9 in.) 43.2, 17, 13, 8.2; C (9-15

m) 102 4, 40 5, 81 9, 51 6, D (15-21 in) 20 8, 8 3, 37 4, 23 6, E (21-27 in) 4 8, 1 9, 14 9, 9 4
 Shrub stems/acre 3,700; ground cover 93%; canopy cover 79%; average canopy height 60 ft (range 56-66). **Edge:** Bordered on the N by 500 ft of similar forest, followed by Cottonwood Bayou, Sawmill Road and extensive pasturage, on the E by similar forest, on the S and W by a grass-covered road (approximately 25 ft in width), followed by similar forest. A small creek, dry during the count period, crosses the NW corner. **Topography:** Essentially flat. **Elevation:** 49 ft. **Weather:** Extremely hot and dry throughout period, near-drought conditions prevailing through third week of May; 65-85°. **Coverage:** Apr. 8, 29; May 13, 27, 29; June 4, 10, 24; 0630-0930 hours. Total man-hours: 15. **Census:** Cardinal, 8 (124, 50); White-eyed Vireo, 7 (107, 44); Tufted Titmouse, 4 (62, 25); Carolina Wren, 4; N. Parula, 4; Yellow-billed Cuckoo, 3 (46, 19); Acadian Flycatcher, 3; Carolina Chickadee, 3; Summer Tanager, 2; Painted Bunting, 2; Red-bellied Woodpecker, 1; Red-eyed Vireo, 1; Prothonotary Warbler, 1; Brown-headed Cowbird, 1 (female); Great Crested Flycatcher, 0 5; Red-shouldered Hawk, +; Downy Woodpecker, +; Com. Crow, +; Yellow-throated Vireo, +; Swainson's Warbler, +. **Total:** 20 species; 44.5 territorial males or females (687/km², 278/100 acres). **Remarks:** Part of the Hale Ranch State Park site, presently being developed by Texas Parks and Wildlife. Special thanks to Wesley Cureton and David Dauphin for assistance with measurements, and to Larry Lodwick and Debbie Dekeyzer for help with the quantitative habitat description. — **TED L. EUBANKS JR.** (compiler), **JAMES G. MORGAN**, 4012 Childress, Houston, Tex. 77005.

45. 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:** Established 1976; 3 consecutive years. **Size:** 11.8 ha = 29.2 acres. **Description of Plot:** See AB 31:50-51 (1977). **Weather:** In nearby Boston the temperature for May was 0.7°F above normal, for June 0.3°F above; rainfall in May was 1.03 in. above normal, in June 1.66 in. below. **Coverage:** Apr. 29, May 2-3, 8, 10, 13, 19, 21-22, 28; June 1, 3, 6, 9-10, 12; July 1, 5-6; 0515-1120. Total man-hours: 37. **Census:** Blue Jay, 5 (42, 17); Black-capped Chickadee, 4 (34, 14); Ovenbird, 4; Scarlet Tanager, 4; Rufous-sided Towhee, 4; Gray Catbird, 3 (25, 10); Black-and-white Warbler, 3; Tufted Titmouse, 2.5; Veery, 2; Com. Flicker, 1.5; Downy Woodpecker, 1.5; Com. Yellowthroat, 1.5; Yellow-billed Cuckoo, 1; White-breasted Nuthatch, 1, Am. Robin, 1; Wood Thrush, 1; Blue-winged Warbler, 1; N. Oriole, 1; Com. Grackle, 1; Cardinal, 1; Red-eyed Vireo, 0.5; Broad-winged Hawk, +; Ruffed Grouse, +; Hairy Woodpecker, + Great Crested Flycatcher, +; Com. Crow, +. **Total:** 26 species; 44.5 territorial males or females (377/km², 152/100 acres). **Remarks:** The census area was sprayed by helicopter with the mosquito larvicide Abate in early May. Gypsy moths, which had defoliated most oaks in the previous two summers, were significantly reduced in numbers this year. The number of birds nesting

was lower than in the previous two years. Field Sparrows and Nashville Warblers, which nested in previous years, were observed through May 21, but not thereafter. Crows were encountered much more frequently this year and may have nested near the census area. — **WILLIAM E. DAVIS, JR.**, College of Basic Studies, Boston Univ., Boston, Mass. 02215.

46. CLIMAX HEMLOCK - WHITE PINE FOREST, WITH TRANSITION HARD-WOODS. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°43'20"N, 73°12'W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 12 intermittent years. **Size:** 10.52 ha = 26 acres. **Description of Plot:** See AFN 19:594-595 (1965). **Coverage:** Apr. 29-30; May 22; June 5-7, 14. Total man-hours: 21. **Census:** Blackburnian Warbler, 16 (152, 62); Ovenbird, 10 (95, 38); Veery, 8 (76, 31); Black-throated Green Warbler, 7 (67, 27); Red-eyed Vireo, 6 (57, 23); Scarlet Tanager, 5.5 (52, 21); Black-and-white Warbler, 5 (48, 19); Blue Jay, 4 (38, 15); Black-capped Chickadee, 4; Red-breasted Nuthatch, 4; Brown Creeper, 3 (29, 12); Wood Thrush, 3; Ruby-throated Hummingbird, 2; Great Crested Flycatcher, 2; Com. Crow, 2; Solitary Vireo, 2; Yellow-rumped Warbler, 2; Com. Yellowthroat, 2; Brown-headed Cowbird, 2; Rufous-sided Towhee, 2; Barred Owl, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Cardinal, 1; Purple Finch, 1; Broad-winged Hawk, 0.5; N. Oriole, 0.5; Song Sparrow, 0.5; Goshawk, +; Com. Flicker, +; Gray Catbird, +; Am. Robin, +; Hermit Thrush, +; Am. Redstart, +; Rose-breasted Grosbeak, +; White-throated Sparrow, +. **Total:** 38 species; 100 territorial males (950/km², 385/100 acres). **Remarks:** Density increase of slightly over 10% from 1977 creates a new, all-time high. Increased efficiency in sorting out song-territories in the dense woods and high canopies is partly responsible, as, presumably, is the effect of "glades" and sunlight penetration resulting from windfalls (since 1976) and the removal (in 1975) of a few large trees. A new species, Ruby-throated Hummingbird, inhabited these glades. Blackburnian Warbler, at 16, is at a new, all-time species high. Thanks to Jim Cavanaugh. — **ANDREW MAGEE**, 34 Hobson Street, Springfield, Mass. 01109.

47. CLIMAX BEECH - HEMLOCK FOREST. — **Location:** New York; St. Lawrence Co., Shoreline of Cranberry Lake, ¼ mi E of Arnold's Point; 44°15'N, 74°45'W; Cranberry Lake Quadrangle, USGS. **Continuity:** New. **Size:** 8.7 ha = 21.5 acres (compass and range finder). **Description of Plot:** Representative of the climax mixed forest community of this area. As far as known (about 185 yrs.) this plot and surrounding forest has not been logged or burned. A quantitative survey of 24 0.1 acre circles gave the following results: Trees 3 in. in diameter and over, 264/acre; total basal area 207.5 ft²/acre. The component tree species were: Am. Beech (*Fagus grandifolia*), 139, 53, 29, 100; E. Hemlock (*Tsuga canadensis*), 36, 14, 28, 96; dead trees, 28, 11, 11, 92; Sugar Maple (*Acer saccharum*), 21, 8, 14, 96; Red Spruce (*Picea rubens*), 18, 7, 5, 63; Yellow

Birch (*Betula lutea*), 12, 5, 10, 54, Red Maple (*A. rubrum*), 10, 4, 3, 25. Trees by diameter size class. A (3-6 in.) 98, 37, 9.8, 5; B (6-9 in.) 62, 24, 18.6, 9; C (9-15 in.) 55, 21, 45., 22, D (15-21 in.) 56, 23, 42., 20; E (21-27 in.) 18, 7, 55.5, 27; F (27-33 in.) 6, 2, 30.6, 15; G (33-40 in.) 1, 1, 5.9, 3. Shrub stems per acre, 271, ground cover, 54%; canopy cover, 87%; mean canopy heights, 65 ft (range 49-81). **Edge:** Surrounded by similar forest on two sides and lake shore (within 50 m) on two. **Topography:** Slight N slope (1490-1520 ft elevation) toward lake shore. **Coverage:** June 22, 26, 28; July 4-5, 10; 0500-0830. Total man-hours: 20. **Census:** Red-eyed Vireo, 8 (92, 37); Blackburnian Warbler, 8; Swainson's Thrush, 5 (57, 23); Black-throated Green Warbler, 4.5 (52, 21); Red-breasted Nuthatch, 2; Solitary Vireo, 2; Golden-crowned Kinglet, 1; N. Parula, 1; Black-throated Blue Warbler, 1; Yellow-rumped Warbler, 1; Scarlet Tanager, 1; Barred Owl, +; Hairy Woodpecker, +; Great Crested Flycatcher, +; Black-capped Chickadee, +; Brown Creeper, +; Winter Wren, +, Am. Robin, +; Canada Warbler, +; Am. Redstart, +; White-throated Sparrow, +. **Total:** 21 species; 345 territories (397/km², 160/100 acres). **Remarks:** Conducted as an ornithology class project at the Cranberry Lake Biological Field Station. Special thanks to Doug Fraser for assistance. — **BARRY R. NOON**, Biology Dept., Siena College, Loudonville, NY 12211.

48. PITCH PINE - SCRUB OAK BARRENS. — **Location:** New York; Suffolk Co., Westhampton, 0.6 mi S of state road 27 and 0.9 mi W of county road 31: 40°51'23"N, 72°39'46"W, Eastport Quadrangle, USGS. **Continuity:** New. **Size:** 9.67 ha = 23.9 acres (rectangular 244 × 396 m, grid with 30.5 m square units marked off with numbered wooden stakes, measured with transit and steel tape). **Description of Plot:** A representative section of the Dwarf Pine Plains or Pitch Pine-Scrub Oak Barrens, which cover a large area in this region, characterized by scattered dwarfed Pitch Pine (*Pinus rigida*) and scattered to dense thickets of Scrub Oak (*Quercus ilicifolia*). In contrast to other pine barrens on Long Island, which eventually revert to climax oak forest if protected from fire and cutting, larger oak species such as White and Scarlet are absent. Thus, this plant community constitutes a climax type maintained primarily by poor soil and severe local microclimate and secondarily by fire. However, the plot and the surrounding area have apparently not been burned for many years and the pine plains have reportedly existed with little change since colonial days. The Pitch Pine is the only tree species and is rather scattered except in the NW corner where a small dense stand is located. Scrub Oak is the only species in the dominant shrub layer and is 2-5 ft in height with most 3-4 ft. A lower shrub layer 1-2 ft tall is composed largely of Black Huckleberry (*Gaylussacia baccata*) and Late Blueberry (*Vaccinium vacillans*) with some Low Blueberry (*V. pensylvanicum*). True ground cover is predominantly Bearberry (*Arctostaphylos uva-ursi*), which covers nearly all areas not too shaded by trees or shrubs. A moderate amount of Heath-like *Hudsonia ericoides* and a little Woolly Hudsonia (*H. tomentosa*) are also present. Herbaceous plants are thinly scattered throughout in the more open areas

A quantitative survey of ten randomly selected circular 0.1 acre sample plots gave the following results: Pitch Pines, 148/acre; total basal area, 3.93 ft²/acre. Pines/acre by size class: less than 4.5 ft tall, 48; greater than 4.5 ft tall, less than 3 inches in diameter, 20. None are greater than 6 inches in diameter. Most frequent tree height is 6-8 ft and the maximum is 20 ft. Scrub Oak stems/acre: 10,100; ground cover, 96.7%; canopy absent. **Edge:** Similar habitat on all sides. Pitch Pines somewhat taller and denser just W of plot. **Topography:** Slightly rolling. **Elevation:** About 80 ft. **Weather:** Winds generally light. Temperatures ranged from 58-85°, average about 69°F. Cloud cover varied from clear to overcast. **Coverage:** 1977: May 22, 24; June 1, 5, 12, 17, 23, 26; July 2, 10, 14, 16; 0355-1030, EST, except one trip 1200-1300. Total man-hours: 32. **Census:** Rufous-sided Towhee, 13.5 (140, 56); Prairie Warbler, 10 (103, 42); Field Sparrow, 3.5 (36, 15); Com. Yellowthroat, 2; Brown Thrasher, 1.5. **Total:** 5 species; 30.5 territorial males (315/km², 128/100 acres). **Visitors:** Marsh Hawk, Mourning Dove, Yellow-billed Cuckoo, Black-billed Cuckoo, Great Horned Owl, Chimney Swift, E. Kingbird, E. Wood Pewee, Tree Swallow, Barn Swallow, Purple Martin, Black-capped Chickadee, Mockingbird, Am. Robin, Blue-winged Warbler, Red-winged Blackbird, Com. Grackle, Brown-headed Cowbird, Am. Goldfinch and Vesper Sparrow. **Remarks:** One Rufous-sided Towhee nest was located. **1978. Weather:** Winds generally light, temperatures 48-74°F, mostly 55-70, skies varied from clear to overcast and light fog but mostly clear. **Coverage:** Apr. 29; May 7, 19, 26; June 4, 7, 12, 20, 24, 29-30; July 7; 0415-0900, EST (except one 0740-1140. Total man-hours: 28. **Census:** Prairie Warbler, 14.5 (150, 61); Rufous-sided Towhee, 11.5 (119, 48); Field Sparrow, 6 (62, 25); Brown Thrasher, 2; Mockingbird, +; Com. Yellowthroat, +. **Total:** 6 species; 34 territorial males (352/km², 142/100 acres). **Visitors:** Marsh Hawk, Mourning Dove, Tree Swallow, Barn Swallow, Purple Martin, Blue Jay, Black-capped Chickadee, Com. Grackle. **Remarks:** One Rufous-sided Towhee nest was located. — ROBERT ADAMO, JAMES CLINTON, DAVID LARSEN (compiler) and GILBERT RAYNOR, Moriches Bay Audubon Society, Box 802, Center Moriches, N.Y. 11934.

49. RED OAK-WHITE PINE ISLAND. — **Location:** New York; Jefferson Co., 5 mi NE of Alexandria Bay; Ironsides, a 20-acre island in the St. Lawrence River, 44°23'N, 75°51'W, Chippewa Bay Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres. **Description of Plot:** Forest crown closed with 40% understory of shrubs averaging 1 m in height; a 75% herbaceous ground cover; typical undisturbed deciduous forest on St. Lawrence River islands; the trees average 10 m in height and stems average 2.2 m apart. The canopy trees followed by relative density and mean dbh in cm were: Red Oak (*Quercus rubra*) 33%, 32; White Pine (*Pinus strobus*) 16%, 24; Sugar Maple (*Acer saccharum*) 13%, 23; White Oak (*Q. alba*) 11%, 25; White Ash (*Fraxinus americana*) 7%, 23; Red Maple (*A. rubrum*) 5%, 19; Basswood (*Tilia americana*) 4%, 19; Shadbush (*Amelanchier arborea*) 4%, 8; Hemlock (*Tsuga canadensis*) 4%, 24; with N White Cedar (*Thuja occidentalis*), and Red

Pine (*P. resinosa*) making up the remaining 3%. **Edge:** Bounded on all sides by the St Lawrence River. **Topography:** Rock outcrop ridges down both sides of island with low areas between. **Elevation:** 270 ft. **Weather:** Lower than average rainfall during the period. **Coverage:** May 25; June 5-6, 16, 29, 22; July 6, 17, 22, 29; 0700-2000, EDT. Total: 10.5 man-hours. **Census:** Great Blue Heron, 280 (3459, 1400); Am. Robin, 7 (86, 35); House Wren, 6 (74, 30); Song Sparrow, 6; Starling, 5 (62, 25); E. Wood Pewee, 4 (49, 20); Tree Swallow, 4; Rough-winged Swallow, 4; Wood Thrush, 4; Red-eyed Vireo, 4; Yellow Warbler, 4; N. Oriole, 4; Com. Grackle, 4; Great Crested Flycatcher, 3 (37, 15); Gray Catbird, 3; Warbling Vireo, 3; Am. Redstart, 3; Rose-breasted Grosbeak, 3; Downy Woodpecker, 2; Least Flycatcher, 2; Blue Jay, 2; Black-capped Chickadee, 2; White-breasted Nuthatch, 2; Yellow-rumped Warbler, 2; Pine Warbler, 2; Com. Yellowthroat, 2; Red-winged Blackbird, 2; Cardinal, 2; Rufous-sided Towhee, 2; Am. Woodcock, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Veery, 1; Solitary Vireo, 1; Black-and-white Warbler, 1; Nashville Warbler, 1; Ovenbird, 1; White-throated Sparrow, 1. **Total:** 39 species; 383 territorial males (4732/km², 1915/100 acres) [excluding herons, 1273/km², 515/100 acres]. **Visitors:** Com. Loon, Green Heron, Mallard, Wood Duck, Sharp-shinned Hawk, Ruffed Grouse, Killdeer, Herring Gull, Ring-billed Gull, Com. Tern, Rock Dove, Mourning Dove, Great Horned Owl, Chimney Swift, E. Kingbird, E. Phoebe, Com. Crow, Red-breasted Nuthatch, Brown Creeper, Cedar Waxwing, Scarlet Tanager, Chipping Sparrow. **Remarks:** The plot contains the largest known Great Blue Heron colony in New York State. — GEORGE R. MAXWELL II and GERALD A. SMITH, Rice Creek Dept. Zool. State Univ. College, Oswego, N.Y. 13126.

50. SECOND-GROWTH OAK - PITCH FOREST. — **Location:** New York; Suffolk Co., Upton, near NE corner of Brookhaven National Laboratory property, 6000 ft S of state road 25; 40°53'16"N, 72°51'53"W, Wading River Quadrangle, USGS. **Continuity:** New. **Size:** 9.30 ha = 22.97 acres (square, 304.9 × 304.9 m, grid with 30.5-meter squares marked off with numbered wooden stakes, measured with transit and steel tape). **Description of Plot:** A second-growth Oak-Pitch Pine forest in a late stage of succession from Scrub Oak-Pitch Pine forest to climax oak forest. Previous plot history undocumented but last cutting probably 50-70 years ago. Many of the oaks are arranged in tight groups indicating sprout growth from old stumps. No evidence of recent fire. The forest is composed exclusively of White Oak (*Quercus alba*), Scarlet Oak (*Q. coccinea*), Black Oak (*Q. velutina*) and Pitch Pine (*Pine rigida*). The understory is largely composed of saplings of these four species plus some Scrub Oak (*Q. ilicifolia*). The ground cover is composed of Black Huckleberry (*Gaylussacia bacata*), Late Blueberry (*Vaccinium vacillans*), Scrub Chestnut Oak (*Q. prinoides*) and Low Blueberry (*V. pensylvanicum*) with scattered Sweet Fern (*Myrica asplenifolia*), Bayberry (*M. carolinensis*), Staggersbush (*Lyonia mariana*), Bracken (*Pteridium aquilinum*), Wintergreen (*Gaultheria procumbens*) and Pennsylvania Sedge (*Carex pensylvanica*). A

quantitative survey of ten randomly selected 0.1 acre circular sample plots gave the following results: Trees 3 in. in diameter and over 423/acre; total basal area, 55.2 ft²/acre. Species comprising 90% of the total number of trees: Pitch Pine, 133, 15.7, 18.3, 100; White Oak, 290, 34.1, 34.1, 100; Scarlet Oak, 255, 30.0, 30.1, 100; Black Oak, 8, 0.9, 1.2, 60; dead trees, 164, 19.3, 16.3, 100. Trees by diameter size class: A (3-6 in.) 340, 39, 27, 7, 50.2; B (6-9 in.) 69, 9.2, 10.6, 19.2; C (9-15 in.) 14, 1.6, 11.7, 21.2. Scrub stems per acre: 1772, ground cover, 72%; canopy cover 83.8%; average canopy height 33 ft, maximum oak height 61 ft, maximum pine height 49 ft. **Edge:** Bordered on all sides by at least 200 ft of similar forest. **Topography:** Basically flat with a slight depression through part of the plot. **Elevation:** About 80 ft. **Weather:** Winds light, temperatures 52-80°F (averaging about 65°F), cloud cover clear to overcast. **Coverage 1977:** May 24, 26; June 1, 8, 14, 16, 26, 28; July 2, 7, 11, 27; 0400-0900, EST, except two (1330-1630 and 2100-2115). Total man-hours: 28. **Census:** Rufous-sided Towhee, 16 (172, 70), Ovenbird, 7 (75, 30); Blue Jay, 3 (32, 13), Black-and-white Warbler, 3; N. Oriole, 3, Great Crested Flycatcher, 2; Wood Thrush, 2, Whip-poor-will, 1; Downy Woodpecker, 1, Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; Hermit Thrush, 1; Pine Warbler, 1; Com. Yellowthroat, 1; Scarlet Tanager, 1; Com. Flicker, +, Tufted Titmouse, +. **Total:** 18 species; 45 territorial males (484/km², 196/100 acres). **Visitors:** Yellow-billed Cuckoo, Hairy Woodpecker, Mockingbird, Am. Robin, Red-eyed Vireo, Blue-winged Warbler, Com. Grackle and Brown-headed Cowbird. **1978. Weather:** Winds generally light, temperatures 29-74°F, mostly 50-70 skies varied from clear to overcast and light fog, but mostly clear. **Coverage:** 1978: Apr. 29; May 4, 12, 19, 27; June 1, 4, 7, 11, 20, 23; July 1, 2; 0450-0930, EST. Total man-hours: 33. **Census:** Rufous-sided Towhee, 12.5 (134, 54); Ovenbird, 7 (75, 30); Great Crested Flycatcher, 3.5 (38, 15); N. Oriole, 3, 5, Blue Jay, 3 (32, 13); Black-capped Chickadee, 3; Brown Thrasher, 1.5; Hermit Thrush, 1, 5 Scarlet Tanager, 1.5; Tufted Titmouse, 1, Black-and-white Warbler, 1; Pine Warbler, 1, Whip-poor-will, +; Com. Flicker, +; Downy Woodpecker, +. **Total:** 15 species; 40 territorial males (430/km², 174/100 acres). **Visitors:** Yellow-billed Cuckoo, E. Wood Pewee, Wood Thrush, Com. Yellowthroat, Com. Grackle, Brown-headed Cowbird, Cardinal. **Remarks:** One Rufous-sided Towhee nest was found. — JAMES CLINTON, DAVID LARSEN (compiler), GILBERT RAYNOR and JOHN RUSCICA, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934.

51. UPLAND MIXED PINE - SPRUCE - HARDWOOD PLANTATION. — **Location:** New York; Allegany Co., on the S side of Brown Road, near its intersection with the Vandermark Rd., in the town of Ward, 3.5 mi W of Alfred, 42°7'30"N, 77°45'W; Andover Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 16.6 ha = 41 acres. **Description of Plot:** See AB 28 699 (1974). **Weather:** Data furnished by the Alfred Cooperative Weather Station indicated that monthly precipitation (May, 3.81 in.; June, 2.34 in.; July, 2.83 in.) was normal as were the

average mean daily temperatures (May, 61.5°, June, 61.5°, July, 65.25°) Particularly heavy thunderstorms occurred on June 12-13 and July 16; otherwise there were no extremes in either temperature or precipitation that would have adversely affected nesting. **Coverage:** Apr. 17; May 2, 8, 12, 20, 28; June 4, 10, 19, 27, July 17, 23; 0910-2015, EDT. Total man-hours: 16. **Census:** Black-throated Green Warbler, 13 (78, 32); Blackburnian Warbler, 11 (66, 27); Magnolia Warbler, 7 (42, 17); Dark-eyed Junco, 5 (30, 12); Golden-crowned Kinglet, 4.5 (27, 11); Blue Jay, 3 (18, 7); Black-capped Chickadee, 3; Am. Robin, 3; Ovenbird, 3; Brown Creeper, 2; Wood Thrush, 2; Cedar Waxwing, 2; Solitary Vireo, 2; Com. Yellowthroat, 2; Brown-headed Cowbird (females), 2; Indigo Bunting, 2; Chipping Sparrow, 2; Broad-winged Hawk, 1; Downy Woodpecker, 1; Red-breasted Nuthatch, 1; Veery, 1; Yellow-rumped Warbler, 1; Canada Warbler, 1; Scarlet Tanager, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; White-throated Sparrow, 1; Song Sparrow, 1; Red-shouldered Hawk, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; White-breasted Nuthatch, +; Purple Finch, +. **Total:** 33 species; 79.5 territorial males (479/km², 194/100 acres). **Visitors:** Red-tailed Hawk, Barred Owl, Least Flycatcher, Com. Grackle, Evening Grosbeak, Am. Goldfinch. **Remarks:** This was the second year of declining territorial males after an all-time high in 1976. Appreciation is extended to Gaylord Rough for weather data. — ELIZABETH W. BROOKS, *Water Wells Rd., Alfred Station, N.Y. 14803.*

52. MIXED OAK - PINE FOREST I. — Location: Pennsylvania; Luzerne Co., 1 mi NNE of Wapalopen, Pa.; 41°04'N, 76°06'W, Berwick Quadrangle, USGS. **Continuity:** Established 1977 (1978). **Size:** 6.0 ha = 14.8 acres (irregular rectangle, surveyed and measured with staff compass and 50 m tape). **Description of Plot:** The dominant canopy trees are Sweet Birch (*Betula lenta*), White Oak (*Quercus alba*), White Pine (*Pinus strobus*), and Chestnut Oak (*Q. prinus*). The sapling understory is dominated by Sweet Birch, Red Maple (*Acer rubrum*), Red Oak (*Q. rubra*), Chestnut Oak, and Black Oak (*Q. velutina*). The shrub cover is 50% Low-bush Blueberry (*Vaccinium vacillans*) and 15% Mountain Laurel (*Kalmia latifolia*). The ground cover is primarily Ground Pine (*Lycopodium flabelliforme*), Wild Sarsaparilla (*Aralia nudicaulis*), and Hay-scented Fern (*Dennstaedtia punctilobula*). A quantitative survey of the vegetation gave the following results: based on 20 -10 × 10 m square plots for trees 10 cm (3.94 in.) or larger, 585 stems/ha (237/acre), total basal area 16.09 m²/ha (70.1 ft²/acre). Species comprising 90% of the total number of trees (trees followed by number/ha, density (%), dominance, and frequency): Sweet Birch (225, 38, 32, 26), Chestnut Oak (6, 5, 11, 9), Black Oak (55, 9, 6, 13), White Pine (50, 8, 10, 9), Red Oak (45, 8, 7, 7), Red Maple (40, 7, 6, 9), and Virginia Pine (*P. virginiana*) (40, 7, 8, 6). There are an additional 2700 sapling stems/ha (1093/acre) yielding 4.1 m²/ha (18 ft²/acre) of basal area. Age of the trees, based on 15 core samples of 8 species, ranged between 20 and 105 years. **Edge:** Bordered on all sides by similar forest. **Topography:** Basically flat with a slight downward slope in the NE corner. **Elevation:** 335 m

(1100 ft) **1977: Weather:** Mostly cloudy to overcast, temperature range from 9-22.8°C **Coverage:** May 6, 17; June 2, 14, 16; July 1, 12; 0545-0900 or 1830-2000. Total man-hours: 15.5. **Census:** Wood Thrush, 7 (117, 47); Ovenbird, 5 (83, 34); Black-capped Chickadee, 4 (67, 27); Scarlet Tanager, 4; Blue Jay, 3.5 (58, 24); Com. Flicker, 2; Downy Woodpecker, 2; Rufous-sided Towhee, 2; Ruffed Grouse, 1; White-breasted Nuthatch, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5. **Total:** 14 species; 34.5 territorial males (576/km², 233/100 acres). **1978: Weather:** Basically cool mornings, 10-16°C, and overcast skies. **Coverage:** May 10, 12, 16, 25, 31; June 5, 7; 0530-0830. Total man-hours: 14. **Census:** Ovenbird, 6 (100, 41); Wood Thrush, 4 (67, 27); Red-eyed Vireo, 4; Scarlet Tanager, 3 (50, 20); Great Crested Flycatcher, 2; E. Wood Pewee, 2; Blue Jay, 2; Black-and-white Warbler, 2; Brown-headed Cowbird, 2 (females); Ruffed Grouse, 1; Black-capped Chickadee, 1; Tufted Titmouse, 1; Rose-breasted Nuthatch, 1; Rose-breasted Grosbeak, 1. **Total:** 14 species; 32 territorial males or females (534/km², 216/100 acres). **Remarks:** Of note was the decrease in Wood Thrushes in 1978. Special thanks to James D. Montgomery for his assistance in the Botanical analysis. — ROBERT M. RUHE, *Ichthyological Associates, Inc., R.D. 1, Berwick, Pa. 18603.*

53. MIXED OAK - PINE FOREST II. — Location: Pennsylvania; Luzerne Co., 3.4 km NE of Beach Haven and 2.8 km NW of Wapalopen, Pa.; 41°05'N, 76°07'W, Berwick Quadrangle, USGS (15 minute series). **Continuity:** Established 1977 (1978). **Size:** 11.05 ha = 27.3 acres (irregular rectangular, surveyed and measured with staff compass and 30 m tape. Approximately 186 × 550 m with two irregular corners). **Description of Plot:** The dominant canopy trees are Black Oak (*Quercus velutina*) and Flowering Dogwood (*Cornus florida*). The sapling understory is dominated by Dogwood and Red Maple (*Acer rubrum*). The shrub and woody vine layer is dominated by Virginia Creeper (*Parthenocissus quinquefolia*), Grape (*Vitis aestivalis*) and Blackberry (*Rubus allegheniensis*). The ground cover is predominantly *Carex swanii*, *Uvularia sessilifolia*, and *Solidago caesia*. A quantitative survey of vegetation gave the following results: based on 24 -10 × 10 m square plots for trees 10 cm (3.94 in.) or larger, 617 stems/ha (250/acre), total basal area 22.5 m²/ha (98 ft²/acre). Species comprising 90% of the total number of trees (trees followed by number/ha, density (%), relative dominance, and relative frequency): Black Oak (129, 21, 36, 16), Dogwood (96, 15, 5, 15), Virginia Pine (*Pinus virginiana*) (104, 17, 20, 11), Chestnut Oak (*Q. prinus*) (38, 6, 5, 10), Red Maple (50, 8, 7, 9), White Pine (*P. strobus*) (62, 10, 7, 8), Mockernut Hickory (*Carya tomentosa*) (25, 4, 2, 6), Black Cherry (*Prunus serotina*) (38, 6, 5, 5), White Ash (*Fra inus americana*) (17, 3, 2, 5), White Oak (*Q. alba*) (8, 1, 4, 2), Sweet Cherry (*P. avium*) (8, 1, 1, 2). There were an additional 1208 saplings/ha (489/acre) yielding 2.6 m²/acre) of basal area. **Edge:** Bordered on three sides by similar forest; the S end by a transmission power line corridor and a rural dirt road. **Topography:** Steeply sloping downward from N to S. Average slope approx-

imately 30% **Elevation:** 183-305 m (600-1000 ft) **1977: Weather:** Half sunny and half overcast. Temperature from 8.3-22°C. **Coverage:** May 3-4, 12-13, 24; June 19; July 13; between sunrise and 0900. Total man-hours: 13.5. **Census:** Wood Thrush, 6 (54, 22); Blue Jay, 5.5 (50, 20); Black-capped Chickadee, 5.5; Cardinal, 3.5 (32, 13); Tufted Titmouse, 3 (27, 11); Scarlet Tanager, 3; Rufous-sided Towhee, 2.5; Am. Robin, 2; Ovenbird, 2; Downy Woodpecker, 1; Blue-gray Gnatcatcher, 1, Com. Yellowthroat, 1; Indigo Bunting, 1, E. Wood Pewee, 0.5; Com. Flicker, +; White-breasted Nuthatch, +; Red-eyed Vireo, + **Total:** 17 species; 37.5 territorial males (339/km², 137/100 acres). **1978: Weather:** Basically cool mornings, 11-14°C and overcast skies **Coverage:** May 10, 12, 16, 25, 31; June 6-7, sunrise to 0900. Total man-hours: 15. **Census:** Wood Thrush, 7 (63, 26); Brown-headed Cowbird, 4 (36, 15); Scarlet Tanager, 4; Black-capped Chickadee, 3 (27, 11); Red-eyed Vireo, 3; Ovenbird, 3; Tufted Titmouse, 2; Gray Catbird, 2; Black-and-white Warbler, 2; Cardinal, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Great Crested Flycatcher, 1, E. Wood Pewee, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Am. Redstart, 1; N. Oriole, 1; Am. Woodcock, +; Great Horned Owl, +; Com. Flicker, +; Least Flycatcher, +; Com. Yellowthroat, +; Indigo Bunting, +. **Total:** 25 species; 43 territorial males or females (cowsbirds) (389/km², 158/100 acres). **Remarks:** Special note of thanks to J. D. Montgomery for his assistance in the botanical analysis, and D A Gross for his aid on several counts. — ROBERT M. RUHE, *Ichthyological Associates, Inc., R.D. 1, Berwick, Pa. 18603.*

54. MOUNTAIN TOP, MIXED HARDWOOD - WHITE PINE FOREST. — Location: Pennsylvania; Westmoreland Co., 10 mi SSW of Ligonier, 6 mi S of Laughlinton in Forbes State Forest on the top of Laurel Mountain; 40°07'18"N, 79°10'47"W, Bakersville Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28 1014 (1974). **Weather:** Sunny, except for one rainy day; mostly warm and clear. **Coverage:** June 3-4, 6-7, 10-11; 0500-0930, 1200-1300, and 1700-1930. Total party-hours: 9. **Census:** Red-eyed Vireo, 6.5 (107, 43); Ovenbird, 5 (82, 33); Solitary Vireo, 3.5 (58, 23); Rufous-sided Towhee, 3.5; Canada Warbler, 3 (49, 20), Veery, 2.5; Scarlet Tanager, 2; Dark-eyed Junco, 2; Black-capped Chickadee, 1.5, Black-throated Blue Warbler, 1.5; Com. Yellowthroat, 1.5; E. Wood Pewee, 1; Hermit Thrush, 1; Chipping Sparrow, 1; Am. Robin, 0.5; Com. Flicker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow +; Gray Catbird +; Rose-breasted Grosbeak, +. **Total:** 21 species; 36 territorial males (593/km², 240/100 acres). **Visitors:** Cedar Waxwing, Magnolia Warbler. — R. CARRELL ABBOTT (compiler), *Audubon Society of Western Pennsylvania, Pittsburgh, Pa.*

55. CENTRAL HARDWOOD FOREST WITH SCATTERED PINE. — Location: Washington, D.C., Rock Creek Park, lying S of Military Road and W of Rock Creek. **Continuity:** Established 1948; 19 intermittent

years **Size:** Until 1961, 80 acres, since 1961, 26.3 ha = 65 acres **Description of Plot:** See *AFN* 2:153-154 (1948). **Weather:** In general, clear and warm, average temperature 72°F. **Coverage:** Apr. 2, 30; May 7, 24; June 1, 9, 15, 20, 25, 27; July 7. Total 13 trips, 9 at 0600-1115 hours; one at 1055-1500; 3 at 1300-1900. EST. Total man-hours: 33. **Census:** Red-eyed Vireo, 9 (34, 14); Red-bellied Woodpecker, 5 (19, 8); Tufted Titmouse, 4 (15, 6); Wood Thrush, 4; Ovenbird, 4; Carolina Chickadee, 3.5 (13, 5); Cardinal, 3.5; Downy Woodpecker, 3 (11, 5); Blue Jay, 3; Scarlet Tanager, 3; Hairy Woodpecker, 2; White-breasted Nuthatch, 2; Com. Flicker, 1; Pileated Woodpecker, 1; Com. Crow, 1; Veery, 1; E. Wood Pewee, 0.5. **Total:** 17 species; 50.5 territorial males (192/km², 78/100 acres). **Remarks:** Nests found: Red-bellied Woodpecker, Carolina Chickadee, Tufted Titmouse, 1 each. The total of 17 species is lower than last year's 21 and the total of 50.5 territorial is much lower than last year's 77. In 1948, the first year of the census, there were 29 species and 235 pairs per 100 acres. These figures reflect the rapid loss of summer residents that has been going on in the Washington area, chiefly involving vireos, warblers, flycatchers, and thrushes. Factors which are being studied as possible causes are loss of nearby similar habitat and greater human use as well as deforestation and pollution of these migrant's wintering grounds. The preceding two severe winters probably resulted in the complete absence of Carolina Wrens in 1977 and 1978. There had been 8 pairs in 1973 and 6.5 in 1974 (no census in 1975-76). — *JOAN H. CRISWELL (compiler), RICHARD VINE, ROBERT FORD, MERWIN TERRY, Audubon Naturalist Society, 8940 Jones Mill Road, Washington, D.C. 20015.*

56. TAMARACK BOG AND HARDWOOD. — **Location:** Michigan; Berrien Co., 1 mi SW of Stevensville, in Grand Mere State Park, 0.05 mi N of Willow Drive on Wishart Road; 41°59'30"W, 86°33'W, Bridgman Quadrangle. **Continuity:** Established 1976; 3 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See *AB* 30:1049 (1976). **Weather:** Normal. **Coverage:** June 4, 11, 18, 25, July 2, 4, 9, 16; 0700-1000 hrs. Total man-hours: 8. **Census:** Veery, 3 (35, 14); Great Crested Flycatcher, 2; Blue Jay, 2; Wood Thrush, 2; Canada Warbler, 2; Mourning Dove, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Am. Robin, 1; Red-eyed Vireo, 1; Ovenbird, 1; Scarlet Tanager, 1; Cardinal, 1; Tufted Titmouse, 0.5; Black-billed Cuckoo, +; Com. Flicker, +; Black-capped Chickadee, +. **Total:** 20 species; 22.5 territorial males (265/km², 107/100 acres). **Remarks:** Nests found: robin, Wood Thrush. Population density was at a three-year height. — *ALBERT MORSE, JAMES MULLINS (compiler), 2558 Locust Lane, Stevensville, Mich. 49127.*

57. MIXED HARDWOOD AND HEMLOCK RAVINES. — **Location:** Ohio; Jackson Co., Jackson Township, Sec. 23, Leo Petroglyph State Memorial; 39°07'30"N, 82°37'30"W, NW/4 Jackson Quadrangle, USGS. **Continuity:** New. **Size:** 4.86 ha = 12 acres.

Description of Plot: Three of the 12 acres are used for parking and picnicking. The remaining 9 acres consist of relatively undisturbed second-growth forest. (The area is unglaciated Mississippian rock.) It has two distinct habitat types, a sandstone gorge habitat filled with hemlock and an upland habitat surrounding the gorge that is predominantly hardwood. The dominant canopy trees are: Red Oak (*Quercus borealis*), Hemlock (*Tsuga canadensis*), and Tulip-tree (*Liriodendron tulipifera*). This is a small unique plot and these trees and others occur in pockets where they are dominant. None are generalized throughout the area. The understory is sparse containing only a few dogwoods. The ground cover varies widely with the season grading from profuse wildflowers in spring to heavy Poison Ivy and fern cover in summer. A quantitative survey shows: trees 3 in. in diameter and over, based on 10 circular samples 193/acre; total basal area 143.8 ft²/acre. Species comprising 99% of the total number of trees: Hemlock, 46, 24, 18, 60; Sugar Maple (*Acer saccharum*), 28, 14, 5, 30; Red Maple (*A. rubrum*), 17, 9, 10, 50; Red Oak, 15, 8, 22, 50; Musclewood, 14, 7, 1, 30; White Oak, 13, 7, 9, 60; Tulip-tree, 13, 7, 15, 40; Sourwood, 9, 5, 1, 50; Dogwood, 8, 4, 5, 40; Sweet Pignut Hickory, 8, 4, 2, 60; Black Oak, 7, 4, 8, 40; Am. Beech, 4, 2, 1, 20; Mockernut Hickory, 4, 2, 2, 10; Pignut Hickory, 3, 2, 2, 20; Black Gum, 2, 1, 0.6, 10; Sassafras, 1, 0.5, 0.1, 10; Black Walnut, 1, 0.5, 2, 10. Trees by diameter size class followed by numbers per acre, relative density (%) basal area (ft²/acre), relative dominance (%): A (3-6 in.) 63, 32.6, 6.3, 4.4; B (6-9 in.) 37, 19.2, 7.8, 5.4; C (9-15 in.) 58, 30, 47.2, 32.8; D (15-21 in.) 20, 10.4, 36, 25; E (21-29 in.) 15, 7.8, 46.5, 32.3. Ground cover except under the Hemlock stands is 95%; canopy cover from 60% to 85%; average canopy height 80 ft. **Edge:** Bordered on the three high sides by pasture land or hay fields and on the fourth lowland side by an overgrown pasture with the creek exiting from the site. A 2-acre parking lot is immediately surrounding the N and E edges of the site. **Topography:** Sandstone cliffs of from 20-65 ft face the ravines and create a deep gorge through the center of the site. **Elevation:** 700-800 ft. **Weather:** Normal. **Coverage:** May 16-June 22; 7 trips. Total man-hours: 25. **Census:** Acadian Flycatcher, 3 (62, 25); Am. Robin, 3; Red-eyed Vireo, 3; Yellow-billed Cuckoo, 2; Com. Flicker, 2; Great Crested Flycatcher, 2; E. Phoebe, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Wood Thrush, 2; Blue-gray Gnatcatcher, 2; Worm-eating Warbler, 2; Scarlet Tanager, 2; Chipping Sparrow, 2; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Com. Crow, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; N. Parula, 1; Kentucky Warbler, 1; Cerulea Warbler, 1; Indigo Bunting, 1; Brown-headed Cowbird, +. **Total:** 25 species; 41 territorial males (844/km², 342/100 acres). **Remarks:** Ten nests were found: 2 flicker, 2 phoebe, 1 Acadian Flycatcher, 1 Com. Crow, 1 White-breasted Nuthatch, 2 robin, 1 Blue-gray Gnatcatcher. — *ANN BINGAMAN (compiler), TOM WOOD and ESTHER REICHELDERFER, Ohio Historical Society, 1982 Velma Ave., Columbus, Ohio 43211.*

58. LONG-LEAF PINE - WATER OAK FOREST. — **Location:** Mississippi; Walthall

Co., 8 mi N of Tylertown, at approximately 31°8'N, 90°9'W. **Continuity:** New. **Size:** 14.6 ha = 36 acres (rectangular, unsurveyed). **Description of Plot:** The dominant canopy trees are Long-leaf Pine (*Pinus palustris*) and Water Oak (*Quercus nigra*). The most prominent in the understory are Flowering Dogwood (*Cornus florida*), Holly (*Ilex opaca*), and Wax Myrtle (*Myrica cerifera*). The ground cover is primarily Broom Sedge (*Andropogon virginicus*), Greenbrier (*Smilax rotundifolia*), and Poison Oak (*Rhus toxicodendron*). A quantitative survey of vegetation yielded the following data: Trees, 4 in. diameter and over, based of the random-pairs sampling of 100 various trees: Long-leaf Pine 59%, Water Oak 24%, Sweet gum (*Liquidambar styraciflua*) 12%, Laurel Oak (*Q. laurifolia*) 3%, others less than 3%. Ground cover is approximately 85%, canopy cover is approximately 70%, with an average canopy height of about 35 ft. **Edge:** Bordered on all sides by similar forest. **Topography:** Flat land, gradually sloping toward a creek hollow. **Weather:** 77-86° and slightly humid throughout the entire census period. **Coverage:** Mar. 25-26; Apr. 1-2, 22-23; 1300-1500 hours. Total man-hours: 18. **Census:** Carolina Wren, 9 (62, 25); Mockingbird, 6 (41, 17); Bobwhite, 5 (34, 14); Wood Thrush, 5; Black Vulture, 4 (27, 11); Red-headed Woodpecker, 4; E. Kingbird, 4; Brown Thrasher, 4; Com. Flicker, 3 (21, 8); Field Sparrow, 3; Yellow-billed Cuckoo, 2; Barred Owl, 2; Blue Jay, 2; Com. Crow, 2; Red-shouldered Hawk, 1; Great Crested Flycatcher, 1. **Total:** 16 species; 57 territorial males (391/km², 158/100 acres). Special Thanks to James Sappington for help. — *MICKEY D. LUTER, 104 S. Adams St, Tylertown, Miss. 39667.*

59. MIXED PINE - HARDWOOD FOREST. — **Location:** Texas; Angelina Co., Angelina College property, 1.6 m S of intersection of Loop 287 and US 59; 31°17'34"N, 94°44'1"W, Lufkin Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 6.31 ha = 15.6 acres. **Description of Plot:** See *AB* 28: 1016 (1974). **Weather:** Most days had clear to partly cloudy skies; precipitation was below normal throughout spring and summer. Temperatures 65-74°F. **Coverage:** May 15-16, 22-24, 26, 29-30; 0800-0900 with an average of 60 min/trip. Total man-hours: 8. **Census:** Cardinal, 8 (127, 51); White-eyed Vireo, 6 (95, 38); Red-eyed Vireo, 3 (48, 19); Hooded Warbler, 3; Yellow-billed Cuckoo, 2; Carolina Chickadee, 2; Tufted Titmouse, 2; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Acadian Flycatcher, 1; Carolina Wren, 1; Swainson's Warbler, 1; Kentucky Warbler, 1. **Total:** 13 species; 32 territorial males (507/km², 205/100 acres). **Remarks:** No nests were found. The Red-billed Woodpecker was added to the list of probable nesters. Population densities for most species indicated little change with the exception of the Carolina Wren which seemed to have not recovered from the severe winters of 1976 and 1977. — *LOUIS DEBETAZ, Angelina College, Lufkin, Tex. 75901.*



60. UPLAND SCOTCH PINE PLANTATION. — **Location:** New York, Allegany Co., 2 mi WSW of Alfred, bordering on the W side of Lake Rd, adjacent to the conifer plantings on the E side of Foster Lake; 42°7'30"N, 77°45'W, Andover Quadrangle, USGS. **Continuity:** Established 1969; 10 consecutive years. **Size:** Approximately 9.3 ha = 23 acres. **Description of Plot:** See *AFN* 23:743-744 (1969). No Christmas trees were harvested this year; the remaining original Scotch Pine trees are now in the 10-18 ft. range. The more recently planted sections of spruce and the second growth sent up from the cut stubs are in the 3-8 ft range. There is increased open space with bramble and choke-cherry growth. **Weather:** Data furnished by the Alfred Cooperative Weather Station indicated that monthly precipitation (May, 3.81 in.; June, 2.34 in.; July, 2.83 in.) was within normal range as were the average mean daily temperatures (May, 61.5°F; June, 61.5°F; July, 65.25°). Particularly heavy thunderstorms occurred on June 12-13 and July 16; otherwise there were no extremes in either temperature or precipitation which would have adversely affected nesting. **Coverage:** May 7, 19, 26; June 2, 9, 17, 24; July 7, 17, 24, 30; Aug. 6, 14; 0900-2015 EDT. Total man-hours: 19. **Census:** Song Sparrow, 19 (204, 83); Chipping Sparrow, 17 (183, 74); Com. Yellowthroat, 6 (64, 26); Field Sparrow, 5 (54, 22); Cedar Waxwing, 4 (43, 17); Purple Finch, 4; Am. Woodcock, 3 (32, 13); Am. Robin, 3; Yellow-rumped Warbler, 3; Brown-headed Cowbird (females), 3; Alder Flycatcher, 2; Rufous-sided Towhee, 2; Tree Swallow, 1; Gray Catbird, 1; Brown Thrasher, 1; Nashville Warbler, 1; Magnolia Warbler, 1; Indigo Bunting, 1; Black-throated Green Warbler, 0.5; Bobolink, +; Cardinal, +. **Total:** 21 species; 77.5 territorial males (833/km², 337/100 acres). **Visitors:** Red-shouldered Hawk, Broad-winged Hawk, Blue Jay, Black-capped Chickadee, Am. Goldfinch. **Remarks:** Nests documented: Chipping Sparrow, 5; Song Sparrow, 5; Purple Finch, 4; Cedar Waxwing, 3; Yellow-rumped Warbler, 3; Alder Flycatcher, 2; Am. Robin, 2; Tree Swallow (in a nest box), 1; Magnolia Warbler, 1; Rufous-sided Towhee, 1. One Purple Finch nest and the Magnolia Warbler nest were parasitized by cowbirds. Of 27 nests found, all but 3 were located in the section of 6-8 ft spruce at the S end of the plot. Black-throated Green Warbler was new to the list of residents. Territorial male Song Sparrows (19) were significantly low (26 is the average over the past 10 years). Total territorial males was the lowest since 1969. Changing habitat over the past 10 years has resulted in gradual declines for robins, Field and Chipping Sparrows, and significant increases in yellowthroats and Cedar Waxwings. Appreciation is extended to Alice Foster for permission to conduct this study on her land; to Clarence Klingensmith for assistance with field work; and to Gaylord Rough for weather data. — *ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N.Y. 14803.*

61. YOUNG SPRUCE FOREST. — **Location:** Maine; Hancock Co., Deer Isle, 0.35 mi N of Stinson Point, 44°10'N, 43°W, Deer Isle Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 4.05 ha = 10 acres. **Description of Plot:** See *AB* 32:72 (1978). **Weather:** Warm

and very dry throughout summer. Some light rain and fog during census period. Temperature 58-85°F. **Coverage:** July 14-16, 20-21; 0600-1000, EST. Total man-hours: 5. **Census:** Magnolia Warbler, 8 (198, 80); Am. Redstart, 4 (99, 40); Black-throated Green Warbler, 3 (74, 30); White-throated Sparrow, 2.5; Winter Wren, 1.5; Swainson's Thrush, 1.5; Cedar Waxwing, 1.5; Black-and-white Warbler, 1.5; Ruffed Grouse, 1; Com. Flicker, 1; Downy Woodpecker, 1; Am. Robin, 1; Mourning Dove, +; Olive-sided Flycatcher, +; Am. Goldfinch, +. **Total:** 15 species; 27.5 territorial males 680/km², 275/100 acres). **Visitors:** Com. Crow, Com. Raven. **Remarks:** Individual count may be low for some species, but absent species vis-a-vis 1977 (E. Wood Pewee, Red-breasted Nuthatch, Gray Catbird, Starling, Nashville Warbler, Purple Finch, Dark-eyed Junco, were not observed during remainder of July. — *THOMAS L. CROWELL and KENNETH L. CROWELL, Sunset, Me. 04683.*

62. RED PINE PLANTATION. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris; 41°42'30"N, 73°10'W, Litchfield Quadrangle, USGS. Bounded on the NW by an old stone wall, on the E by Chestnut Hill Road and on the SW by Pitch Road. **Continuity:** New. **Size:** 8.5 ha = 21 acres (roughly trapezoidal, 600 NW × 750 NE × 1100 E × 1950 ft. SW). **Description of Plot:** The chief overstory is 60-year old Red Pine (*Pinus resinosa*), averaging 70 ft in height, with about 40% canopy coverage. Average dbh is 18 in. and distance between stems varies, but often found to be 26 ft. Periodic thinning over the past 40 years has permitted a mixed hardwood forest sub-canopy to develop. Average canopy coverage of the sub-canopy ranges from 10% at the N end to 40% at the S end. The dbh ranges from 8-12 in. and distance between stems varies greatly. Height of sub-canopy ranges from 45 ft at the N end to 25-30 ft at the S end. The predominant species composition of the sub-canopy is Sugar Maple (*Acer saccharum*), Red Maple (*A. rubrum*), White Ash (*Fraxinus americana*), Black Birch (*Betula lenta*), Red Oak (*Quercus rubra*), White Oak (*Q. alba*), hickory (*Carya* sp.). The understorey, 10-12 ft, is composed of scattered dense patches of saplings and shrubs. The relative abundance of species varies greatly in relation to the moisture gradient on the census area. Saplings comprise about 80% of the understorey, including Yellow Birch (*B. lutea*), White Oak, hickory, Sugar Maple, Red Maple, and Black Birch. E. Hemlock (*Tsuga canadensis*), White Pine (*P. strobus*), White Spruce (*Picea glauca*) saplings, Winterberry Holly (*Ilex verticillata*), Highbush Blueberry (*Vaccinium corymbosum*), Spicebush (*Lindera benzoin*), Alternate-leaf Dogwood (*Cornus alternifolia*), and European Honeysuckle (*Lonicera xylosteum*) comprise a major portion of the additional 20% canopy coverage. The ground cover is rich in diversity, especially in the swamp at the S end. This area is covered by a variety of ferns, as well as Skunk Cabbage (*Symplocarpus foetidus*) and various grasses. The central and N portions include patches of ferns and woodland grasses. Oak, hickory, maple and ash seedlings occur throughout the plot. **Edge:** Bounded on the N and E by oak-hickory forest stands ranging in age from

50-70 years and on the SW by mature oak-hickory forest. A stream runs adjacent to the Red Pine Plantation along the SW border. The overstorey consists of Red Maple, Sugar Maple, Black Cherry, Yellow Birch and White Ash with a canopy coverage of about 30%. The understorey is dense, coverage 50-100% in some places, composed of Spicebush, Arrowwood Viburnum (*Viburnum recognitum*), Alternate-leaf Dogwood, willow (*Salix* sp.), Narrowleaf Spirea (*Spiraea alba*), Choke Cherry (*Prunus virginiana*), and Gray Dogwood (*Cornus racemosa*). The predominant ground cover species are ferns, Jewelweed (*Impatiens pallida*), oak, ash and maple seedlings. **Topography:** Elevation at the N end is 900 ft, sloping S to 800 ft. The N and central portions of the plot are fairly hilly, with slopes averaging 8-15%. The S portion levels off into a swamp, slopes averaging 3-5%. **Coverage:** Apr. 30; May 22; June 6, 8-9, 13-14. Hours 16. **Census:** Ovenbird, 15 (176, 71); Veery, 7 (82, 33); Red-eyed Vireo, 6 (71, 29); Wood Thrush, 5 (59, 24); Solitary Vireo, 5; Blackburnian Warbler, 5; Black-capped Chickadee, 4 (47, 19); Black-and-white Warbler, 3.5 (41, 17); Blue Jay, 3 (35, 14); Gray Catbird, 3; Com. Yellowthroat, 3; Scarlet Tanager, 3; Rufous-sided Towhee, 3; Blue-gray Gnatcatcher, 2.5; Ruffed Grouse, 2; Am. Robin, 2; Louisiana Waterthrush, 2; Rose-breasted Grosbeak, 1.5; Barred Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Brown Creeper, 1; Blue-winged Warbler, 1; Brown-headed Cowbird, 1; Broad-winged Hawk, 0.5; Com. Crow, 0.5; Chestnut-sided Warbler, 0.5; N. Oriole, 0.5; E. Wood Pewee, +; Am. Redstart, +. **Total:** 34 species; 87.5 territorial males (1030/km², 417/100 acres). **Remarks:** While the Red Pine dominates and/or forms the main canopy, there are sections of hardwoods, sometimes occurring in sinks or alongside streams. Only the Solitary Vireo, Blackburnian Warbler and Red-breasted Nuthatch seemed specifically attached to the Red Pines. Thanks to Jim Cavanaugh. — *ANDREW MAGEE, 34 Hobson Street, Springfield, Mass. 01109.*

63. MIXED FOREST, OLD FIELD AND HOMESITE. — **Location:** Vermont; Windsor Co., 1.5 mi S of Woodstock Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 10.9 ha = 27 acres. **Description of Plot:** See *AB* 27:982 (1973). **Weather:** Mild and humid end of May; wet and warm June 1-9; cloudy and cool last part of June; hot and humid for last three trips. Temperature 40-74°F. **Coverage:** May 24, 28, June 1, 3-4, 8-9, 14, 17, 28; July 10; August 4, 9, 13; 0600-0830 or 1730-1930. Total man-hours: 25. **Census:** Red-eyed Vireo, 12 (110, 44); Ovenbird, 10 (92, 37); Veery, 9 (82, 33); Am. Robin, 8 (73, 30); Song Sparrow, 8; Black-capped Chickadee, 7 (64, 26); Com. Yellowthroat, 6 (55, 22); Wood Thrush, 5 (46, 19); Black-and-white Warbler, 4 (37, 15); Least Flycatcher, 3 (27, 11); Tree Swallow, 3; Gray Catbird, 3; Cedar Waxwing, 3; Red-winged Blackbird, 3; Hairy Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Blue Jay, 2; Warbling Vireo, 2; Am. Redstart, 2; N. Oriole, 2; Rose-breasted Grosbeak, 2; Am. Goldfinch, 2; Chipping Sparrow, 2; Downy Woodpecker, 1.5; Ruby-throated

Hummingbird, 1, Yellow-bellied Sapsucker, 1, E. Kingbird, 1, White-breasted Nuthatch, 1, House Wren, 1; Hermit Thrush, 1; E. Bluebird, 1; Solitary Vireo, 1; Yellow Warbler, 1; Black-throated Green Warbler, 1; Chestnut-sided Warbler, 1; Bobolink, 1; Com. Grackle, 1, Brown-headed Cowbird, 1; Scarlet Tanager, 1; Indigo Bunting, 1; White-throated Sparrow, 1; Ruffed Grouse, 0.5; Black-billed Cuckoo, 0.5; Barn Swallow, 0.5. **Total:** 45 species; 124 territorial males or females (1135/km², 459/100 acres). **Remarks:** For the first time since 1974 Wood Thrush was not among the first 6 in order of abundance. Canada Warbler went farther downstream, out of the plot. Bobolink, however, took up a territory for the first time. Thirty nests were found, 9 in boxes. — **JULIA NICHOLSON**, Vermont Institute of Natural Science, Woodstock, Vt. 05091.

64. FIELD REGENERATION 11-12 YEARS. — **Location:** Massachusetts; Plymouth Co., Town of Kingston, 2 mi SW of South Duxbury Center; 42°00'N, 70°43'W, Duxbury Quadrangle, USGS. **Continuity:** New. **Size:** 4.34 ha = 10.73 acres (a nearly regular area within a rectangle with sides running NE-SW and NW-SE, surveyed). **Description of Plot:** The area lies within what is probably the oldest continuously farmed field in the United States, having been established in 1628 or 1630. For the last 11 years the plot has been allowed to undergo natural regeneration. There is no tree layer present; prominent shrub layer species >1 m tall in order of density were Arrow-wood (*Viburnum dentatum*) 46%, Red Cedar (*Juniperus virginiana*) 36%, Black Cherry (*Prunus serotina*) 8%, Black Blueberry (*Vaccinium atrococcum*) 2%, Am. Elm (*Ulmus americana*) 2%, and Spindle-tree (*Euonymus europaeus*) 2%. A survey of 4 random 25 × 25 m plots gave the following results for shrubs >1 m: Arrow-wood 241 stems or clumps of stems/acre, average ht. 1.7 m (max. 2.5 m); Red Cedar 186/acre, average ht 2.3 m (max. 3.5 m); Black Cherry 40/acre, average ht 2.3 m (max. 2.5 m); Black Blueberry, Am. Elm and Spindle-tree 11/acre. Mean shrub cover was 23%. Within the shrub sample plots a survey of 20 random 1 m squares showed 7 species of grasses, sedges and rushes as the dominant group in the herb layer (<1 m tall) with 78%, mean cover, and extensive mats of Haircap Moss (*Polytrichum commune*) covering 16% of the ground. In order of decreasing density, the 5 commonest dicotyledons present were Blackberry (*Rubus* sp.) 28 stems/1 m², mean ht 17 cm; Hairy Golden-rod (*Solidago rugosa*) 24/1 m², mean ht 81 cm; Decumbent Cinquefoil (*Potentilla simplex*) 12/1 m², mean ht 9 cm; Butter-and-Eggs (*Linaria vulgaris*) 9/1 m² mean ht 20 cm; Ribwort Plantain (*Plantago lanceolata*) 8/1 m², mean ht 20 cm; average herb layer cover was 95%. The plot was carefully chosen to ensure uniform habitat, and was surrounded by similar vegetation, except at the junction with an area of hay-cropped meadow (see census x). **Topography:** Essentially flat. **Elevation:** 15 ft. **Weather (1977):** Observations were confined to fairly clear days without precipitation when winds were light SW - NW; temperature range 15°-26°C (59°-79°F). **Coverage:** 1977: June 17, 21, 25, 28; July 1, 6-7, 11, 16, 20, August 11; 0515-0750, EDST. **Total man-hours:** 20. **Census:** Red-winged Blackbird, 11

(253, 103), Song Sparrow, 8 (184, 75), Bobwhite, 1.5, Yellow Warbler, 1, Am. Kestrel, 0.5; Mockingbird, 0.5; Com. Yellowthroat, 0.5. **Total:** 7 species; 23 territorial males (530/km², 214/100 acres). **Visitors:** Chimney Swift, Bobolink, Am. Goldfinch. **Remarks:** The Am. Kestrel was occupying a nest box on the only tree. The census is of particular local interest because of the continuing decline of meadow habitat throughout New England; the adjoining meadow, which is mown annually for hay, held a similar number of bird territories dominated by Bobolinks. **Weather (1978):** Fairly clear days without precipitation; winds light and variable; temperature range 58°-80°F. **Coverage:** 1978: May 30; June 1, 5, 7, 13, 16, 19-20, 24-25, 29; July 1, 6; 0545-0930 EDST. **Total man-hours:** 27. **Census:** Red-winged Blackbird, 15 (345, 140); Song Sparrow, 12 (276, 112); Bobwhite, 2; Com. Yellowthroat, 1.5; Am. Robin, 1; Yellow Warbler, 1; Am. Goldfinch, 1; Cedar Waxwing, 0.5; Cardinal, 0.5. **Total:** 9 species; 34.5 territorial males (794/km², 322/100 acres). **Visitors:** Bobolink, E. Meadowlark, Brown-headed Cowbird, Purple Finch. **Remarks:** Species in 1978 were similar to 1977 with a slight increase in both Red-winged Blackbirds and Song Sparrows. The work in both 1977 and 1978 was carried out with the assistance of 7 of the intern staff of Manomet Bird Observatory. Grateful thanks to them, and to the Plymouth Five Cents Savings Bank for a generous grant which completely supported the work. I am further indebted to Chester L. Heckman and the Walker family of Duxbury for historical assistance, and for permission to census their land. — **TREVOR L. LLOYD-EVANS**, Manomet Bird Observatory, Manomet, Mass. 02345.

65. ABANDONED NURSERY WITH HEDGEROWS. — **Location:** Connecticut; New London Co., Town of Waterford; 0.15 mi S intersection of State Rt. 156 and Power Station Rd, 41°19'10"N, 72°10'W, Niantic Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 14.2 ha = 35.08 acres. **Description of Plot:** See AB 32:73-74 1978. **Weather:** Cool spring; average precipitation. **Coverage:** May 6, 27, 31; June 2, 7, 17, 19; Aug. 27; mostly 0500-0700. **Total man-hours:** 24. **Census:** Red-winged Blackbird, 22 (155, 63); Com. Yellowthroat, 12 (85, 34); Yellow Warbler, 10 (70, 29); Song Sparrow, 10; Gray Catbird, 7 (49, 20); Willow Flycatcher, 5 (35, 14); Am. Robin, 4 (28, 11); Am. Goldfinch, 3 (21, 9); Com. Flicker, 2; Blue Jay, 2; Cardinal, 2; House Finch, 2; Field Sparrow, 2; Bobwhite, 1; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; E. Kingbird, 1; Mockingbird, 1; Brown Thrasher, 1; Starling, 1; White-eyed Vireo, 1; Brown-headed Cowbird, 1; Swamp Sparrow, 1; Wood Thrush, +. **Total:** 24 species; 93 territorial males or females (655/km², 265/100 acres). **Visitors:** Green Heron, Glossy Ibis, Mallard, Wood Duck, Am. Kestrel, Mourning Dove, Barn Swallow, Com. Crow, Cedar Waxwing, Com. Grackle, Rufous-sided Towhee. **Remarks:** An attempted nesting by Glossy Ibis was aborted by racoon predation. A decrease in variety and number of breeders was noted in comparison to previous year. Losses in breeding species include Am. Woodcock, Mourning Dove, House Wren, Chestnut-sided Warbler, E. Meadowlark, and

Rufous-sided Towhee New breeders were Mockingbird, Wood Thrush, and Swamp Sparrow. Significant decreases in numbers of Yellow Warbler (33%) and Am. Goldfinch (62%) were also noted. We thank Northeast Utilities for permission to conduct the census and Andrew and Steven Dasinger for help in clearing paths. — **GRACE BISSEL and BRUCE DASINGER** (compiler), 12 Stone Cliffe Drive, Niantic, Conn. 06357.

66. MIXED UPLAND HABITAT AND SWAMP. — **Location:** Connecticut; Fairfield Co., Newtown, intersection of Route 34 and Zoar Rd; 41°24'N, 73°14'W, Southbury Quadrangle, USGS. **Continuity:** Established 1968, 11 consecutive years. **Size:** 14.17 ha = 35 acres. **Description of Plot:** See AFN 22:714-715 (1968). **Coverage:** June 2, 4-5, 9-11, 15-16, 18, 21, 25; July 2, 6, 12, 15-16, 30; 0500-1215 or 1355-1750, EDT. **Total man-hours:** 27. **Census:** Wood Thrush, 17 (120, 49); Ovenbird, 12 (85, 34); Rufous-sided Towhee, 7 (49, 20); Am. Robin, 5 (35, 14); Blue Jay, 4 (28, 11), Tufted Titmouse, 4; Veery, 4; Red-eyed Vireo, 4; Cardinal, 4; Rose-breasted Grosbeak, 4, Com. Flicker 3 (21, 9); Gray Catbird, 3; Com. Yellowthroat, 3; N. Oriole, 3; E. Wood Pewee, 2; White-breasted Nuthatch, 2; Black-and-white Warbler, 2; Scarlet Tanager, 2; Downy Woodpecker, 1; E. Phoebe, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; House Wren, 1; Indigo Bunting, 1; Mourning Dove, 0.5; Hairy Woodpecker, +. **Total:** 26 species, 91.5 territorial males (646/km², 261/100 acres). **Visitors:** Red-tailed Hawk, Chimney Swift, Com. Crow, Starling, Blue-winged Warbler, House Sparrow. **Remarks:** In the span 1973-78, Wood Thrush numbered 13, 8, 14, 7.5, 15, 17; Red-eyed Vireo, 13, 11, 10, 8, 7, 4, Rufous-sided Towhee, 12, 14, 10, 8.5, 12, 7. **Total territorial males dropped from 125.5 in 1977 to 91.5 in 1978.** — **LAURA H. MOSELEY**, 1083 Hillsboro Beach, Pompano Beach, Fla. 33062.

67. UPLAND BRUSHY PASTURE. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°42'N, 73°13'28"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 12 intermittent years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AFN 19:609-610 (1965). **Coverage:** Apr. 30; May 23; June 4-5, 10-11. **Total man-hours:** 18. **Census:** Gray Catbird 16 (188, 76), Com. Yellowthroat, 11 (129, 52); Blue-winged Warbler, 10 (118, 48); Rufous-sided Towhee, 8 (94, 38); Red-eyed Vireo, 6 (71, 29); Song Sparrow, 5 (59, 24); Am. Woodcock, 4 (47, 19); Cedar Waxwing, 4; Am. Goldfinch, 4, Field Sparrow, 4; Wood Thrush, 3.5 (41, 17), Blue Jay, 3 (35, 14); Am. Robin, 3; Black-and-white Warbler, 3; Am. Redstart, 3; Veery, 2, 5, Ruffed Grouse, 2; Brown Thrasher, 2; Ovenbird, 2; Brown-headed Cowbird, 2; Rose-breasted Grosbeak, 2; Mourning Dove, 1, Yellow-billed Cuckoo, 1; Com. Flicker, 1, Black-capped Chickadee, 1; Nashville Warbler, 1; Yellow Warbler, 1; Chestnut-sided Warbler, 1; Yellow-breasted Chat, 1; N Oriole, 1; Cardinal, 1; Purple Finch, 1; E Kingbird, 0.5; Great Crested Flycatcher, 0, 5, Broad-winged Hawk, +; Great Horned Owl, +. **Total:** 36 species; 112 territorial males (1318/km², 533/100 acres). **Remarks:** This plot continues to undergo rapid change in its succession to hardwood forest. Density rose

slightly from 1977 to reach a new peak. Gray Catbird at 16 is at an all-time species high. Prairie Warbler, at 8 in 1965, has finally disappeared. The Yellow-breasted Chat is new. Thanks to Jim Cavanaugh. — **ANDREW MAGEE**. 34 Hobson St., Springfield, Mass. 01109.

68. ABANDONED PASTURE – YOUNG MIXED FOREST. — **Location:** New York; St. Lawrence Co., 0.25 mi E of Howardville Rd, 0.25 mi SW of Rt. 68; 44°33'N, 75°03'W, Pierpont Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 3.44 ha = 8.5 acres. **Description of Plot:** See *AB* 32:74 (1978). **Weather:** May cool, June and early July warm and dry. **Coverages:** May 23, 26; July 11; 0500-1715 EST. Total man-hours: 4. **Census:** Nashville Warbler, 3 (87, 35); Gray Catbird, 2; Veery, 2; Rufous-sided Towhee, 2; Field Sparrow, 2; Ruffed Grouse, 1; E. Kingbird, 1; Black-capped Chickadee, 1; Black-and-white Warbler, 1; Chestnut-sided Warbler, 1; Chipping Sparrow, 1; White-throated Sparrow, 1; Song Sparrow, 1; Com. Yellowthroat, +; N. Oriole, +; Brown-headed Cowbird, +; Rose-breasted Grosbeak, +. **Total:** 17 species; 19 territorial males (522/km², 224/100 acres). **Remarks:** Nashville Warbler may not breed. Alder Flycatcher and Com. Snipe in adjacent edge. Nests of kingbird and Field Sparrow found; latter contained 3 eggs plus 1 cowbird egg. — **KENNETH L. CROWELL**, Dept. of Biology, St. Lawrence Univ., Canton, N.Y. 13617.

69. TRANSMISSION LINE RIGHT-OF-WAY. — **Location:** New York; Rensselaer Co., North Greenbush, E of the Reynolds Rd Substation; E edge 42°39'32"N, 73°39'29"W; W edge 42°41'18"N, 73°41'10"W; Troy S Quadrangle, USGS. **Continuity:** New. **Size:** 7.1 ha = 17.6 acres (rectangular, 150 × 8700 ft, calculated from construction drawings; a section of the plot, 150 × 3600 ft, was not censused owing to an active farm and adjoining wetland). **Description of Plot:** This right-of-way was originally cleared in 1939 and widened from 100 ft to 150 ft in 1976. In 1976 all undesirable vegetation over 8 ft was cut and stump treated with herbicides and smaller, tall growing species were foliar treated with Tordon 101. Two roads and two small streams less than a yard wide cross the plot. A maintenance road is located along most of the right-of-way. Approximate percent ground cover values for the major vegetation categories follows: mosses 5, ferns 5, grasses 20, forbs 30, shrubs 20, and trees 20. The dominant plant species noted were White Ash (*Fraxinus americana*), Gray Birch (*Betula populifolia*), Pin Cherry (*Prunus pensylvanica*), Red Maple (*Acer rubrum*), Quaking Aspen (*Populus tremuloides*), White Pine (*Pinus strobus*), Smooth Sumac (*Rhus glabra*), Staghorn Sumac (*R. typhina*), juneberry (*Amelanchier* sp.), Gray Dogwood (*Cornus racemosa*), Arrow-wood (*Viburnum dentatum*), Black Raspberry (*Rubus occidentalis*), N. Dewberry (*R. flagellaris*), Red Raspberry (*R. ideaus*), Virginia Creeper (*Parthenocissus quinquefolia*), goldenrod (*Solidago* spp.), milkweed (*Asclepias* spp.), daisy (*Aster* spp.), knapweed (*Centaurea* spp.), sedges (*Carex* spp.), blue grass (*Poa* spp.), bluestem (*Andro-*

pogon spp.), foxtail (*Setaria* spp.), Sensitive Fern (*Onoclea sensibilis*), Bracken (*Pteridium aquilinum*), and Haircap Moss (*Polytrichum commune*). **Edge:** The sides of the right-of-way at the E and W ends are bordered by upland hardwood forest and second-growth woods. The edges along the middle are abandoned fields and several residences. **Topography:** Slopes from 350 to 550 ft, W-E. The right-of-way crosses the side slopes of several hills and intervening depressions. **Weather:** Average temperature, 64°; 4° below normal. Precipitation, 4.6 in., 1.6 in. above normal, with numerous thunderstorms in the afternoons and evenings. **Coverage:** June 2, 5-6, 8, 14, 16; 0515-0815. Total man-hours: 14. **Census:** Com. Yellowthroat, 8 (112, 45); Song Sparrow, 6 (84, 34); Gray Catbird, 4 (56, 23); Rufous-sided Towhee, 4; Blue-winged Warbler, 2; Field Sparrow, 2; Indigo Bunting, 2; E. Kingbird, 1; Brown Thrasher, 1; Am. Robin, 1; Brown-headed Cowbird, 1; Cardinal, 1; Great Crested Flycatcher, 0.5; House Wren, 0.5; Red-winged Blackbird, 0.5; Yellow Warbler, +; Chestnut-sided Warbler, +; Am. Goldfinch, +. **Total:** 18 species; 34.5 territorial males (484/km², 196/100 acres). **Visitors:** Killdeer, Mourning Dove, Com. Flicker, Black-capped Chickadee, Veery, Starling, Bobolink, E. Meadowlark, N. Oriole. **Remarks:** The Indigo Buntings appeared to have the largest linear territories. Downy Woodpeckers, Common Crows, Blue Jays, White-breasted Nuthatches, Red-eyed Vireos, and Black-and-white Warblers were often heard farther into the adjacent forests than at the edge or were seen passing over the right-of-way. — **JAMES J. DE WAAL MALEFYT**, Office of Environmental Planning, Dept. of Public Service, Empire State Plaza, Albany, N.Y. 12223.

70. DECIDUOUS FOREST WITH POND AND BROOK. — **Location:** New Jersey; Bergen Co. Mahwah Campgaw Mountain Reservation. **Continuity:** Established 1964; 15 consecutive years. **Size:** approximately 16.2 ha = 40 acres. **Description of Plot:** See *AFN* 19: 623-624 (1965). **Coverage:** May 23, 25, 30; June 1, 6, 8, 13, 15, 20; 0530-0645. Total party-hours: 11. **Census:** Gray Catbird, 3 (19, 8); Wood Thrush, 3; Starling, 3; Com. Flicker, 2; Tree Swallow, 2; Tufted Titmouse, 2; Veery, 2; Yellow Warbler, 2; Song Sparrow, 2; Yellow-billed Cuckoo, 1; Downy Woodpecker, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; House Wren, 1; Am. Robin, 1; Yellow-throated Vireo, 1; Red-eyed Vireo, 1; Blue-winged Warbler, 1; Chestnut-sided Warbler, 1; Ovenbird, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Scarlet Tanager, 1; Cardinal, 1. **Total:** 29 species; 41 territorial males (253/km², 103/100 acres). — **J. and N. BRISTOW**, **T. DYE**, **L. GAITSKILL**, **J. MOFFAT**, **K. SJOLANDER**, **J. WHITE**, **J. WORRALL** and **J. BROTHERTON** (compiler), *Fyke Nature Assoc.*, 249 E. Crescent Ave., Mahwah, N.Y. 07430.

71. BRUSHY FIELD AND WOODED EDGE. — **Location:** Pennsylvania; Cumberland Co., 1 mi NE of Carlisle, 0.3 mi NNW of U.S. Rte 11, off Cavalry Rd on National

Guard property; 40 12'N, 77 10'W, Carlisle Quadrangle, USGS. **Continuity:** New. **Size:** 7.54 ha = 18.62 acres (roughly rectangular, approximately 210 × 359 m, paced). **Description of ot:** The area consists of a field with mixed ground cover, bushes, and young trees, with a more heavily wooded area on the SW side, where trees average approximately 20 m in height. Frequently-used dirt motorbike trails wind through the field. Approximately 15% of the vegetation is tall trees, 25% shrubs and small trees, 60% ground cover. The dominant taller trees are Black Locust (*Robinia pseudoacacia*) and Slippery Elm (*Ulmus rubra*). Smaller trees and shrubs are mainly Staghorn Sumac (*Rhus typhina*), Red Mulberry (*Morus rubra*), and Fly Honeysuckle (*Lonicera oblongifolia*). The wide variety of ground cover consists of the following (in order of abundance): Canada Goldenrod (*Solidago canadensis*), Daisy Fleabane (*Erigeron annuus*), Wild Carrot (*Daucus carota*), Ox-eye Daisy (*Chrysanthemum leucanthemum*), Willow Aster (*Aster praecaltus*), Com. Ragweed (*Ambrosia artemisiifolia*), Timothy (*Phleum pratense*), Red Clover (*Trifolium pratense*),



Census 71. Brushy Field and Wooded Edge. Photo/B. F. Rollfinke.

Smaller Hop Clover (*T. procumbens*), Yarrow (*Achillea millefolium*), Spotted Knapweed (*Centaurea maculosa*), and Tall Thistle (*Cirsium altissimum*). **Edge:** Bordered on the W and N by mowed grass fields with several large buildings; on NE by Cavalry Rd (a large cornfield is on the opposite side of Cavalry Rd). Suburban residential areas border the SE side. **Topography:** Gently rolling, downhill from NW to SE. **Elevation:** 490 ft. **Weather:** Average temperatures for area (50-90°F) with normal precipitation. **Coverage:** May 13, 20, 28; June 3-4, 11, 14, 16, 22, 30; 0530-0945. Total man-hours: 28.5. **Census:** Gray Catbird, 8 (106, 43); Am. Robin, 6.5 (86, 35); Song Sparrow, 4.5 (60, 24); Field Sparrow, 4 (53, 21); Com. Yellowthroat, 3 (40, 16); Cardinal, 3; House Wren, 2; Brown-headed Cowbird, 2 (females); Am. Goldfinch, 2; Black-billed Cuckoo, 1; Com. Flicker, 1; Willow Flycatcher, 1; Blue Jay, 1; Brown Thrasher, 1; Yellow Warbler, 1; Red-winged Blackbird, 1; N. Oriole, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1; Ring-necked Pheasant, 0.5; Com. Crow, 0.5; Starling, +; Com. Grackle, +. **Total:** 23 species; 46 territorial males or

females (610/km², 247/100 acres). **Visitors:** Am. Kestrel, Rock Dove, Mourning Dove, Com. Nighthawk, Chimney Swift, Barn Swallow, Mockingbird, Swainson's Thrush, Veery, Cedar Waxwing, Magnolia Warbler, Black-throated Green Warbler, Chestnut-sided Warbler, Bay-breasted Warbler, Blackpoll Warbler, Wilson's Warbler, Canada Warbler, Am. Redstart, House Sparrow, House Finch, White-throated Sparrow. **Remarks:** No nests were found but Cardinal and Com. Grackle fledglings were seen out of nest with adults. Presence of Tent Caterpillars supplied a good source of food for cuckoos. Special thanks to Paul Biebel and Carl Strang for their guidance. — *BRIAN F. ROLLFINKE, 1013 Harriet St., Carlisle, Pa. 17013.*

72. MOUNTAIN TOP BOG WITH MIXED HARDWOOD AND EVERGREEN EDGE.

— **Location:** Pennsylvania; Westmoreland Co., 10 mi SSW of Ligonier, 6 mi S of Laughlontown in Forbes State Forest on the top of Laurel Mountain; 40°07'20"N, 79°10'28"W, Bakersville Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28:1027 (1974). **Weather:** Sunny, except for one rainy day; mostly warm and clear, light wind. **Coverage:** June 3-4, 6-7, 10-11; 0500-0930; 1200-1300 and 1700-1930. Total party-hours: 8. **Census:** Chipping Sparrow, 5 (82, 33); Solitary Vireo, 4.5 (74, 30); Rufous-sided Towhee, 3 (49, 20); Dark-eyed Junco, 3; Scarlet Tanager, 2.5; Com. Yellowthroat, 2; Black-capped Chickadee, 1.5; Am. Robin, 1.5; Red-eyed Vireo, 1.5; Hermit Thrush, 1; Magnolia Warbler, 1; Indigo Bunting, 1; Tufted Titmouse, 0.5; Gray Catbird, 0.5; Canada Warbler, 0.5; Turkey Vulture, +; Goshawk, +; Red-shouldered Hawk, +; Blue Jay, +; Com. Crow, +; Cedar Waxwing, +; Com. Grackle, +. **Total:** 22 species; 29 territorial males (478/km², 193/100 acres). **Visitors:** Cooper's Hawk, Barn Swallow, Blackburnian Warbler, Purple Finch, Am. Goldfinch. — *R. CARRELL ABBOTT (compiler), Audubon Society of Western Pennsylvania, Pittsburgh, Pa.*

73. MIXED UPLAND HABITAT. — **Location:** Pennsylvania; Montgomery Co., woods of St. Charles Seminary, 0.4 mi SW of Philadelphia city limits on US 30; 40°00'N, 75°15'W, Lansdowne Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 7.77 ha = 19.2 acres. **Description of Plot:** See AB 32:74-75 (1978). **Weather:** Normal temperatures (45-85°F) and precipitation. **Coverage:** Apr. 16, 23, 30; May 6-7, 15, 21, 23, 27-28, 31; June 4, 11, 18, 24-25; July 2, 17; 18 trips, mostly 0630-1100, occasionally 1300-1830. Total man-hours: 22. **Census:** Gray Catbird, 15 (193, 78); Am. Robin, 10.5 (135, 55); Cardinal, 8.5 (109, 44); Com. Yellowthroat, 7 (90, 36); Song Sparrow, 7; Wood Thrush, 6 (77, 31); Starling, 5 (64, 26); Ring-necked Pheasant, 4 (51, 21); House Wren, 4; Am. Goldfinch, 4; Mourning Dove, 3 (39, 16); Blue Jay, 3; Red-eyed Vireo, 3; Brown-headed Cowbird, 3; Com. Flicker, 2; Carolina Chickadee, 2; Rufous-sided Towhee, 2; Mockingbird, 1.5; Mallard, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; Com. Crow, 1; Tufted Titmouse, 1; White-eyed Vireo, 1; Ovenbird, 1; Am. Redstart, 1; Com. Grackle, 1; Indigo Bunting, 1. **Total:** 28 species; 100.5 territorial



Census 73. Mixed Upland Habitat. Photo / D. M. Wright.

males or females (1293/km², 523/100 acres). **Visitors:** Broad-winged Hawk, Am. Kestrel, Red-bellied Woodpecker, Hairy Woodpecker. **Remarks:** Fourteen active nests were located: Starling, 5; Com. Flicker, 2; Gray Catbird, 2; Blue Jay, 1; Am. Robin, 1; Wood Thrush, 1; White-eyed Vireo, 1; Song Sparrow, 1. One 40 ft-tall dead tree was utilized by 5 pairs of hole-nesting birds (3 Starling and 2 Com. Flicker) all nesting within 20 ft of each other. — *DAVID M. WRIGHT, 527 Rock Glen Dr., Wynnwood, Pa. 19096.*

74. 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; 40°44'N, 79°42'W, Freeport Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** Divided into two distinct areas; a relatively open shrubby area of approximately 5 acres and a 20 acre thicket. Located in the NW corner is a pond of approximately 0.5 acres. The dominant shrubby species in the open area is huckleberry (*Gaylussacia* spp.); and goldenrod (*Solidago* spp.) is the most prominent ground cover. Dominant canopy species in the thicket include crabapple (*Pyrus* spp.) and Red Maple (*Acer rubrum*). Most evident in the understory are Black Cherry (*Prunus serotina*) and Red Maple. The most prominent ground cover is *Lycopodium*. A quantitative study of the entire plot gave the following results: Trees 3-in. diameter and over based on 6 circular samples, 93/acre; total basal area 15.4 ft²/acre. Species composing 90% of the total number of trees: Crabapple, 56, 61, 38, 100; Red Maple, 22, 24, 38, 50; Black Cherry, 5, 5, 5, 33. Trees by diameter size class: A (3-6 in.) 70, 76, 7.0, 46; B (6-9 in.) 19, 21, 58, 37; C (9-15 in.) 3, 3, 2.6, 17. Shrub stems/acre 110,000; ground cover 64%; canopy cover 56%; average canopy height 23 ft (range 15-50). **Edge:** Bordered primarily by climax oak-hickory forest, but in sections by crabapple thicket or farm fields. **Topography:** Essentially flat.

Elevation: 1040 ft. **Weather:** Cool with an unusually wet summer. **Coverage:** June 6-7, 9, 11-14, 17, 19, 25; July 12; August 20, 23, 28, 30; between dawn and 0930 or 1800-2000. Total man-hours: 23. **Census:** Field Sparrow, 5 (49, 20); Indigo Bunting, 4 (40, 16); Com. Yellowthroat, 3 (30, 12); Rufous-sided Towhee, 3; Red-eyed Vireo, 2.5; Black-capped Chickadee, 2; House Wren, 2; Cardinal, 2; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Gray Catbird, 1; Wood Thrush, 1; Cedar Waxwing, 1; Blue-winged Warbler, 1; Brewster's Warbler, 1; Hooded Warbler, 1; Scarlet Tanager, 1; Am. Goldfinch, 1; Song Sparrow, 1; Brown-headed Cowbird, 0.5; Tufted Titmouse, +; Kentucky Warbler, +. **Total:** 22 species; 35 territorial males or females (346/km², 140/100 acres). **Visitors:** Mallard, Belted Kingfisher, Great Crested Flycatcher, Blue Jay, Com. Crow, Blue-gray Gnatcatcher, Yellow-throated Vireo, Prairie Warbler, Ovenbird, Com. Grackle, Chipping Sparrow. **Remarks:** 6 nests were located: 1 House Wren; 1 Indigo Bunting; 3 Field Sparrow. Notable decrease in Rufous-sided Towhee, 7.5 to 3, since 1976. This was the first year that the Song Sparrow has bred, possibly due to burning in the spring of 1977. Special thanks to Rupert Friday and Todd Wessel for their help with the quantitative habitat description. — *TIMOTHY L. SCHUMANN, 110 Roberts Dr., Clairton, Pa. 15025.*

75. BIRCH - OAK SAVANNAH AND WETLAND.

— **Location:** Ontario; Haldimand-Norfolk Regional Municipality, Port Rowan, 5.9 mi W of the Long Point Lighthouse; 42°32'N 80°07'W, Little Creek Ridges, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** New. **Size:** 5.85 ha = 14.46 acres (laid out in 0.52 acre squares with compass and measured rope, rectangular, 100 × 700 yds). **Description of Plot:** Includes a rolling dune ridge running the length of the N edge (elevation at crest 585 ft) and a wetland basin (elevation 565). Bordered (long axis E-W) on the S by another dune ridge. There is very little human disturbance, however signs of a fire which occurred 15 years ago are evident. The dominant canopy trees are White Birch (*Betula papyrifera*), Red Oak (*Quercus rubra*), *Sassafras albidum*, and Silver Maple (*Acer saccharinum*). The majority of the plot is grassland savannah with very few shrubs or young trees. Buttonbush (*Cephalanthus occidentalis*) is found principally in small seasonal wetland areas of the S margin. Ground cover is composed primarily of grasses. Ground cover was analyzed using 12 transects each of .01 acre: A total of 120 ocular tube sightings were taken and species of plants in each sighting noted. Dominant species (figures after each give relative dominance (%) and frequency of occurrence (%) in 12 transects): Canada Blue Grass (*Poa compressa*), 26, 83; Blue-joint Grass (*Calamagrostis canadensis*), 16, 83; Marsh Fern, (*Thelypteris palustris*), 16, 67; Kentucky Blue Grass (*P. pratensis*), 11, 83; Bracken (*Pteridium aquilinum*), 8, 67; Com. Milkweed (*Asclepias syriaca*), 8, 83; Sedge (*Carex stricta*), 6, 50; False Nettle (*Boehmeria cylindrica*), 3, 50; goldenrod (*Solidago* sp.), 2, 17; Rice Grass (*Oryzopsis racemosa*), 2, 50; Nightshade (*Solanum nigrum*). Also present was Sedge (*Carex capitata* and *comosa*), Goatsbeard (*Tragopogon*

pratensis), Grape (*Vitis riparia*), Prickly Wild Lettuce (*Galium scariola*), bur-reed (*Spartanium* sp.), and Ground Cherry (*Physalis subglabrata*). A quantitative vegetation survey following the method prescribed by James and Shugart gave the following results: Trees 3 in. diameter and over, based on six 0.1 acre circular samples, 109/acre, total basal area 110 ft²/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): Dead trees, 42, 39, 28, 83; White Birch, 35, 32, 23, 83; Red Oak, 13, 12, 21, 50; Sassafras, 5, 5, 2, 33; Silver Maple, 3, 3, 7, 33; White Ash (*Fraxinus americana*), 3, 3, 7, 17; Hop Hornbeam (*Ostrya virginiana*), 3, 3, 2, 17; Red Maple (*A. rubrum*), 2, 2, 7, 50; and Yellow Oak (*Q. bicolor*), 2, 1, 1, 17. Also present are Red Ash (*F. pennsylvanica*), Black Cherry (*Prunus serotina*), White Pine (*Pinus strobus*), and White Cedar (*Thuja occidentalis*). Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance (%): A (3-6 in.) 0; B (6-9 in.) 27, 25, 8, 7; C (9-15 in.) 62, 58, 50, 46; D (15-21 in.) 10, 9, 17, 16; E (21-27 in.) 3, 3, 10, 9; F (27-33 in.) 5, 5, 24, 22. Shrub stems/acre: 42; ground cover 94%; canopy cover 41%; average canopy height 50 ft (range 35-60 ft). **Edge:** The S and W are bordered by tracts of similar forest habitat; the E is comparable for ¼ mi before meeting burned over grassland; the N boundary is 150 yds from the marshland border of Lake Erie. **Elevation:** 565-585 ft. **Topography:** Sand dunes form irregular ridges running in an E-W direction. Two such ridges form rough outer boundaries of the plot. **Weather:** Generally warm (13-24°C) with little or no wind. Overcast 50%; no rain. **Coverage:** May 25; June 1, 5-6, 16, 21, 29; July 1, 6; 0545-1130 and 1830-2045. Total man-hours: 63. Total group-hours: 31. **Census:** Tree Swallow, 15 (256, 104); N. Oriole, 7 (120, 48); House Wren, 6 (103, 41); Red-winged Blackbird, 6; Com. Flicker, 5 (85, 35); E. Wood Pewee, 5; Com. Yellowthroat, 5; Great Crested Flycatcher, 4 (68, 28); Gray Catbird, 3.5 (60, 24); Red-eyed Vireo, 3 (51, 21); Yellow-billed Cuckoo, 2.5; Com. Grackle, 2.5; E. Kingbird, 2; Starling, 2; Mallard, 1; Red-headed Woodpecker, 1; Brown-headed Cowbird, 1; Blue-gray Gnatcatcher, 0.5; Yellow Warbler, 0.5; Whip-poor-will, +. **Total:** 20 species; 72.5 territorial males (1239/km², 501/100 acres). **Remarks:** 32 nests were located: Tree Swallow, 13; Com. Flicker, 5; N. Oriole, 4; Red-winged Blackbird, 3; Mallard, 1; Red-headed Woodpecker, 1; E. Kingbird, 1; House Wren, 1; Gray Catbird, 1; Red-eyed Vireo, 1; Com. Grackle, 1. The Red-eyed Vireo nest contained 6 cowbird eggs, which were subsequently predated along with the 2 vireo eggs. Unusual visitors included Turkey Vulture and an immature Bald Eagle. Dead trees (predominantly White Birch) in various stages of decomposition play an important role in suitability of this area for nesting, as they afford cavities for a large number of Tree Swallows, flickers and other species. Special thanks to Bruce Ralph and Sue Heffernan for assistance with vegetation analysis. — RICK HURST (compiler), LIZ GIBB, JARMO JALAVA, JON McCracken, JAMES TASKER, GREG WAGNER, Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ont. N0E 1M0, Can.

76. DUNE GRASS - COTTONWOOD BEACH. — **Location:** Ontario; Haldimand-Norfolk Regional Municipality, Port Rowan, 3.2 mi W of the Long Point Lighthouse; 42° 32' N, 80° 07' W; Gravelly Bay, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** Established 1974; 2 intermittent years. **Size:** 12.1 ha = 30 acres. **Description of Plot:** See AB 28:1023-4 (1974). **Weather:** Generally clear and warm (16-25°C), winds light (0-10 knots). **Coverage:** May 29; June 3, 10, 13, 20; July 2, 7, 9; 0500-0900 and 1830-2000, EST. Total man-hours: 20.5. **Census:** Spotted Sandpiper, 1.5; Killdeer, 0.5; E. Kingbird, 0.5; Red-winged Blackbird, 0.5. **Total:** 4 species; 3 territorial males (25/km², 10/100 acres). **Remarks:** One Spotted Sandpiper nest was found. As indicated in the first year of study, this area is used primarily as a feeding ground. The beach offers decaying fish, which are utilized by gulls and grackles. Starlings, grackles, Red-winged Blackbirds and N. Orioles were observed feeding on insects among the cottonwoods. Tree, Barn and Bank Swallows frequently fed over the grid. Canada Geese, Mallards, and Blue-winged Teal were observed regularly in the shallow dune pond adjacent to the N boundary, and occasionally utilized the plot as a loafing site. Flocks of second and third year non-breeding Ring-billed Gulls would often congregate at the lake edge in groups of several hundred. Special thanks to Michael Bradstreet. — RICK HURST (compiler), JARMO JALAVA and JAMES TASKER, Long Point Bird Observatory, Port Rowan, Ont. N0E 1M0.

77. INTERDUNAL MEADOW. — **Location:** Ontario; Lambton Co., Bosanquet Township, Pinery Provincial Park; about 3 km SW of Grand Bend; 43° 17' N, 81° 48' W; Grand Bend 40 P/5; Grid Reference 427349. **Continuity:** New. **Size:** 6.1 ha = 15.1 acres (rectangular, 296 × 2220 ft; surveyed into half-acre squares). **Description of Plot:** Open interdunal meadow with some scattered clumps of trees (Red Pine (*Pinus resinosa*); Red Cedar (*Juniperus virginiana*); White Pine (*P. strobus*); Black Oak (*Quercus velutina*) and extensive patches of low-lying shrubs - Fragrant Sumac (*Rhus aromatica*) and Com. Juniper (*J. communis*); with smaller amounts of Soapberry (*Shepherdia canadensis*) and Choke Cherry (*Prunus virginiana*). Dominant plant cover in most open places is Bearberry (*Arctostaphylos uva-ursi*); Sand Reed (*Calamovilfa longifolia*); Blue Stem Grass (*Andropogon scoparius*); Turkey-foot Grass (*A. gerardi*); and False Solomon's Seal (*Smilacina racemosa*). A nature trail and boardwalk run through a section of the plot. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on eight 0.1 acre circular samples, 94 trees/acre; total basal area 23.1 ft²/acre. Species comprising 90% of the total number of trees (figures after each species give the number of trees per acre, relative density (%), relative dominance (%), frequency, in that sequence): Red Cedar, 48, 51, 32, 87.5; Red Pine, 19, 26, 31, 62.5; White Pine, 7, 10, 7, 62.5; Black Oak, 9, 13, 30, 50. Trees by diameter size class (figures give number of trees per acre, relative dominance (%), basal area in square feet per acre, and relative dominance (%): A (3-6 in.) 51, 54, 5.1, 21; B (6-9 in.) 27, 29, 8.1, 34; C (9-15 in.) 13, 15, 10.4, 43; D (15-21 in.) 0.1, 1, 0.2, 1;

E (21-27 in.) 0.1, 1, 0.2, 1. Shrub stems per acre 94,438; ground cover 74%; canopy cover 20%; average canopy height 23 ft (range 15-40 ft). **Edge:** The NW side is surrounded by the shoreline of Lake Huron. A mature open pine-oak forest complex borders the SE side. Similar open interdunal areas are found on the remaining two sides. However, adjacent to the SW side a picnic area and parking lot have been developed. **Topography:** Two dunes run longitudinally through the plot. One, bordering the NW side, rises some 5 m from the beach and 2 m from the inland plot. The second dune runs through the middle of the plot rising to a height of 8 m. The area between these dunes is generally flat and low-lying. **Elevation:** 600 ft (180 m). **Weather:** Most days were clear, hot and sunny. Temperatures 60-90°F, with average daytime temperature around 75°F. Winds were light or negligible. June and July had near drought conditions with 2/3 normal rainfall recorded. **Coverage:** June 4, 10-11, 20, 25, 28; July 9; 0545-0845 or 1910-2215, EDT. Total man-hours: 41. **Census:** Field Sparrow, 9 (147, 60); Rufous-sided Towhee, 7 (115, 46); Blue Jay, 6 (98, 40); Cedar Waxwing, 4 (65, 26); Brown-headed Cowbird, 4; Gray Catbird, 3 (49, 20); Am. Robin, 3; Prairie Warbler, 3; Chipping Sparrow, 3; Magnolia Warbler, 2.5; Am. Woodcock, 2; Mourning Dove, 2; Black-capped Chickadee, 2; Brown Thrasher, 2; N. Oriole, 2; Cardinal, 2; Black-billed Cuckoo, 1; Com. Nighthawk, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Great Horned Owl, +; Com. Crow, +. **Total:** 22 species; 60.5 territorial males and non-territorial females (990/km², 401/100 acres). **Visitors:** Com. Flicker, Rough-winged Swallow, Com. Yellowthroat, Rose-breasted Grosbeak, Purple Finch, Pine Siskin, Song Sparrow. **Remarks:** Ten nests were located: Great Crested Flycatcher, Black-capped Chickadee, Brown Thrasher (2), Am. Robin (2), Cedar Waxwing, Rufous-sided Towhee, Field Sparrow (2). In addition, breeding evidence was found for catbird and Com. Crow. Rough-winged Swallow and Blue Jay had nests just outside the plot. Gratitude is extended to the Ontario Ministry of Natural Resources and the staff of Pinery Provincial Park for their assistance and support in this project. Special thanks to Terry Crabe and William Vandenbygaert for their assistance in the vegetation analysis. — CHRISTOPHER G. HARRIS, 11 Letitia Street, Barrie, Ont. L4N 1N7, Can.



Census 77. Interdunal Meadow. Photo/C. G. Harris.

78. ASPEN CLEARCUT (8-Year). —

Location: Minnesota, Itasca Co., Chippewa National Forest, NE-¼, Sec. 9 Jessie Lake Quadrangle, USGS, T58N, R25W. **Continuity:** New. **Size:** 10.52 ha = 26.0 acres. **Description of Plot:** Clearcut in 1970; now average height 15 ft (12-18) with Aspen (*Populus tremuloides*) the dominant species. Balsam Poplar (*P. balsamifera*) occurred in wet places. Understory species include raspberry (*Rubus* spp.), Bracken (*Pteridium aquilinum*), Am. Hazel (*Corylus americana*), Beaked Hazel (*C. cornuta*), Round-leaf Dogwood (*Cornus rugosa*) and honeysuckles (*Lonicera* spp.). **Edge:** Bordered on the N by similar vegetation. The W, S and E borders are aspen-birch woods with scattered ash. **Topography:** Flat. **Elevation:** 1375 ft. **Coverage:** May 22; June 5, 15, 22-23, 29; 0530-0930 hours. Total man-hours: 245. **Census:** Chestnut-sided Warbler, 17 (162, 65); White-throated Sparrow, 4.5 (43, 17), Mourning Warbler, 4 (38, 15); Golden-winged Warbler, 3.5 (33, 13); Nashville Warbler, 2; Com. Yellowthroat, 2; Rose-breasted Grosbeak, 2; Veery, 1.5; Am. Goldfinch, 1.5; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Gray Catbird, 1; Red-eyed Vireo, 1; Song Sparrow, 1; Com. Flicker, 0.5; Am. Redstart, 0.5; Turkey Vulture, +; Broad-winged Hawk, +; Bald Eagle, +; Osprey, +; Ruby-throated Hummingbird, +; Yellow-bellied Sapsucker, +; Black-capped Chickadee, +; Brown-headed Cowbird, +. **Total:** 25 species; 45 territorial males (428/km², 173/100 acres). — DONALD RAKSTAD and JOHN R. PROBST, North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.

79. MIXED WETLAND WITH TAMARACK AND ASPEN GROVES, SHRUBLAND AND FEN. —

Location: Wisconsin; Waukesha Co., Falk Woods Nature Conservancy Area, 3 mi S of Waukesha, 2.5 mi S of intersection of County Highways A and F; 42° 56'N, 88°14'W, Muskego Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 16.9 ha = 41.7 acres. **Description of Plot:** See AB 32:79-80 (1978). **Weather:** temperatures; above average rainfall. **Coverage:** May 29; June 6, 9, 11, 20, 22; July 4, 6; 0530-1030. Total man-hours: 20. **Census:** Red-winged Blackbird, 13 (77, 31); Com. Yellowthroat, 9 (53, 22); Yellow Warbler, 8 (47, 19); Gray Catbird, 7 (41, 17); Song Sparrow, 6 (36, 14); Veery, 5 (30, 12); Am. Goldfinch, 4.5 (27, 11); Swamp Sparrow, 4.5, Cedar Waxwing, 3.5 (21, 8); Willow Flycatcher, 3 (18, 7); House Wren, 3; Black-capped Chickadee, 2.5; Am. Robin, 2.5; Mourning Dove, 2; Alder Flycatcher, 2; Least Flycatcher, 2; Red-eyed Vireo, 2; Brown-headed Cowbird (female), 2; Rufous-sided Towhee, 2; Rose-breasted Grosbeak, 1.5; Indigo Bunting, 1.5; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Downy Woodpecker, 1; Blue Jay, 1; Wood Thrush, 1; Blue-winged Warbler, 1; N. Oriole, 1; Scarlet Tanager, 1; Cardinal, 1; Red-headed Woodpecker, 0.5; Hairy Woodpecker, 0.5; Great Crested Flycatcher, 0.5, E. Wood Pewee, 0.5; Ring-necked Pheasant, +; Com. Crow, +; Golden-winged Warbler, +; Mourning Warbler, +; Com. Grackle, +. **Total:** 39 species; 97.5 territorial males or females (578/km², 234/100 acres). **Visitors:** Red-tailed Hawk, Virginia Rail, Black-billed Cuckoo, Ruby-throated Hummingbird, Barn

Swallow, Tufted Titmouse, Canada Warbler, Field Sparrow. **Remarks:** Nest located. Com. Flicker. — BOB ADAMS, JOHN BIELEFELDT, DON HAGAR, HARRY LEEMAN, VERN AUNE (compiler), Benjamin F. Goss Bird Club, S. 13 W22167 Ridge Road, Waukesha, Wis. 53186.

80. ASPEN CLEARCUT (2-YEAR). —

Location: Michigan; Ontonagon Co., NW¼, Sec. 8, T49N, R39W. **Continuity:** New. **Size:** 13.9 ha = 34.3 acres. **Description of Plot:** Aspen (*Populus tremuloides*) and *P. grandidentata* are the major tree species. Avg. ht = 4 ft (1-7.5). Scattered residuals of Aspen, Red Maple (*Acer rubrum*) and Black Spruce (*Picea mariana*) are also present. The most dominant ground cover is Large-leaved Aster (*Aster macrophyllus*), Wild Strawberry (*Fragaria virginiana*), sedge (*Cyperaceae*), various grasses and ferns. Logging roads are still void of vegetation. There are two small wet areas which had standing water throughout the period. **Edge:** Bordered on the N by similar vegetation. All other sides by mature aspen-maple woodland. **Topography:** Gradually sloping SE. **Coverage:** May 31; June 3-4, 6, 8, 10, 21, 26, 30; between 0530-1200. Total man-hours: 22.75. **Census:** Song Sparrow, 22 (158, 64); Brown-headed Cowbird, 12 (86, 35); Mourning Warbler, 6 (43, 17); White-throated Sparrow, 5 (36, 15); Killdeer, 3 (22, 9); E. Kingbird, 3; Red-winged Blackbird, 3; Tree Swallow, 2; Indigo Bunting, 2; Am. Woodcock, 1; Com. Snipe, 1; Spotted Sandpiper, 1; Com. Flicker, 1; Least Flycatcher, 1; House Wren, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; N. Oriole, 1; Am. Goldfinch, 1; Sharpshinned Hawk, +; Osprey, +; Chimney Swift, +; E. Phoebe, +; Alder Flycatcher, +; E. Wood Pewee, +; Com. Raven, +; Golden-winged Warbler, +; Yellow-rumped Warbler, +; Purple Finch, +. **Total:** 29 species; 68 territorial males (490/km², 198/100 acres). — CONNIE J. PEARSON and JOHN R. PROBST, North Central Forest Experiment Station, U.S. Forest Service, St. Paul, Minn. 55108.

81. DISTURBED OAK-HICKORY FOREST, PINE STAND, EDGE, AND POND. —

Location: Ohio; Licking Co., Eden Township, Camp Falling Rock, 1.2 mi NNE of the intersection of County Road 210 and State Route 79; 40°11'N, 82°18.5'W, Newark Quadrangle, USGS. **Continuity:** Established 1937; 40 intermittent years. **Size:** 14.16 ha = about 35 acres. **Description of Plot:** See *Bird Lore* 39:379-380 (1937). **Habitat changes:** No major changes took place. **Weather:** Typical patterns held throughout the breeding season. **Coverage:** May 28; June 3, 6; Aug. 13, 27. **Total:** 28 man-hours. **Census:** Red-eyed Vireo, 8 (56, 23); Scarlet Tanager, 7 (49, 20); Acadian Flycatcher, 6 (42, 17); Wood Thrush, 6; Am. Robin, 5 (35, 14); House Wren, 3 (21, 9); Gray Catbird, 3; Cerulean Warbler, 3; Cardinal, 3; Chipping Sparrow, 3; Mourning Dove, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Kentucky Warbler, 2; Ruffed Grouse, 1; Yellow-billed Cuckoo, 1; Screech Owl, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Blue Jay, 1; Carolina Chickadee, 1; White-breasted

Nuthatch, 1, Blue-gray Gnatcatcher, 1, Cedar Waxwing, 1, Louisiana Waterthrush, 1, N. Oriole, 1; Brown-headed Cowbird, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Song Sparrow, 1. **Total:** 38 species; 84 territorial males and females (593/km², 240 pairs/100 acres). **Remarks:** The severe winter weather probably accounts for a lack of Carolina Wrens, and Perhaps for the low numbers of House Wrens and phoebes. Populations of the Ruby-throated Hummingbird, Acadian Flycatcher, E. Wood Pewee, Wood Thrush, Red-eyed Vireo, Cerulean Warbler, Ovenbird, and Kentucky Warbler continue to remain below their peak densities. One might suspect that such densities could be considered as new levels of stabilization resulting from all factors in the environment as well as over-all continental influences. A web-worm infestation, less severe than previous ones, caused leaf damage to trees (mostly Scarlet Oak). Previous damage to this species caused a significant loss of trees in the upland zone (AFN 22:721, 23;752), and understory and ground cover have increased. Species diversity remains near the high level of 39 but the distribution of densities for the past few years has not been as symmetrical as in the past, especially during the mid-decades of census history. Five species: Acadian Flycatcher, Am. Robin, Wood Thrush, Red-eyed Vireo and Scarlet Tanager account for 32 pairs, 38.1% of the total 84. Nineteen species, however, each with only 1 pair, account for 22.6%; 9 species, with two pairs each, for 21.4%; 5 species, with three pairs each, for 17.9%. The lack of any species with 4 pairs and the number of them with low densities characterize this census. Territories of 1 pair each of Cooper's and Red-tailed Hawks are included in the census area, but no direct predation was observed within the census plot. Cowbird parasitism was minor with only the Louisiana Waterthrush observed feeding a young cowbird. — A. H. CLAUGUS, 228 S Lake St., Carey, Ohio, 43316.

82. ABANDONED FIELD AND PASTURE. —

Location: Indiana; Wayne Co., about 127 m S of Richmond city limits on Abington Pike; 39°49'N, 84°54'30"W, Richmond Quadrangle, USGS. **Continuity:** New. **Size:** 9.83 ha = 24.3 acres (irregular, measured). **Description of Plot:** Two irregular fields; 70% abandoned field primarily brome grass (*Bromus* sp.), with scattered shrubs and small trees. Dominant trees and shrubs are Osage Orange (*Maclura pomifera*) and Black Cherry (*Prunus serotina*); 30% is sparsely grazed cow pasture. A quantitative survey of the vegetation gave the following results. Trees 3-in. diameter and over, based on ten 0.1 acre circular samples, 17/acre; total basal area 34.2 ft²/acre. Species comprising 90% of the total number of trees: Osage Orange 27, 68, 64, 40; Black Cherry 13, 33, 36, 20. Shrubs calculated as above, comprising 90% of the total number of shrubs: Black Cherry 56, 37, 37, 70; Osage Orange 49, 32, 32, 60; Choke Cherry (*P. virginiana*) 18, 12, 12, 40; Box Elder (*Acer negundo*) 12, 8, 8, 40; Honey Locust (*Gleditsia triacanthos*) 5, 3, 3, 40. Shrub stems/acre, 765. Ground cover, 100%. **Edge:** Primarily similar habitat, fallow alfalfa, farm fields, roads and corn fields. **Topography:** Mostly flat with some rolling hills and a few gullies. **Elevation:** 963 ft. **Coverage:** May

11-12, 14, 18, 21-22, 24-25, 27-31, June 1-3
 Total hours 80 **Census:** Red-winged Blackbird, 19 (193, 78); Song Sparrow, 5 (51, 21); Cardinal, 3; Willow Flycatcher, 2; Yellow Warbler, 2; Com. Yellowthroat, 2; E. Meadowlark, 2; Mockingbird, 1; Gray Catbird, 1; Brown Thrasher, 1; House Wren, 1; Am. Robin, 1; Starling, 1; House Sparrow, 1; Field Sparrow, 1. **Total:** 15 species; 43 territorial males (437, 177). **Visitors:** Barn Swallow, Com. Grackle, Am. Goldfinch. **Remarks:** Nests: Red-winged Blackbird, 9; Cardinal, 1. — WAYNE HUGHES, JOEL KATZ, JON KURTZ, DAVID STORER, AMIE TROBAUGH, Biol. Dept., Earlham College, Richmond, Ind. 47374.

83. OLD FIELD WITH BRUSH PATCHES. — **Location:** Indiana; Jefferson Co., Clifty Falls State Park, NW corner at 38° 45' 11" N, 85° 24' 52" W; in Sect. 33, T4N, R10E, Clifty Falls Quadrangle, USGS. **Continuity:** Established 1976; 2 intermittent years. **Size:** 17 05 ha = 42.13 acres (irregular rectangle, measured with steel tape and compass). **Description of Plot:** See AB 30:1056-1057 (1976) and 31:61-62 (1977). Succession in the last 2 years has increased tall forbs, decreased grasses, and made few changes in woody plants. **Weather:** Six times clear and 4 cloudy; no precipitation during counts; temperatures 52-79°F; winds Beaufort 0 to 3 (mostly 1); about average weather for the dates. **Coverage:** May 26-27, 29, 31; June 1, 8-9, 18. Total man-hours: 27. **Census:** Field Sparrow, 16 (94, 38); Com. Yellowthroat, 15.5 (91, 37); Indigo Bunting, 9 (53, 21); Yellow-breasted Chat, 8 (47, 19); Song Sparrow, 5.5 (32, 13); Am. Goldfinch, 5 (29, 12); Prairie Warbler, 4 (23, 9); Gray Catbird, 3.5 (21, 8); White-eyed Vireo, 3.5; Red-winged Blackbird, 3.5; Cardinal, 3.5; Henslow's Sparrow, 3.5; Bobwhite, 3 (18, 7); Brown Thrasher, 3; Mourning Dove, 2; Willow Flycatcher, 2; Yellow Warbler, 2; Black-billed Cuckoo, 1.5; Rufous-sided Towhee, 1.5; Grasshopper Sparrow, 1.5; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1 (female); E. Kingbird, 1; Mockingbird, 1; Blue-gray Gnatcatcher, 1; Brown-headed Cowbird, 1 (female); N. Oriole, 1; Com. Flicker, 0.5; Summer Tanager, 0.5; E. Meadowlark, 0.5; Great Crested Flycatcher, + **Total:** 32 species; 106.5 territorial males (625/km², 253/100 acres). Paul Carmony, Robert Mindick, and Juanita R. Webster helped with the census work, but their time was not calculated above. — J. DAN WEBSTER, Hanover College, Hanover, Ind. 47243.

84. SUBURBAN CEMETERY. — **Location:** Indiana; Wayne Co., Earlham Cemetery, along Route 40 W on the W edge of Richmond; 39° 49' 20" N, 84° 55' W, Richmond Quadrangle, USGS. **Continuity:** New. **Size:** 5.87 ha = 14.5 acres (roughly rectangular, measured from map aided by several field measurements). **Description of Plot:** Established as a cemetery in 1862; contains 2 small dwellings and a paved loop road. **Vegetation:** Composed primarily of mature Norway Maple (*Acer platanoides*) and Norway Spruce (*Picea abies*). Mowed lawn is the most prominent ground cover. A quantitative survey of vegetation yielded the following results: Trees, 3-in. or more in diameter, from seven 0.1-acre cir-

cular samples, 29/acre, total basal area 34.4 ft²/acre. Species comprising 90% of the total number of trees: Hackberry (*Celtis occidentalis*), 10, 33, 6, 8; Norway Spruce, 6, 19, 13, 17; Norway Maple, 4, 14, 45, 25; Arbor Vitae (*Thuja occidentalis*), 3, 10, 2, 17; White Mulberry (*Morus alba*), 3, 10, 2, 8; Tulip-tree (*Liriodendron tulipifera*), 1, 5, 29, 8. Trees by diameter size class: A (3-6 in.) 8, 29, 0, 8, 2; B (6-9 in.) 8, 29, 2, 5, 7; C (9-15 in.) 7, 24, 5, 6, 16; E (21-27 in.) 3, 10, 8, 7, 25; F (27-33 in.) 1, 5, 6, 9, 20; G (33-40 in.) 1, 5, 9, 9, 29. Shrub stems/acre 1143; ground cover 91%; pavement 8%; canopy cover 44%; average canopy height 58 ft (range 15-90). **Edge:** N bordered by highway, E by a dense row of trees and shrubs with grass lawns beyond, SW by a stream gully of second-growth deciduous forest, NW by grass lawn. **Topography:** Level to gradual slope, mostly W-facing. **Elevation:** 960 ft. **Weather:** Temperatures normal, precipitation below normal in contrast to a generally late, wet spring. **Coverage:** May 26-31; June 1-2; 0500-0630 or 1900-2030 hours. Total man-hours: 32. **Census:** Am. Robin, 15 (256, 103); Cardinal, 13 (222, 90); Mourning Dove, 8 (136, 55); Chipping Sparrow, 6 (102, 41); E. Wood Pewee, 3 (51, 21); Com. Flicker, 2; Blue Jay, 2; Gray Catbird, 2; Starling, 2; Red-eyed Vireo, 2; Song Sparrow, 2; Red-bellied Woodpecker, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Indigo Bunting, 1; E. Bluebird, 1; Com. Grackle, 1; Brown-headed Cowbird, 0.5. **Total:** 18 species; 63.5 territorial males or females (1082/km², 438/100 acres). **Remarks:** Goldfinches and grackles from an adjacent, uncensused area were observed feeding in the plot. Special thanks to W. H. Buskirk for assistance. — RICK BUSING, TRESSA CATHCART, EDMUND WICKERSHAM and BOB CUCINOTTA, Biology Dept., Earlham College, Richmond, Ind. 47374.

85. DECIDUOUS CLEARCUT. — **Location:** Tennessee; Washington Co., Horse Cove Gap; about 4.5 mi S of Johnson City; 36° 14' N, 82° 22' W, Erwin Quadrangle, USGS. **Continuity:** Established 1975; 4 consecutive years. **Size:** 20.23 ha = 50 acres. **Description of Plot:** See AB 29:1117-8 (1975). **Weather:** Clear. **Coverage:** May 20-21, 27-30; June 3-4; 0600-0830. Total man-hours: 12. **Census:** Rufous-sided Towhee, 11 (54, 22); Yellow-breasted Chat, 10 (49, 20); White-eyed Vireo, 7 (35, 14); Hooded Warbler, 7; Indigo Bunting, 7; Ruby-throated Hummingbird, 5 (25, 10); Chestnut-sided Warbler, 5; Kentucky Warbler, 4 (20, 8); Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Brown-headed Cowbird, (female) 1; Cardinal, 1. **Total:** 13 species; 61 territorial males or females (301/km², 122/100 acres). **Remarks:** Total density highest yet, 67 territories this year compared to 53 in 1977, 32 in 1976, 33 in 1975. Six species had increases of 3 or more territories over last year: Ruby-throated Hummingbird (1 to 5), White-eyed Vireo (4 to 7), Chestnut-sided Warbler (1 to 5), Yellow-breasted Chat (6 to 10), Hooded Warbler (4 to 7) and Rufous-sided Towhee (8 to 11). No Carolina Wrens were observed this year. — RICHARD P. LEWIS, Rt. 2, Box 435, Johnson City, Tenn. 37601.

86. DECIDUOUS FOREST AND CONTOUR STRIP MINE. — **Location:** Tennessee; Campbell Co., on SE slope of Walnut Mountain, 3.1 mi NW of La Follette; 36° 24' 30" N, 84° 09' 53" W; Ivydell Quadrangle. **Continuity:** New. **Size:** 23.4 ha = 57.8 acre; mined area is 10.5 ha = 25.9 acre (measured with planimeter and aerial photograph). **Description of Plot:** Includes an area mined approximately 12 years ago and a forested area immediately uphill of the mine. The mine extends approximately NW-SW along the 2100 ft contour for 1.2 km and varies in width from 60-160 m. The mined area consists of a fairly level bench, separating highwall and outslope areas. The highwall, almost vertical in many places, is up to 20 m tall with many rock outcrops. The outslope is up to 95 m wide, with a maximum vertical drop of 30 m. Many eroded gullies occur and erosion control structures were built in 1977. Erosion of both the highwall and outslope is continual. The forested area is steep and xeric on southern exposures. A small stream crosses near the S end and two ponds occur along the base of the highwall. A gravel road, with light truck traffic, crosses the mine lengthwise. The outslope and highwall are mostly devoid of vegetation, and clumps of trees and shrubs occur on the bench area. Tree density is 116 3-6 in. dbh trees per ha (47/acre) and 27 6-9 in. trees per ha (11/acre) on the bench and outslope. In descending order of frequency, these are Shortleaf Pine (*Pinus echinata*), Virginia Pine (*P. virginianum*), Black Locust (*Robinia pseudo-acacia*), Tulip-tree (*Liriodendron tulipifera*), Black Willow (*Salix nigra*), and Red Maple (*Acer rubrum*). Shrub density, mostly *Rubus*, pines, locust, and Pokeweed (*Phytolacca americana*), was 2255 stems/acre. Canopy closure on bench and outslope areas was 26%, canopy height 16 ft. Ground cover, mostly grasses, *Smilax*, and various asters, was 38%. A quantitative survey of the vegetation of the forested area gave: Trees 3-in. and over, 298/acre, total basal area, 98.6 ft²/acre. Species comprising 90% of the total number of trees: Red Maple, 49, 16, 8, 80; Hickory (*Carya* spp.), 45, 15, 39, 100; Chestnut Oak (*Quercus prinus*), 45, 15, 12, 60; N. Red Oak (*Q. rubra*), 39, 13, 3, 40; Black Oak (*Q. velutina*), 23, 8, 8, 80; Black Gum (*Nyssa sylvatica*), 19, 7, 5, 80; Black Locust, 16, 5, 4, 80; Flowering Dogwood (*Cornus florida*), 16, 5, 3, 60; Sourwood (*Oxydendrum arboreum*), 13, 4, 1, 40; Shortleaf Pine, 10, 3, 2, 20. Trees by diameter size class A (3-6 in.) 181, 61, 20, 20; B (6-9 in.) 62, 21, 18.9, 19; C (9-15 in.) 32, 11, 25.4, 26; D (15-21 in.) 23, 8, 35.3, 35. Remaining tree species include White Oak (*Q. alba*), Tulip-tree, Black Walnut (*Juglans nigra*), Virginia Pine, and White Ash (*Fraxinus americanus*). Shrub stems averaged 15,682/acre; ground cover, 27%; canopy cover, 90%; average canopy height 37 ft (range 18-60 ft). **Edge:** Bordered by similar forest on 3 sides, and by similar strip mine to the S. **Topography:** Elevation, 2000-2280 ft; surrounding area is mountainous. **Weather:** Mid-day cool and wet, otherwise warm and dry, occasional early morning fog; temperature during censuses 55-88°F. **Coverage:** Apr. 27; May 1, 15, 23, June 7, 9, 14, 27; 0625-1110 and 1900-2230, EDT. Total man-hours: 15. **Census:** Red-eyed Vireo, 7 (30, 12); Indigo Bunting, 7; Ovenbird 6.5 (28, 11); Black-and-white Warbler, 6 (26, 10); Rufous-sided Towhee, 6; Worm-eating



Warbler, 5.5 (24, 10), Scarlet Tanager, 3.5 (15, 6), Carolina Chickadee, 3 (13, 5), Wood Thrush, 3; Blue-gray Gnatcatcher, 3; Hooded Warbler, 3; Whip-poor-will, 2; Tufted Titmouse, 2; Yellow-throated Vireo, 2; Cerulean Warbler, 2; Am. Redstart, 2; Brown-headed Cowbird, 2; Am. Goldfinch, 2; Kentucky Warbler, 1.5; E. Phoebe, 1; Acadian Flycatcher, 1; Rough-winged Swallow, 1; Golden-winged Warbler, 1; Sharp-shinned Hawk, +; Screech Owl, +; White-breasted Nuthatch, +; Com. Crow, +; Chestnut-sided Warbler, +; Summer Tanager, +. **Total:** 29 species; 73 territorial males or females (312/km², 126/100 acres). **Visitors:** Yellow-billed Cuckoo, Ruby-throated Hummingbird, Hairy Woodpecker, Downy Woodpecker, Blue Jay, Cedar Waxwing, Field Sparrow. **Remarks:** Nests found: Whip-poor-will, E. Phoebe, Ovenbird, Rufous-sided Towhee, 1 each. Fledglings noted: Carolina Chickadee, Blue-gray Gnatcatcher, Worm-eating Warbler, Golden-winged Warbler, Ovenbird, Kentucky Warbler. Small wooded patches on the mine were visited by Red-eyed Vireos, Black-and-white Warblers, Worm-eating Warblers, and Kentucky Warblers; an Ovenbird may have nested in one of the patches. Sharp-shinned Hawk observed on 2 visits, Summer Tanager on 3. This study was funded by an orphan mine reclamation project coordinated by the Tennessee Valley Authority. — CHARLES P. NICHOLSON, P.O. Box 402, Norris, Tenn. 37828.

87. MIXED - MESOPHYTIC WOODS, FIELDS, AND BRUSH. — **Location:** Tennessee; Putnam Co., about 5 mi WNW of Monterey, in Barnes Hollow to NW of Lee Knob; 36°9'45"N, 85°22'W, Monterey Quadrangle, USGS. **Continuity:** Wooded portions (about 53 acres) new; open portions established 1977. (Formerly called Pastures with Brush, Wooded Strips, and Scattered Trees). **Size:** 30 ha = 74 acres (irregular, taken largely from official property survey map). **Description of Plot:** See AB 32:80 (1978). The most abundant tree, the Tulip-tree (*Liriodendron tulipifera*), is mostly on the N slope. White Oak (*Quercus alba*) is an important species almost confined to the S slope. Other numerous tree species attaining a dbh over 6 in. dbh are Sugar Maple (*Acer saccharum*), Red Maple (*A. rubrum*), N. Red Oak (*Q. rubra*), Chinquapin Oak (*Q. muehlenbergii*), Black Oak (*Q. velutina*), Shagbark Hickory (*Carya ovata*), Am. Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana*), and Yellow Buckeye (*Aesculus octandra*). Numerous trees of lesser size are Flowering Dogwood (*Cornus florida*), Hornbeam (*Carpinus*), Sassafras, Sourwood (*Oxydendrum*), Redbud (*Cercis canadensis*), and locally, Red Cedar (*Juniper virginiana*). Rather frequent tree species attaining a larger size (over 6 in. dbh) are White Basswood (*Tilia heterophylla*), Winged Elm (*Ulmus alata*), Black Gum (*Nyssa sylvatica*), Persimmon (*Diospyros*), Bitternut Hickory (*C. cordiformis*), Mockernut Hickory (*C. tomentosa*), Pignut Hickory (*C. ovalis* and *C. glabra*), Cucumber Tree (*Magnolia acuminata*), Black Walnut (*Juglans nigra*), and Shumard Oak (*Q. shumardii*). Grape vines (*Vitis aestivalis*) are often numerous, and attain the canopy. Other vines are Crossvine (*Anisostichus capreolata*), Virginia Creeper (*Parthenocissus quinquefolia*), and Poison Ivy (*Rhus*

radicans), all numerous and all often forming part of the ground cover. Herbaceous species are very numerous. Rocks, both limestone and sandstone, usually with mosses and lichens on them, form about 20-25% of the ground cover. **Changes:** No grazing this year. A small orchard and vegetable garden were planted, altering about 2 acres. **Weather:** Early spring warm and dry; killing frost April 22 damaged some tender foliage in the open. Summer temperatures about normal; quite dry in late June — early July; August very wet (flooding Aug. 20). **Coverage:** Apr. 14, 22, 27; May 2, 6-7, 10-11, 17-19, 31; June 4-5, 10, 14, 16, 23; evening trips May 21, 29; June 10; Aug. 10; 0457-2035 hours, CDT. Total man-hours: 54. **Census:** Red-eyed Vireo, 23.5 (78, 32); Indigo Bunting, 7.5 (25, 10); Blue-gray Gnatcatcher, 7 (23, 9); Acadian Flycatcher, 6.5 (22, 9); Yellow-breasted Chat, 5 (17, 7); Prairie Warbler, 4.5 (15, 6); Kentucky Warbler, 4 (13, 5); Yellow-billed Cuckoo, 3 (10, 4); Tufted Titmouse, 3; Cardinal, 3; Scarlet Tanager, 2.5; Rufous-sided Towhee, 2.5; Field Sparrow, 2.5; Ruby-throated Hummingbird, 2; White-eyed Vireo, 2; Com. Yellowthroat, 2; Hooded Warbler, 2; Summer Tanager, 2; Whip-poor-will, 1.5; Carolina Chickadee, 1.5; Wood Thrush, 1.5; Ovenbird, 1.5; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Yellow-throated Vireo, 1; Worm-eating Warbler, 1; Brown-headed Cowbird, 1; Am. Goldfinch, 1; Mourning Dove, 0.5; Screech Owl, 0.5; Hairy Woodpecker, 0.5; Blue Jay, 0.5; Brown Thrasher, 0.5; Red-tailed Hawk, +; Broad-winged Hawk, +; E. Meadowlark, +. **Total:** 36 species; 99 territorial males or females (331/km², 134/100 acres). **Visitors:** Turkey Vulture, Sharp-shinned Hawk, Ruffed Grouse, Chimney Swift, Com. Crow, Cerulean Warbler, Red-winged Blackbird, Blue Grosbeak. **Remarks:** Nests found: 1 Kentucky Warbler, 1 Field Sparrow. Young seen include 1 Red-tailed Hawk (nest off plot; also in 1977), Indigo Bunting, and Field Sparrow. There was an emergence (not large) of 17-year cicadas (3 species) in early June. — RICHARD W. SIMMERS, JR., 515 Laurel Ave., Apt. 9, Cookeville, Tenn. 38501.

88. STRIP MINE AND DECIDUOUS WOODLOT. — **Location:** Tennessee; Scott Co., 2.3 mi NW of Winfield, 36°34'23"N, 84°29'13"W; Winfield Quadrangle. **Continuity:** New. **Size:** 20.1 ha = 49.6 acre (measured by planimeter from aerial photo). **Description of Plot:** A horseshoe-shaped strip mine enclosing a 3.9 ha = 9.6 acre woodlot. The E arm of the mine was mined in 1973, and the W part in 1970. Mining was carried out by scraping off the vegetation and topsoil, removing the exposed coal seam, and then some regrading of topsoil. The resultant disturbed areas are fairly level, with the only major topographic feature being a rock and dirt highwall surrounding the woodlot. Mined areas have scattered herbaceous and shrub growth, which is denser and taller on the E arm. Most of the W area is exposed mineral soil. Most common shrubs are *Rosa multiflora*, Pokeweed (*Phytolacca americana*), Elderberry (*Sambucus canadensis*), *Rubus*, Staghorn Sumac (*Rhus typhina*), Shortleaf Pine (*Pinus echinata*) and Virginia Pine (*P. virginianum*). Herbaceous cover consists of various grasses including Broomsedge (*Andropogon virginianum*), goldenrod (*Solidago* spp.), *Lespedeza*,

Patridge Pea (*Cassia fasciculata*), and Ragwort (*Senecio smalli*). Seven ponds, the largest 0.3 ha cover a total area of 1.1 ha and surround part of the woodlot. Three of these ponds support stands of Cat-tail (*Typha latifolia*). Dirt roads cross the W part of the mine and the woodlot. The woodlot is located on the S end and is connected to surrounding forest by a fencerow on the E and a wooded strip 20-35 m wide on the W. Major tree species and stems/acre, in decreasing order of abundance, are Red Maple (*Acer rubrum*) 146, Chestnut Oak (*Quercus prinus*) 58, Sourwood (*Oxydendrum arboreum*), White Oak (*Q. alba*) 21, and Flowering Dogwood (*Cornus florida*) 21. Stems/acre and basal area (ft²/acre) by diameter size classes are: A (3-6 in.) 241, 266; B (6-9 in.) 96, 293; C (9-15 in.) 29, 324. Shrub stems averaged 13,905/acre, ground cover 23%; canopy cover 80%; canopy height 27 ft (range 15-40 ft). **Edge:** Similar mines adjoin the N side; the E and W sides are mixed forest. The census area extended approximately 25 m into the forest. A hardwood clearcut, approximately 5 year old, adjoins the NW corner and a pasture is S of the plot. **Topography:** The E part of the mine is flat, and the W has several gullies crossing it. The woodlot is rolling, and separated from the mined area by a highwall with a maximum height of 9 m. There is no outcrop area. Average elevation is 423 m and maximum relief is 20 m. **Weather:** Mid-May cool and wet; otherwise warm and dry. Temperature during censuses 60-90°F. **Coverage:** May 10, 26; June 2, 18, 20, 26, 29; 0630-1200, EDT. Total man-hours: 16.5. **Census:** Indigo Bunting, 14 (70, 28); Field Sparrow, 5 (25, 10), Rough-winged Swallow, 3 (15, 6); Blue-gray Gnatcatcher, 3; Red-eyed Vireo, 3; Prairie Warbler, 3; Red-winged Blackbird, 3; Cardinal, 2.5; White-eyed Vireo, 2; Am. Goldfinch, 2; Yellow-breasted Chat, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; E. Kingbird, 1; Tufted Titmouse, 1; Brown Thrasher, 1; Yellow-throated Vireo, 1; Brown-headed Cowbird (female), 1; Rufous-sided Towhee, 1, Bobwhite, +; Pine Warbler, +. **Total:** 21 species; 50 territorial males or females (249/km², 101/100 acre). **Visitors:** Wood Duck, Ruby-throated Hummingbird, Belted Kingfisher, Com. Flicker, Pileated Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Barn Swallow, Blue Jay, Com. Crow, Carolina Chickadee, Gray Catbird, E. Bluebird, E Meadowlark, Summer Tanager. **Remarks:** At least 2 pairs of Rough-winged Swallows nested in the highwalls above the ponds; 11 Red-winged Blackbird and 1 Prairie Warbler nests were found. The absence of breeding warblers in the woodlot was unexpected. This study was funded by an orphan mine reclamation project coordinated by the Tennessee Valley Authority. — CHARLES P. NICHOLSON, P.O. Box 402, Norris, Tenn. 37828.

89. DECIDUOUS CLEARCUT. — **Location:** Georgia; Rabun Co., Chattahoochee National Forest; 5 mi SE of Clayton; Tiger Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 6.88 ha = 17 acres. **Description of Plot:** See AB 32:80-1 (1977). **Weather:** Warm and clear. **Coverage:** May 6-7, 19, 21; June 3, 10, 18, 24; 0730-0930. Total man-hours: 17. **Census:** Rufous-sided Towhee, 12 (174, 71), Indigo Bunting, 4 (58, 24); Prairie Warbler, 4, Bobwhite, 2; Mourning Dove, 1; Carolina

Chickadee, 1, Brown-headed Nuthatch, 1, Carolina Wren, 1, Brown Thrasher, 1, E. Bluebird, 1; Yellow-breasted Chat, 1; Brown-headed Cowbird, 1; Cardinal, 1; Am. Goldfinch, 1. **Total:** 14 species; 32 territorial males or females (465/km², 188/100 acres). **Visitors:** Chimney Swift, Ruby-throated Hummingbird, Com. Flicker, Pileated Woodpecker, Great Crested Flycatcher, E. Phoebe, Purple Martin, Barn Swallow, Blue Jay, Com. Crow, Tufted Titmouse, Gray Catbird, Blue-gray Gnatcatcher, Solitary Vireo, Red-eyed Vireo, Chestnut-sided Warbler, N. Oriole, Scarlet Tanager, Summer Tanager. **Remarks:** Nests found: Bluebird and Brown-headed Nuthatch. The Brown-headed Nuthatch represented a range extension of 7 mi farther N in the country than previously recorded. There was an increase of 6 breeding species from the previous census. — LOUIS W. SCHWEIZER, 1729B LaVista Rd. NE, Atlanta, Ga. 30329.

90. KENTUCKY BLUE GRASS PRAIRIE. — **Location:** North Dakota; Stutsman Co., NE quarter of Sec. 12, T142N, R68W; 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 4.86 ha = 12 acres. **Description of Plot:** See AB 26:972 (1972). This plot was subjected to a prescribed burn in fall 1972, and on June 1, 1977. **Weather:** After several years of subnormal precipitation, rains in the latter half of 1977 and snow during the following winter resulted in a return to typical conditions. Most seasonal and semi-permanent wetlands contained water during the census period. Precipitation totaled 3.08 in in May and 4.02 in. in June. Temperatures in May were above normal, with average extremes of 43° and 72°F. June temperatures were approximately average; the daily low averaged 49°, the high, 78°F. **Coverage:** May 29, June 2, 4, 6, 8, 28; 8 trips, 0645-1140, CDT. Total man-hours: 3. **Census:** Bobolink, 2, Red-winged Blackbird, 1; Short-billed Marsh Wren, 0.5; W. Meadowlark, 0.5; Brown-headed Cowbird (female), 0.5. **Total:** 5 species; 4.5 territorial males or females (93/km², 38/100 acres). **Visitors:** Com. Snipe, E. Kingbird, Bank Swallow, Barn Swallow, Am. Goldfinch. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

91. MIXED PRAIRIE I. — **Location:** North Dakota; Stutsman Co., NE quarter of Sec. 11, T142N, R68W; 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 10 ha = 24.7 acres. **Description of Plot:** See AB 26:972 (1972). All wetlands were restored by precipitation prior to census period. **Weather:** See Census 90. **Coverage:** May 29; June 2, 6, 8, 28, 8 trips, 0705-1120, CDT. Total man-hours: 7. **Census:** Clay-colored Sparrow, 4.5 (45, 18); Blue-winged Teal, 3.5 (35, 14); Red-winged Blackbird, 3.5; Com. Yellowthroat, 2.5, W. Meadowlark, 2; Brown-headed Cowbird (females), 2; Willow Flycatcher, 1; Yellow Warbler, 1; Bobolink, 1; Gadwall, 0.5; Pintail, 0.5; E. Kingbird, 0.5; Com. Snipe, +; Am. Goldfinch, +; Savannah Sparrow, +. **Total:** 15 species; 22.5 territorial males or females (225/km², 91/100 acres). **Visitors:** Black-crowned Night Heron, Am. Bittern, Mallard, Green-winged Teal, Upland Sandpiper, W. Kingbird, Barn Swallow, Gray Cat-

bird, Com Grackle — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

92. MIXED PRAIRIE II. — **Location:** North Dakota; Stutsman Co., SW quarter of Sec. 1, T142N, R68W; 47°8'N, 99°15'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:972-973 (1972) and AB 32:81-82 (1978). This plot was burned in fall 1971 and spring 1976. Since the last burn, the vegetation, nearly all herbaceous, has regrown and litter has accumulated. All six seasonal wetlands were wet, but the two temporary wetlands were mostly dry throughout the census period. **Weather:** See Census 90. **Coverage:** May 29; June 2, 4, 6, 8, 28; 8 trips, 0710-0935, CDT. Total man-hours: 4. **Census:** Red-winged Blackbird, 2; Blue-winged Teal, 1.5; W. Meadowlark, 1; Killdeer, 0.5; Com. Snipe, 0.5; Brown-headed Cowbird (female), 0.5; E. Kingbird, +; Com. Yellowthroat, +; Savannah Sparrow, +. **Total:** 9 species; 6 territorial males or females (98/km², 40/100 acres). **Visitors:** Pintail, N. Shoveler, Mourning Dove, W. Kingbird, Yellow-headed Blackbird, N. Oriole, Com. Grackle. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

93. MIXED PRAIRIE III. — **Location:** North Dakota; Stutsman Co., NW quarter of SW quarter of Sec. 6, T142N, R67W; 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:973 (1972). This plot was burned fall 1970, spring 1975, and again on June 1, 1977. Herbaceous vegetation has substantially regrown, but shrubs (mostly Wolfberry, *Symphoricarpos occidentalis*) are still reduced in stature. **Weather:** See Census 90. **Coverage:** May 29; June 2, 4, 6, 8, 28; 8 trips, 0740-1125, CDT. Total man-hours: 3. **Census:** Bobolink, 1; W. Meadowlark, 1; Red-winged Blackbird, 0.5; Brown-headed Cowbird (female), 0.5; Chestnut-collared Longspur, +. **Total:** 5 species; 3 territorial males or females (49/km², 20/100 acres). **Visitors:** Pintail, Com. Snipe, Com. Nighthawk, Yellow-headed Blackbird, Am. Goldfinch, Savannah Sparrow. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

94. MIXED PRAIRIE IV. — **Location:** North Dakota; Stutsman Co., SE quarter of Sec. 11, T142N, R68W; 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:973-974 (1972). This plot was burned in spring 1970, fall 1972, and again spring 1976. Vegetation has regrown since the last fire. Wetlands contained water during the census period. **Weather:** See Census 90. **Coverage:** May 29; June 2, 4, 6, 8, 28; 8 trips, 0720-0955, CDT. Total man-hours: 4. **Census:** Red-winged Blackbird, 3 (49, 20); Blue-winged Teal, 1; W. Meadowlark, 1; Brown-headed Cowbird (female), 1; Bobolink, 0.5; Com. Snipe, +; Upland Sandpiper, +; E. Kingbird, +; Com. Yellowthroat, +; Grasshopper Sparrow, +. **Total:** 10 species; 6.5 territorial males or females (107/km², 43/100 acres).

Visitors: Pintail, N. Shoveler, Sharp-tailed Grouse, W. Kingbird, Yellow-headed Blackbird, Com. Grackle, Am. Goldfinch — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

95. MIXED PRAIRIE V. — **Location:** North Dakota; Stutsman Co., SE quarter of Sec. 12, T142N, R68W; 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 7 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:974 (1972) and AB 32:82 (1978). **Weather:** See Census 90. **Coverage:** May 29, June 2, 4, 6, 8, 28; 8 trips, 0645-1045, CDT. Total man-hours: 4.5. **Census:** Grasshopper Sparrow, 3 (49, 20); Bobolink, 2; W. Meadowlark, 1.5; E. Kingbird, 1; Brown-headed Cowbird (female), 1; Clay-colored Sparrow, 1; Chestnut-collared Longspur, 1, Willet, +; Marbled Godwit, +; Short-eared Owl, +; Com. Nighthawk, +. **Total:** 11 species; 10.5 territorial males or females (172/km², 70/100 acres). **Visitors:** Sharp-tailed Grouse, Killdeer, Bank Swallow, Barn Swallow, Am. Goldfinch, Savannah Sparrow, Baird's Sparrow. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

96. MIXED PRAIRIE VIII. — **Location:** North Dakota; Stutsman Co., NW quarter of Sec. 1, T142N, R68W; 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1973; 3 intermittent years. **Size:** 8.7 ha = 21.5 acres. **Description of Plot:** See AB 27:990 (1973) and AB 32:82 (1978). Seven seasonal wetlands partially or entirely within the plot contained water throughout the census period. **Weather:** See Census 90. **Coverage:** May 29; June 2, 4, 6, 8; 7 trips, 0700-1205, CDT. Total man-hours: 4. **Census:** Red-winged Blackbird, 4 (46, 19); Blue-winged Teal, 2.5; W. Meadowlark, 1.5, Brown-headed Cowbird (female), 0.5; Savannah Sparrow, 0.5; Gadwall, +; Sharp-tailed Grouse, +; Killdeer, +. **Total:** 8 species, 9 territorial males or females (103/km², 42/100 acres). **Visitors:** Mallard, N. Shoveler, Am Coot, Com. Snipe, Willet, Marbled Godwit, Black Tern, Com. Nighthawk, E. Kingbird, Yellow-headed Blackbird. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

97. FLOODPLAIN TALLGRASS PRAIRIE. — **Location:** Kansas, Douglas Co., portion of Baker Wetlands Research Area (Baker Univ., Baldwin City). It occupies much of the NW ¼, SW 1.4, Section 18, T13N, R20E, Lawrence East Quadrangle, USGS. **Continuity:** Established 1974; censused 1974-78 but results published only for 1974, 1975 and 1978. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AB 28:1031-1032 (1974). **Weather:** The mean temperature during the period was 26° C, slightly higher than the June average. Rainfall was 6.4 cm below normal for June (1.5 cm fell during study period). **Coverage:** June 21-27; 0600-1100. Total man-hours: 72. **Census:** Dickcissel, 24 (237, 96), Com. Yellowthroat, 7 (69, 28); Red-winged Blackbird, 5 (49, 20); Bobwhite, 1; E. Meadowlark, 1. **Total:** 5 species; 38 territorial males (376/km², 152/100 acres). **Remarks:** An Am. Kestrel flew over during several censuses

and Green Heron, Killdeer, Lesser Yellowlegs, Upland Sandpiper and Am Goldfinch, were observed at least once. Regular aerial foragers included: Chimney Swift, 1; Barn Swallow, 4; Purple Martin, 1. Nests found included 14 Red-winged (all along boundaries) and 10 Dickcissel (1 parasitized by cowbird). The most interesting change in the area over the 5-year period has been the increase in Dickcissels from 10 in 1974 to 24 in 1978. Part of this increase stems from the loss of nearby breeding habitat. Mowing and subsequent continuous cattle grazing of a prairie-shrub area N of the plot in the fall of 1975 resulted in an increase of 5 territorial males in 1976 over the 14 observed in 1975. Further increases may be because the plot was not completely mowed in the fall of 1977, as it usually is, and this provided a large number of sunflower stalks as singing posts the following spring. Many more of these additional territorial Dickcissels appear to be surplus males with no females on their territories. A slight increase in the number of yellowthroats may also be due to nearby habitat losses. This census was done as part of a class project assisted by Richard F. Johnston, J. E. Bucher, D. Johnson, C. T. S. Lowther, and D. Sinns. Our thanks to Ivan Boyd of Baker Univ. for permission to use this area for study. — *PETER E. LOWTHER, and CALVIN L. CINK, Biology Department, Baker Univ., Baldwin City, Kan. 66606.*

98. SHORTGRASS PRAIRIE. — **Location:** Colorado; Weld Co., 8 mi NNE of Nunn; 40°49'N, 104°55'W. Pawnee National Grassland Map. **Continuity:** Established 1972; 4 intermittent years. **Size:** 40.5 ha = 100 acres. **Description of Plot:** See AB 26:975-976 (1972). **Weather:** Temperatures below normal, precipitation above normal (one late snowstorm in May delayed counts). **Coverage:** May 26, 29; June 2, 9, 12, 16, 19, 22; 0510-0900, MDT. Total man-hours: 21. **Census:** Horned Lark, 26 (64, 26); McCown's Longspur, 19 (47, 19); Mourning Dove, 5 (12, 5), Mountain Plover, 3 (7, 3). **Total:** 4 species; 53 territorial males or females (131/km², 53/100 acres). **Visitors:** Pintail, Killdeer, C. Nighthawk, Barn Swallow, Lark Bunting. **Remarks:** 27 nests were found containing eggs or nestings: McCown's Longspur 12, Horned Lark 8, Mourning Dove 6, and Mountain Plover 1. Nesting success was 67% for McCown's Longspur; 50% Horned Lark; 50% Mourning Dove; 0% Mountain Plover. Linda Sweanor and Tom Olson assisted in nest searches. — *RONALD A. RYDER, Dept. of Fishery & Wildlife Biol., Colo. State Univ., Ft. Collins, Colo. 80523.*

99. MIXED HABITAT-DISTURBED BOTTOMLAND. — **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; 7 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 26:976-977 (1972). **Weather:** Mild; count days were clear to partly cloudy with temperature extremes of 52-90°F. **Coverage:** Apr. 15, 18, 27; May 2, 9, 16, 26, 31, June 9, 19, 24, 30; 0645-1145, CDT. Man-hours: 44. **Census:** Blue-gray Gnatcatcher, 15 (38, 16); Indigo Bunting, 15.5; Red-

winged Blackbird, 11 (27, 11), Cardinal, 10 (25, 10), Com Yellowthroat, 8 (20, 8), Yellow-billed Cuckoo, 6.5 (16, 7); Yellow-breasted Chat, 5 (12, 5); Brown-headed Cowbird, 5; Field Sparrow, 5; Ruby-throated Hummingbird, 4.5 (11, 5); Am. Goldfinch, 4 (10, 4); Red-headed Woodpecker, 3.5 (9, 4); E. Wood Pewee, 3.5; Red-eyed Vireo, 3.5; Red-bellied Woodpecker, 3 (7, 3); Downy Woodpecker, 3; Carolina Chickadee, 3; Painted Bunting, 3; Dickcissel, 3; Blue Jay, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 1.5; Brown Thrasher, 1.5; Bobwhite, 1; Barred Owl, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Acadian Flycatcher, 1; Rough-winged Swallow, 1; Gray Catbird, 1; Prothonotary Warbler, 1; N. Parula, 1; Kentucky Warbler, 1; Green Heron, 0.5; Red-shouldered Hawk, 0.5; Com. Flicker, 0.5; Pileated Woodpecker, 0.5; Orchard Oriole, 0.5; Summer Tanager, 0.5; E. Phoebe, +; Am. Robin, +; N. Oriole, +. **Total:** 42 species; 135.5 territorial males (335/km², 136/100 acres). **Visitors:** Little Blue Heron, Killdeer, Mourning Dove, Hairy Woodpecker, Com. Crow, Starling, Com. Grackle, Lark Sparrow. **Remarks:** The marsh contained several inches of water through the census period. The change from shrubby sprouts to young trees during the past seven years may account for the decline of the Com. Yellowthroat (16 in 1972, 8 in 1978) and the increase of the Blue-gray Gnatcatcher (8 in 1972, 15.5 in 1978). Absence of the Carolina Wren and E. Bluebird is probably a result of the severe winter. — *ELLA DELAP, 409 N. Wyandotte, Dewey, Okla. 74029.*

100. WOODLAND ALONG STREAM ON PRAIRIE. — **Location:** Kansas; Lyon Co., 3 mi NNE of Allen; 38°42'N, 96°09'W. **Continuity:** New. **Size:** 12.44 ha = 30.74 acres. **Description of Plot:** An elongated S shape following the meandering of 142 Mile Creek. It is a woodland community within a mile of the beginning of the stream. The dominant canopy trees in quantitative order are Black Walnut (*Juglans nigra*), Hackberry (*Celtis occidentalis*), and Green Ash (*Fraxinus pensylvanica*). Redbud (*Cercis canadensis*), Box-elder (*Acer negundo*), and Am. Elm (*Ulmus americana*) form the understory, though the latter two are not true understory trees. Rough-leaved Dogwood (*Cornus drummondii*) is common on a rocky slope. A large and often dense diversity of ground cover is present. Riverbank Grape, Buckbrush, Wild Gooseberry, Golden Currant, Bristly Greenbrier, Virginia Creeper, and Poison Ivy are all common. Pigweed, Ragweed, and Stinging Nettle are abundant herbs. In addition, grasses form an important part of the ground cover. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 307/acre; total basal area 179 ft²/acre. Species comprising 91% of the total number of trees [figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence]: Black Walnut, 63, 21, 24, 83; Hackberry, 55, 18, 16, 83; Green Ash, 40, 13, 15, 67; Kentucky Coffee-tree, (*Gymnocladia dioica*), 30, 10, 7, 83; Redbud, 18, 6, 4, 67; Am. Elm, 18, 6, 4, 67; Box-elder, 18, 6, 4, 33; dead trees, 37, 12, 16, 100. Other trees on the plots in descending quantitative order include Honey Locust (*Gleditsia triacanthos*), Basswood (*Tilia*

americana), Sycamore (*Platanus occidentalis*), Red Mulberry (*Morus rubra*), Osage Orange (*Maclura pomifera*), and, one species not found within any plot but within the study area, Cottonwood (*Populus deltoides*). Trees by diameter size class [figures after each size class give number of trees/acre, relative density (%), basal area (square feet/acre), relative dominance (%): A (3-6 in.) 165, 54, 54, 30, B (6-9 in.) 85, 28, 56, 31; C (9-12 in.) 23, 8, 20, 11; and (12-15 in.) 13, 4, 15, 8; D (15-21 in.) 12, 4, 18, 10; E (21-27 in.) 5, 2, 13, 7; F (27-33 in.) 2, 1, 4, 2. Shrub stems/acre 1985; ground cover 93%; canopy cover 70%; average canopy height 47.5 ft (range 25-70). **Edge:** Bordered on S and W by native Bluestem and mixed grass prairie. This range has not been burned in recent years and the edge is yielding to Sumac, Rough-leaved Dogwood, Honey Locust, and Green Ash saplings. Greater Prairie Chicken, Upland Sandpiper, Scissor-tailed Flycatcher and E. Meadowlark are the common birds on this grassland community. The plot is bordered on the N and E by farm land and pasture; this year it was planted to sorghum. **Topography:** Sloping gently to the SE. A portion of the W section, however, is a steep, rocky slope adjoining the grassland. **Elevation:** 1200-1250 ft. **Weather:** Very dry. June and July precipitation several inches below normal. The creek ran intermittently after June. **Coverage:** May 29; June 2, 10, 19, 23, July 1. Total man-hours: 15.75. **Census:** House Wren, 14 (113, 46); Indigo Bunting, 7 (56, 23); Yellow-billed Cuckoo, 6 (48, 20), Black-capped Chickadee, 6; Cardinal, 6, Brown-headed Cowbird, 5 (40, 16) (females), Great Crested Flycatcher, 4 (32, 13); Red-headed Woodpecker, 3 (24, 10); E. Wood Pewee, 3; Blue Jay, 3; Com. Crow, 3; Tufted Titmouse, 3; Bobwhite, 2 (16, 7); Com. Flicker, 2; Red-bellied Woodpecker, 2, Downy Woodpecker, 2; Blue-gray Gnatcatcher, 2; N. Oriole, 2; Mourning Dove, 1, White-breasted Nuthatch, 1; Rufous-sided Towhee, 1; Green Heron, +; Turkey Vulture, +; Red-tailed Hawk +; Great Horned Owl, +, Belted Kingfisher, +; Hairy Woodpecker, +, E. Phoebe, +; Willow Flycatcher, +; Red-eyed Vireo, +; Com. Yellowthroat, +. **Total:** 31 species; 78 territorial males or females (627/km², 254/100 acres). **Visitors:** Great Blue Heron, Com. Nighthawk, Rough-winged Swallow, Barn Swallow, Am. Robin, Field Sparrow. **Remarks:** Fledglings seen: Blue-gray Gnatcatcher. Nests found: Yellow-billed Cuckoo, Com. Flicker, Red-headed Woodpecker, E. Wood Pewee, and Com. Crow. Numerous dead stumps provide a suitable niche for a good population of Red-headed Woodpeckers. — *LARRY and CARLEEN HERBERT, Box 2, Allen, Kan. 66833.*

101. 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; 8 consecutive years. **Size:** 9.7 ha = 24 acres. **Description of Plot:** See AB 25:966-7 (1971). **Weather:** Drier than usual. **Coverage:** Feb. 25; Mar. 18, 24; Apr. 1, 15, May 4, 14, 24, 29; June 3, 10, 21, 24; July 1, 8, 22; 0530-1945 hours. Total man-hours: 39. **Census:** Great Blue Heron, 67 (690, 279), House Wren, 25 (257, 104); Com. Grackle, 10 (103, 42); Am. Robin, 9 (93, 37); Yellow War-

bler, 9, Starling, 8 (82, 33), Song Sparrow 7.5 (77, 31); Com. Yellowthroat, 7 (72, 29); Black-billed Magpie, 6 (62, 25); Mourning Dove, 5 (51, 21); N. Oriole, 4.5 (46, 19); Com. Flicker, 3 (31, 12); Downy Woodpecker, 3; Red-winged Blackbird, 2.5; Am. Kestrel, 2; E. Kingbird, 2; W. Meadowlark, 2; Lazuli Bunting, 2; Great Horned Owl, 1; Tree Swallow, 1; Gray Catbird, 1; Yellow-breasted Chat, 1; Am. Goldfinch, 1; Belted Kingfisher, +; Brown-headed Cowbird, +. **Total:** 25 species; 179.5 territorial males (1848/km², 748/100 acres). Excluding the colonial nesting herons, 112.5 territorial males (1158/km², 469/100 acres). **Visitors:** Black-crowned Night Heron, Canada Goose, Mallard, Ring-necked Pheasant, Com. Nighthawk, Black-capped Chickadee. **Remarks:** The grove retained its character from the last 2 years, except that in the S third, strong winds blew down a substantial number of the dead cottonwoods last December, so that this area turned into sort of a fallen log/grassland with only a few dead stubs. Only 2 wrens, a robin, a Starling and a Song Sparrow maintained territories in this section, plus a meadowlark that sang from peripheral trees. The heron population has increased 50% over last year, and 7-fold over the original 9 nests in 1971. The building, egg-laying, hatching, and fledging of the herons were staggered in time; 24 nests on April 1, 46 nests on April 15, and 67 nests on May 4. The area occupied by the herons likewise expanded, all of the new nests being built in live trees. Most species achieved densities slightly less than last year, except that Starling dropped from 12 to 8, yellowthroats from 12 to 6.5, and magpies increased from 2 to 6. The most interesting observation this year was of 4 grackle nests in the superstructures of heron nests, placed underneath to avoid interaction with the herons. We found 114 nests, including the 67 herons, 12 wrens, 10 grackles, 8 Starlings, 7 magpies, 4 robins, 3 orioles, 2 Downy Woodpeckers, and 1 kingbird. We estimated territorial males for herons, grackles, and Starlings as equal to the number of nests found. — *FRANK and JAN JUSTICE, HUGH (compiler) and URLING KINGERY, 869 Milwaukee Street, Denver, Colo. 80206.*

102. FLOODPLAIN COTTONWOOD FOREST. — **Location:** Colorado, Weld Co., on the W bank of the S. Platte River about 6 mi S and 1.5 mi E of Johnstown, extends from the confluence of the St. Vrain Creek and S. Platte River S about 0.7 mi. Parts of sec. 34 & 35, T4N, R67W, 40°21'N, 104°14'W, Milliken Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 52.2 ha = 128.9 acres. **Description of Plot:** See AB 27:997 (1973). **Weather:** Mostly clear, dry and warm throughout period. **Coverage:** May 14, 23, 30; June 6, 13, 20, 27; 0545-0910. Total man-hours: 15. **Census:** House Wren, 72 (138, 56); Starling, 36 (69, 28); Mourning Dove, 10 (19, 8); E. Kingbird, 10; Com. Yellowthroat, 8 (15, 6); Com. Flicker 7 (13, 5); N. Oriole, 5 (10, 4); Killdeer, 4 (8, 3); Yellow Warbler, 4; Red-winged Blackbird, 4; Am. Robin, 3 (6, 2); Song Sparrow, 3; Yellow-breasted Chat, 2; W. Meadowlark, 2; Brown-headed Cowbird, 2; Red-headed Woodpecker, 1; Mallard, 1; Spotted Sandpiper, 1; Black-capped Chickadee, 1; W. Wood Pewee, 1. **Total:** 20 species; 177 territorial (339/km², 137/100 acres). **Remarks:** Number of territorial males

increased by 8.6% over 1977. There was a large increase in House Wrens (24%) and a decrease in Starlings (20%). Numbers of other breeding birds were similar to 1977. The plot was established to evaluate the effects of the St. Vrain Nuclear Generating Station on the surrounding environment. The plant has been in operation only periodically in 1978 at very reduced capacity. — *LADISLAV R. HANKA, Dept. of Zool. and Ent., Colorado State Univ., Fort Collins, Colo., 80523.*

103. OREGON WHITE OAK FOREST. — **Location:** Washington; Thurston Co., 5 mi S on Case Road from Maytown Exit on Interstate 5; 46°49'N, 123°0'W, Tenino Quadrangle, USGS. **Continuity:** New. **Size:** 7.5 ha = 18.5 acres (rectangle, aerial photograph). **Description of Plot:** The dominant canopy tree is Oregon White Oak (*Quercus garryana*) with some Oregon Ash (*Fraxinus latifolia*) and Douglas-fir (*Pseudotsuga menziesii*). Most prominent in the understory are Indian Plum (*Osmaronia cerasiformis*), Snowberry (*Symphoricarpos albus*), Ocean Spray (*Holodiscus discolor*) and Oregon Grape (*Mahonia nervosa*). The ground cover is primarily grasses. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 5 circular samples, 328/acre; total basal area 109.5 ft²/acre. Species comprising 90% of the total number of trees: Oregon White Oak, 328, 100, 100, 100. Trees by diameter size class: A (3-6 in.) 108, 33, 10, 8, 4; B (6-9 in.) 84, 25, 25, 2, 10; C (9-15 in.) 82, 25, 65.6, 27; D (15-21 in.) 38, 12, 68.4, 28; E (21-27 in.) 10, 3, 31.0, 13; G (33-40 in.) 6, 2, 42.6, 18. Shrub stems/acre 24,600; ground cover 98%; canopy cover 71%; average canopy height 49 ft (range 23-75). **Edge:** Bordered on the N and S by grasslands, on the W by coniferous forest and on the E by a primary road. A stream runs along the S edge. **Topography:** Essentially flat. **Elevation:** 200 ft. **Weather:** Unusually wet during the early part of the period; clear and warm the latter

half. **Coverage:** Apr 3 7 11 15 18 21 May 1, 5, 9, 12, 17; June 5, 7, 15; between 0535-0820. Total man-hours: 17.5. **Census:** Song Sparrow, 8 (107, 43); Starling, 5 (67, 27); Rufous Hummingbird, 4 (53, 22); W. Wood Pewee, 4; Am. Robin, 4; Brown-headed Cowbird, 4 (females); Red-winged Blackbird, 3.5 (47, 19); Chestnut-backed Chickadee, 3 (40, 16); Com. Yellowthroat, 3; Rufous-sided Towhee, 3; Orange-crowned Warbler, 2.5; Downy Woodpecker, 2; Willow Flycatcher, 2; Black-capped Chickadee, 2; Brown Creeper, 2; Cedar Waxwing, 2; Purple Finch, 1.5; Am. Kestrel, 1; Com. Flicker, 1; Hairy Woodpecker, 1; *Empidonax* sp., 1; White-breasted Nuthatch, 1; Warbling Vireo, 1; Yellow Warbler, 1; N. Oriole, 1; Black-headed Grosbeak, 1; Dark-eyed Junco, 1; Chipping Sparrow, 1. **Total:** 28 species 66.5 territorial males or females (888/km², 359/100 acres). **Visitors:** Mallard, Red-tailed Hawk, Ruffed Grouse, Mourning Dove, Great Horned Owl, Pileated Woodpecker, Steller's Jay, Com. Crow, Bushtit, Red-breasted Nuthatch, Yellow-rumped Warbler, Wilson's Warbler, Evening Grosbeak, Am. Goldfinch. Seven nests were located: Com. Flicker, 1; Chestnut-backed Chickadee, 1; Brown Creeper, 1; Starling, 4. Special thanks to Christopher B. Chappell for assistance with the quantitative habitat description, and John R. Edwards for determining the acreage of the plot. — *RICHARD L. KNIGHT, Wash. Dept. of Game, 600 N. Capitol Way, Olympia, Wash. 98504.*

104. DECIDUOUS OAK WOODLAND. — **Location:** California; Monterey Co., Hastings Reservation, 2.5 mi E Jamesburg; 36°23'N, 121°33'W, Rana Creek Quadrangle, USGS. **Continuity:** New. **Size:** 5.67 ha = 14 acres (irregular, area surveyed with a hand-held compass and measured with steel tape). **Description of Plot:** The dominant canopy tree is Blue Oak (*Quercus douglasii*) with very little understory. The ground cover is a very diverse mixture of forbs and grasses. A quantitative survey of the vegetation gave the fol-



Census 103. Oregon White Oak Forest. Photo/R. L. Knight.

lowing results. Trees 4 cm diameter and over, based on five circular 0.1 acre circles, 268/acre, total basal area 71.7 ft²/acre. Living Blue Oaks comprised 95% of the total number of trees (248/acre, 95% rel. density, 99% rel. dominance, 100% frequency). Redberry (*Rhamnus crocea*), Honeysuckle (*Lonicera* sp.) and dead Blue Oaks comprised the remaining 5% of the trees. Trees by diameter size class (trees/acre, relative density, relative dominance, frequency): A (3-6 in.) 128, 63, 14, 100; B (6-9 in.) 40, 20, 13, 100; C (9-15 in.) 20, 10, 39, 60; D (15-21 in.) 10, 5, 20, 60; F (27-33 in.) 4, 2, 14, 20. Shrub stems/acre 236; ground cover 100%; canopy cover 44%; average canopy height 25 ft (range 17-30). **Edge:** Bordered by a narrow margin of similar habitat and then oak savanna and mixed evergreen forest. **Topography:** A N-facing slope (average 15°). **Elevation:** 1850-2000 ft. **Weather:** The rainfall during the winter of 1977-78 (35.5 in.) was 15.3 in. above the mean for the last 39 years at Reservation headquarters. The mean temperature in April and May (50.5° and 57.7°F respectively) are close to the mean April and May temperatures for the past 10 years (50.1° and 56.2° respectively). **Coverage:** Apr. 17, 20, 26, 28; May 6-7, 14, 20, 30; June 17; 8 trips 0640-1015; 2 trips 1000-1200. Total hours: 17. **Census:** Blue-gray Gnatcatcher, 4 (71, 29); Dark-eyed Junco, 2.5; Plain Titmouse, 2; Ash-throated Flycatcher, 1.5; Scrub Jay, 1; Chipping Sparrow, 1; Anna's Hummingbird, 0.5; Violet-green Swallow, 0.5; White-breasted Nuthatch, 0.5; W. Bluebird, 0.5; Hutton's Vireo, 0.5. **Total:** 11 species; 14.5 territorial males (256/km², 104/100 acres). **Visitors:** Mourning Dove, Com. Flicker, Nuttall's Woodpecker, Acorn Woodpecker, Hairy Woodpecker, W. Flycatcher, W. Wood Pewee, Com. Crow, House Wren, Bewick's Wren, Am. Robin, Warbling Vireo, Black-throated Gray Warbler, N. Oriole, Purple Finch, Pine Siskin, Lesser Goldfinch, Lawrence's Goldfinch. **Remarks:** Nests found: Plain Titmouse, 2; Blue-gray Gnatcatcher, 3. All gnatcatcher nests were destroyed, but new ones were built nearby and birds were observed carrying food late in the season. Special thanks to W. D. Koenig for assistance with mapping and quantitative habitat description. — PAMELA L. WILLIAMS, *Hastings Reservation, Univ. of Calif., Star Route Box 80, Carmel Valley, Calif. 93924.*

105. OAK WOODLAND. — **Location:** California; Sutter Co., along N drainage of North Butte in the Sutter Buttes, 2.6 mi SSE of Pennington; 39°15'N, 121°46'W, Pennington Quadrangle, USGS. **Continuity:** New. **Size:** 16.0 ha = 39.5 acres (square; paced with compass). **Description of Plot:** Rolling hills clothed with open stands of Blue (*Quercus douglasii*) and Interior Live Oaks (*Q. wislizenii*). Two vernal creeklets drain the plot, they ceased to flow by the end of April, but still held pools of water at the end of May. On the relatively dry slopes above the creeklets, oaks are dispersed in very open groves. Large Manzanita (*Arctostaphylos manzanita*) shrubs are scattered on W-facing slopes. Denser groves of Live Oaks, festooned with Poison Oak (*Toxicodendron diversiloba*), Dutchman's Pipe (*Aristolochia californica*) vine and Virgin's Bower (*Clematis ligusticifolia*), line the moister banks along the creeklets. Annual grasses and forbs form an herbaceous under-

story almost throughout the plot. Many of the oaks are parasitized by the mistletoe *Phoradendron flavescens*. **Edge:** Bordered by similar habitat. About 0.3 km to the S a permanent watering trough has been developed for use by livestock, and is frequently utilized by granivorous birds. **Elevation:** 110-340 ft. **Weather:** Above average precipitation during the preceding growing season (October-April) promoted plant growth. **Coverage:** Apr. 5, 16, 23, 30; May 7, 23; 0600-1300, PDT. Total man-hours: 24. **Census:** Plain Titmouse, 8 (50, 20); House Finch, 6 (38, 15); Bewick's Wren, 5 (31, 13); Ash-throated Flycatcher, 3.5 (22, 9); Mourning Dove, 3 (19, 8); Lesser Goldfinch, 3; Nuttall's Woodpecker, 2; W. Kingbird, 2; Scrub Jay, 2; Mockingbird, 2; Brown-headed Cowbird, 2; Lawrence's Goldfinch, 2; Anna's Hummingbird, 1.5; Acorn Woodpecker, 1.5; Phainopepla, 1.5; Blue-gray Gnatcatcher, 1; California Quail, +; N. Oriole, +; Brown Towhee, +. **Total:** 19 species; 46 territorial males or females (288/km², 116/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Great Horned Owl, Violet-green Swallow, Starling, Lark Sparrow. **Remarks:** Nests found or fledglings observed: Mourning Dove, Nuttall's Woodpecker, Ash-throated Flycatcher, Plain Titmouse, Bewick's Wren. Goldfinch and cowbird densities were difficult to determine due to lack of clearly defined territorial behavior; the figures are educated guesses. Thanks to Pacific Gas and Electric Company for funding the research. — DAVID GAINES, *P.O. Box 2764, Oakland, Calif. 94602.*

106. OAK WOODLAND. — **Location:** California; Riverside Co., 7 mi NE of San Juan Capistrano on Ortega Highway (74); within Cleveland Nat'l Forest, in the vicinity of Oak Flats; 33°33'30"N, 117°26'35"W. **Continuity:** New. **Size:** 8.09 ha = 20 acres. **Description of Plot:** An L-shaped patch of forest on E and N facing slopes surrounding Serrano Spring. One small stream ran diagonally across the plot. There were a few grassy breaks. A southern oak woodland community dominated by Coast Live Oak (*Quercus agrifolia*). Scrub Oak (*Q. dumosa*) was also present, together with scattered Walnut (*Juglans californica*). The understory was composed predominantly of Squaw Bush (*Rhus trilobata*), Lemonadeberry (*R. integrifolia*), and Christmasberry (*Heteromeles arbutifolia*). This assemblage covered more than 75% of the plot. **Edge:** Surrounded on all sides by open grassland. Nearby to the E and W is coastal chaparral. **Weather:** Warm, mostly sunny, with occasional cloud cover. Temperature range: 63-76°F. **Coverage:** May 19-26; 0530-1005 hours. Total hours: 15. **Census:** Ash-throated Flycatcher, 4 (49, 20); Acorn Woodpecker, 2; Western Flycatcher, 2; Plain Titmouse, 2; Rufous-sided Towhee, 2; Brown Towhee, 2; Anna's Hummingbird, 1; Nuttall's Woodpecker, 1; Com. Crow, 1; Wrentit, 1; Bewick's Wren, 1; Ruby-crowned Kinglet, 1. **Total:** 12 species; 20 territorial males (247/km² and 100/100 acres). **Visitors:** Calif. Quail, Mourning Dove, Scrub Jay, Com. Bushtit and Calif. Thrasher. **Remarks:** The area is closed to the public. Despite this, it is traversed at times by off-road vehicles. In addition to this disturbance, the area is grazed. This patch of forest is surrounded on all sides by grassland and since it possesses water, it is visited by species more

typical of grassland or chaparral. This edge effect was reduced some by using an area of 20 continuous acres. — MARK GODSEY, 757 Loma Vista Drive, Long Beach, CA 90813.

107. OAK WOODLAND. — **Location:** California; Orange Co., 21.6 mi E of San Juan Capistrano on Hwy. 74, left on 6S05 to Blue Jay Campground, in 2.5 mi on the San Juan Trail to the Chiquita Basin; T6S, R6W, Alberhill Quadrangle, USGS. **Continuity:** New. **Size:** 16 ha = 39.54 acres (400 × 400 m, measured). **Description of Plot:** The canopy consists of Coast Live Oak (*Quercus agrifolia*) and Engelmann Oak (*Q. engelmannii*). The understory consists of Coast Live Oak saplings, Buckthorn (*Rhamnus ilicifolia*), Laurel Sumac (*Rhus laurina*), Scrub Oak (*Q. dumosa*), White Sage (*Salvia apiana*), Manzanita (*Arctostaphylos glandulosa*), and Toyon (*Heteromeles arbutifolia*). The ground cover is dominated by Mint (*Satureja chandleri*), Poison Oak (*Toxicodendron diversiloba*), Bedstraw (*Galium aparine*), and Wild-hyacinth (*Dichelostemma pulchella*). A quantitative vegetational survey gave the following results: Trees 3-in. diameter and over, based on 80 10 m² samples, 101 trees/acre; total basal area 161.74 ft²/acre. Canopy species (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence) Coast Live Oak 99, 98, 99.5, 85; Engelmann Oak 2, 2, 0.5, 3.8. Trees by diameter size class A (3-6 in.) 21.8, 21.5, 1.3, 28.8; B (6-9 in.) 21.8, 21.5, 4, 35; C (9-15 in.) 35.9, 35.5, 17.7, 55, D (15-21 in.) 15.7, 15.5, 17.4, 31.2; E (21-27 in.) 3, 3, 5.8, 7.5; F (27-33 in.) 0.5, 0.5, 1.5, 1.2, G (33-40 in.) 1.5, 1.5, 6.6, 3.8; H (40+ in.) 1, 1, 45.3, 5. Ground cover 70%; canopy cover 80%, average canopy height 35 ft. There are two small meadows (50 × 100 m) at the N end of the plot. **Edge:** The woodland areas are limited to the canyon bottoms and moister hillsides. Surrounded by similar woodland, the basin area is surrounded by both Chaparral and Coastal Sage Communities. A large meadow (100 × 200 m) lies at the S edge. **Topography:** Both hilly and flat. **Elevation:** 2800 ft. **Weather:** Relatively hot, with no precipitation. **Coverage:** May 13-20; between dawn and 1100 hours. Total man-hours: 64. **Census:** Plain Titmouse, 14 (87, 35); House Wren, 13 (81, 33); California Quail, 7 (44, 18), Black-headed Grosbeak, 6 (37, 15); Anna's Hummingbird, 4 (25, 10); Ash-throated Flycatcher, 4; Hutton's Vireo, 3 (19, 8), Brown-headed Cowbird, 3 (females); Wrentit, 2; Orange-crowned Warbler, 2; Bushtit, 1, Bewick's Wren, 1; Blue-gray Gnatcatcher, 1, N. Oriole, 1; House Finch, 1; Brown Towhee, 1; Great Horned Owl, +. **Total:** 17 species, 64 territorial males or females (400/km², 162/100 acres). **Visitors:** Mourning Dove, Com. (Red-shafted) Flicker, Nuttall's Woodpecker, *Empidonax* Flycatcher, W. Wood Pewee, Scrub Jay, White-breasted Nuthatch, Bewick's Wren, Ruby-crowned Kinglet, Townsend's Warbler, Wilson's Warbler, W. Tanager, House Finch, Lesser Goldfinch. **Remarks:** 14 nests were located: Plain Titmouse, 8; Anna's Hummingbird, 2; Bushtit, 1; House Wren, 1, Blue-gray Gnatcatcher, 1; Hutton's Vireo, 1. The breeding period for the species in this area varies greatly, many having fledged young while others were just beginning to construct nests. Rufous-sided Towhee were com-

mon but displays of territorial behavior were weak, perhaps indicating young were fledged and territories had begun breaking down. Only 2 male and 2 nesting female Anna's Hummingbirds were identified although many hummingbirds were seen. Bushtits foraged in groups of more than 2; presumably the young had fledged and were traveling with the parents. House Finches were feeding fledglings. Acorn Woodpeckers were seen in groups which fluctuated from 2 to 12; there was no discernable grouping into family units and nesting had probably not yet begun. A special thanks to the U.S. Forest Service for the opportunity and assistance provided to do this study. — MARY ANN MAY and PAULA J. PETERS, 407 East 61st Street, Long Beach, Calif. 90805.

108. OPEN ASPEN GROVE - SCATTERED CONIFERS. — **Location:** Colorado; Larimer Co., Rocky Mtn. Nat'l Park, NE 1/4, Sec 31, T5N, R73W. **Continuity:** Established 1976; 3 consecutive years. **Size:** 14 ha = 34.6 acres. **Description of Plot:** See AB 31:72-3 (1977). **Weather:** Late, wet spring. **Coverage:** May 21, 28; June 11, 17, 25; July 4, 9; 0630-1100. Total man-hours: 27. **Census:** Tree Swallow, 10 (71, 29); House Wren, 9 (64, 26); Warbling Vireo, 5 (36, 14); W. Wood Pewee, 4 (29, 12); Williamson's Sapsucker, 3 (21, 9); Dusky Flycatcher, 3; Mountain Chickadee, 3; Am Robin, 3; Mountain Bluebird, 3; Com. Flicker, 2; Pygmy Nuthatch, 2; Green-tailed Towhee, 2; Chipping Sparrow, 2; Broad-tailed Hummingbird, 1.5; Hairy Woodpecker, 1.5; W Tanager, 1.5; Gray-headed Junco, 1.5; Yellow-bellied (Red-naped) Sapsucker, 1; Yellow-rumped Warbler, 1; Evening Grosbeak, 1; Cassin's Finch, 1; Pine Siskin, 1; Lincoln's Sparrow, 1; Olive-sided Flycatcher, 0.5; Goshawk, +; Steller's Jay, +; Brown Creeper, +, Ruby-crowned Kinglet, +; Solitary Vireo, +, Brown-headed Cowbird, +. **Total:** 30 species; 63.5 territorial males (453/km², 184/100 acres). **Remarks:** 41 nests located. Increased winter and spring moisture had a definite impact on the area: overall nest density was greater; a lake that attracted a pair of Mallards and several Violet-green Swallows (neither bred there) existed until it dried up in the middle of June; Lincoln's Sparrows reappeared to breed for the first time in 4 years. — PAULA L. HANSLEY, 750 South 41st, Boulder, Colo. 80303.

109. PONDEROSA PINE - SCRUB OAK - MAHOGANY WOODLAND. — **Location:** Colorado; Douglas Co., 1 mi E of Franktown, on Highway # 86; 39°20'N, 104°40'W, Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 11 consecutive years. **Size:** 8.09 ha = 20 acres. **Weather:** It was a very hot summer. On Aug. 18 we had our 40th day of 90°F and over; normal for the summer is 35 days. **Coverage:** June 8, 16, 19, 23; July 1, 7, 16, 24; Aug. 1, 9, 12, 16, 23; 0800-2030 hours. Total man-hours: 65. **Census:** W. Bluebird, 12 (148, 60); Broad-tailed Hummingbird, 2; W. Wood Pewee, 2; Mountain Chickadee, 2; Solitary Vireo, 2; Black-headed Grosbeak, 2; Lesser Goldfinch, 2; Rufous-sided Towhee, 2; White-breasted Nuthatch, 1; Virginia's Warbler, 1; Brown-headed Cowbird, 1 (female); W Tanager, 1. **Total:** 12 species; 30 territorial

males or females (371/km², 150/100 acres) **Visitors:** Cooper's Hawk, Mourning Dove, Com. Nighthawk, Rufous Hummingbird, Com. Flicker (Red-shafted), Hairy Woodpecker, Steller's Jay, Scrub Jay, Com. Crow, Black-capped Chickadee, Pygmy Nuthatch, House Wren, Am. Robin, House Finch, Red Crossbill, Lark Sparrow. **Remarks:** There were 16 nest boxes, used by W. Bluebirds (12); Mountain Chickadee (3); and White-breasted Nuthatch (1). — MILDRED O. SNYDER, 161 Del Mar Circle, Aurora, Colo. 80011.

110. SPARSE PINE - FIR - ASPEN WOODLAND. — **Location:** Utah, Washington Co., Zion Nat'l Park, Lava Point; 37°23'N, 113°1'20'W (W center at NW corner Sec. 31, T39S, R10W, Salt Lake B&M); Zion Nat'l Park Topographic Map (Zion Canyon Section), USGS. **Size:** 16 ha = 39.54 acres (100 m. squares, paced). **Continuity:** New. **Topography:** A level mesa, with lava cliffs and talus slopes N, S and SW of the plot. **Elevation:** 7890 ft. **Description of Plot:** Soil: Heavy loam, averaging less than 1/3 m deep on lava bedrock. Mixed Ponderosa Pine (*Pinus ponderosa*) and White Fir (*Abies concolor*) form a thinly scattered woodland, with large clearings covered with sapling Gambel Oaks (*Quercus gambelii*) and stunted Big Sagebrush (*Artemisia tridentata*); there are a few patches of Quaking Aspen (*Populus tremuloides*), and an occasional oak reaches tree size. Trees 8 cm diameter and over, based on 10 circular samples, 10.1/ha, total basal area 1.2 m²/ha. Species comprising 100% of the total number of trees (figures after each give the total number of trees/ha, relative density (%), relative dominance and frequency): Ponderosa Pine 3.3, 33, 39, 70; White Fir 3.3, 33, 25, 60; Quaking Aspen 2.3, 23, 32, 20; dead trees 0.8, 8, 4, 50; Gambel Oak 0.4, 4, 1, 20. Trees by diameter size class (figures after each class give number of trees/ha, relative density (%), basal area in m²/ha and relative dominance): A (8-15 cm) 2, 20, 0.01, 1; B (15-23 cm) 2.5, 25, 0.06, 5; C (23-38 cm) 3, 30, 0.22, 18; D (38-53 cm) 1.1, 11, 0.43, 37; E (53-68 cm) 0.8, 8, 0.22, 18; F (68-83 cm) 0.4, 4, 0.17, 14; G (83-100 cm) 0.1, 1, 0.08, 7; H (100+ cm) 0. Canopy cover, 7%; average canopy height 8.5 m (range 5-15); ground cover 16%; shrub stems 1072/ha, with sapling oaks 45%, sagebrush 29%, Buckbrush (*Ceanothus fendleri*) 19% and Greenleaf Manzanita (*Arctostaphylos patula*) 7%; average shrub height 0.5 m. A dirt road runs eastward through the center of the plot. **Edge:** Bordered on the E, N and NW by similar vegetation, with oaks and aspens more numerous; on the S and SW a lava-boulder field has no vegetation. **Weather:** Following a winter of above average snowfall, only 0.16 in. of rain fell during the census period. **Coverage:** June 4, 11, 18, 25; July 2, 4, 9, 16, 23-24; 0600-1145, MDT. Total man-hours: 26. **Census:** Green-tailed Towhee, 4 (25, 10); Vesper Sparrow, 4; Gray-headed Junco, 4; Steller's Jay, 3 (19, 8); Mountain Chickadee, 3; Townsend's Solitaire, 3; Cassin's Finch, 3; Broad-tailed Hummingbird, 2; Com. Flicker, 2; White-breasted Nuthatch, 2; Am. Robin, 2; W. Bluebird, 2; Mourning Dove, 1; Downy Woodpecker, 1; W. Wood Pewee, 1; Olive-sided Flycatcher, 1; Hermit Thrush, 1; Yellow-rumped Warbler, 1; Rufous-sided Towhee, 1; Great Horned

Owl, + **Total:** 20 species, 41 males and female hummingbirds (256/km², 104/100 acres) **Visitors:** White-throated Swift, Violet-green Swallow, Lincoln's Sparrow. **Remarks:** Swifts and swallows regularly fed along the cliffs and over the S and W boundaries. The Great Horned Owls occupied a nest just to the N that was used last year by Red-tailed Hawks. On June 18 the partly eaten carcass of a Spotted Owl was found on the ground below the owls' nest. — JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767.

111. RIPARIAN WOODLAND - LIVE OAK - JUNIPER. — **Location:** Arizona, Cochise Co., 3 mi SW of Portal, extending 0.5 mi along Cave Creek of the Chiricahua Mountains from bridge at Stewart Forest Service Camp upstream to N boundary of Sunny Flat Camp; 31°54'N, 109°10'W, Portal Quadrangle, USGS. **Continuity:** New. **Size:** 9.16 ha = 22.5 acres (surveyed by compass and tape; irregular rectangle following streambed (1960 ft in length and from 680-320 ft in width). **Description of Plot:** A rich biological area following the canyon with a paved road on one side of the creek and a trail along the other. **Vegetation:** The dominant trees are Arizona Sycamore (*Platanus wrightii*) Live Oaks (*Quercus emoryi* and *arizonica*), and Alligator Juniper (*Juniperus deppeana*). A large variety of shrubs and small trees comprise the understorey; most prominent are Willow (*Salix* sp.), *Mimosa biuncifera*, Silverleaf Oak (*Q. hypoleucoides*), Skunk Bush (*Rhus trilobata*), False Indigo (*Amorpha fruticosa*), and Grape (*Vitis arizonica*). The ground cover is mainly grass, which grows after the rains start in July. Pinyon Rice Grass (*Piptochaetium fibriatum*), Plains Love Grass (*Eragrostis intermedia*), Side Oaks Grams (*Bouteloua curtipendula*), and abundant along the creek bank is White Sweet Clover (*Melilotus albus*). A quantitative survey of the vegetation gave the following results: Trees 3-in. and over in diameter, based on five 0.1-acre circular samples, 282/acre; total basal area 298.4 ft²/acre. Species comprising 83% of the total trees [figures after each give number trees/acre, relative density (%), basal area in square ft/acre, relative dominance (%): Sycamore 72, 26, 51.8, 35; oak 66, 23, 37.2, 25; Alligator Juniper 80, 28, 35.2, 24. Trees by diameter size class [figures after each class give number trees/acre, relative density (%), basal area in ft²/acre, relative dominance (%): A (3-6 in.) 94, 33, 9.4, 3; B (6-9 in.) 64, 23, 19.2, 6; C (9-15 in.) 68, 24, 54.4, 18; D (15-21 in.) 30, 11, 54, 18; E (21-27 in.) 8, 3, 24.8, 10; F (27-33 in.) 12, 4, 58.8, 20; G (33-40 in.) 4, 3, 28.4, 10; H (over 40 in.) 4, 3, 50, 17 (two at 50 in. est.). Ground cover 50%; canopy cover 69%; average canopy height 60 ft (range 50-70 ft). **Edge:** A steep hillside forms the NW boundary. On the S the edge of the canyon is adjacent and steep at places, but otherwise an Oak-Juniper forest extends away from the plot. **Topography:** Alluvial fill with boulders and large rocks, topsoil 1-2 in. and deeper leaf cover in spots. **Elevation,** 4800 ft. **Weather:** Extremely dry. Summer rains normally start between July 4 and 10, but there were only two light showers until July 22. The creek was completely dry July 4-23. The situation was critical and all water was turned off in the campgrounds because the water level was very low at the

source Temperatures were very hot, 56°-96°F
Coverage: May 25-26, June 4, 9, 11, 16, 20, 26, July 3-5, 12, 24; 0600-1100, 1500-1700. Total: 40 man-hours. **Census:** W. Wood Pewee, 13 (143, 58); Rufous-sided Towhee, 10 (110, 44); White-breasted Nuthatch, 8 (88, 36); Bridled Titmouse, 7.5 (82, 33); Black-chinned Hummingbird, 7 (77, 31); Acorn Woodpecker, 7; Arizona Woodpecker, 6 (66, 27); Bewick's Wren, 6; Hutton's Vireo, 6; Black-throated Gray Warbler, 6; Wied's Crested Flycatcher, 5 (55, 22); Olivaceous Flycatcher, 5; Lucy's Warbler, 5; Painted Redstart, 5; Solitary Vireo, 4.5 (49, 20); House Finch, 4 (44, 18); Blue-throated Hummingbird (female), 3 (33, 13); Bushtit, 3; Brown Creeper, 3; Canon Wren, 2.5; Com. Flicker, 2; Cassin's Kingbird, 2; Mexican Jay, 2; Am. Robin, 2; Grace's Warbler, 2; Hepatic Tanager, 2; Scott's Oriole, 1.5; Cooper's Hawk, 1; White-winged Dove, 1; Rivoli's Hummingbird (female), 1; Coppery-tailed Trogon, 1; Hermit Thrush, 1; Bronzed Cowbird (female), 1; Black-headed Grosbeak, 1; Sulphur-bellied Flycatcher, +; W. Tanager, +. **Total:** 36 species; 137 territorial males or females, (1505/km², 609/100 acres). No census was taken at night, but the following were heard: Whiskered Owl, Spotted Owl and Whip-poor-will **Visitors:** Band-tailed Pigeon, Mourning Dove, White-throated Swift, Ash-throated Flycatcher, Black Phoebe, Violet-green Swallow, Com. Raven, Summer Tanager and Rufous-crowned Sparrow. **Remarks:** The number of Lucy's Warblers was surprisingly high, at least more than expected from past experience. The Lesser Goldfinch, which may be expected to arrive for nesting about July 10, had not appeared by the last census trip on July 24, perhaps due to the long dry period. Non-territorial Brown-headed Cowbirds were seen and heard, but as they wander up and down the canyon, multiple registration could hardly be avoided and, therefore, no attempt was made to estimate the population of these birds. There is a noticeable increase in use for recreational purposes-camping, hiking, etc. Special thanks to S. M. Russell for his direction and help, and to Ruth R. Ogden and Pete Rawdon. — HARRIETTE W. BARKER, 5302 S. Missiondale Road, Tucson, Ariz. 85706.

112. PINYON-JUNIPER-PONDEROSA PINE ECOTONE. — **Location:** New Mexico, McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; SE, Sec 34, T13N, R13W; 35° 19'N, 108° 12'W, Pine Canyon Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 15.0 ha = 36.9 acres. **Description of Plot:** This plot is a portion of the plot described in AB 32:89 (1978). The vegetation is mature pinyon-juniper woodland with scattered patches of young Ponderosa Pines and occasional emergent ponderosa snags. **Edge:** Similar vegetation on all sides. **Topography:** Flat, the boundary of the plot is the rim of a low mesa. **Elevation:** 7560-7620 ft (2304-2323 m) **Weather:** See Census 117. **Coverage:** Apr 24-25; May 21-25, 30-31; June 4-6, 9, 14-18, 21-22, 24, 26; July 1, 3-5, 13, 21, 29; 0400-2100, MST. Total man-hours: 53. **Census:** Gray Flycatcher, 6 (40, 16); Violet-green Swallow, 5.5 (37, 15); Mountain Chickadee, 4 (27, 11); Pygmy Nuthatch, 4; W. Bluebird, 2.5; Ash-throated Flycatcher, 2; Steller's Jay, 2; Plain Titmouse, 2; Solitary Vireo, 2;

Black-throated Gray Warbler, 2, Screech Owl, 1, Flammulated Owl, 1, Com Night-hawk, 1; Com. Flicker, 1; Hairy Woodpecker, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Brown-headed Cowbird, 1; Chipping Sparrow, 1. **Total:** 19 species; 41 territorial males or females (275/km², 111/100 acres). **Visitors:** Turkey Vulture, Am. Kestrel, Mourning Dove, Great Horned Owl, Long-eared Owl, Broad-tailed Hummingbird, Say's Phoebe, W. Wood Pewee, Purple Martin, Piñon Jay, Bushtit, Hermit Thrush, Grace's Warbler, Rufous-sided Towhee. **Remarks:** Nests found, 7: Mountain Chickadee, 3; Violet-green Swallow, 2; Com. Flicker and Ash-throated Flycatcher, 1 each. A Solitary Vireo was seen feeding a recently fledged Brown-headed Cowbird. Two Chipping Sparrow nests immediately outside the plot were also parasitized. Mourning Doves were rare in the area this summer. — D. ARCHIBALD McCALLUM, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323.

113. RIVER FALLS AND WESTERN RED CEDAR - DOUGLAS-FIR FOREST. — **Location:** Montana; Lincoln Co.; between the Kootenai River and U.S. Highway #2, about 19 km WNW of Libby; 48°27'N, 115°47'W, Kootenai Falls Quadrangle, USGS. **Continuity:** New. **Size:** 44.5 ha = 110 acres (oblong, paced). **Description of Plot:** Approximately 40% is water, including a 1500 m stretch of the Kootenai River. Kootenai Falls is located in this stretch, and river elevation drops 17 m between the E and W edges of the plot. Flows of the Kootenai River are controlled by the pattern of discharge from Libby Dam (located approximately 40 km), and varied from 113 m³/sec to 566 m³/sec during the study. Width of the river was approximately 250 m at its widest point and 45 m at its narrowest, where it flows through a steep, rocky canyon. A number of islands immediately below the falls and all water areas to the N of them, were excluded. A footbridge spans the river at its narrowest point, approximately 500 m from the W boundary. The land area included is between the S bank of the Kootenai River and U.S. Highway #2 to the S (300 m by 70 m). A two-track Burlington Northern railroad, roughly bisecting this land area lengthwise, was used by approximately one train/hour during census runs. A telephone line and a 34.5 kilovolt powerline parallel this railroad, resulting in a cleared corridor roughly 40 m in width. Most of the remainder of the plot is forested. A picnic area is located along Hwy 2 near the center of the plot, and a 150 m loop road enters from Highway 2, 300 m from the E edge. Both areas were heavily used by people throughout the summer. An abandoned forest road connects U.S. 2 and the railroad right-of-way near the E edge. At the W edge, the highway, railroad, and telephone lines come together at the base of a steep, rocky cliff, and pass over a nearly vertical concrete embankment which extends to the riverbank. Rocky outcrops are common within the plot N of the railroad right-of-way. A number of very small streams bisect the plot. Elevations range from 588 to 640 m. A fairly steep bank rises between the railroad right-of-way and the relatively flat bench to the S in the E 2/3 of the plot. Forests to the N of this bank are fairly open and shrubby, with few large trees; forests

to the S are much more dense, with many tall trees and little understory vegetation. The plot falls primarily within the W. Red Cedar/Queencup Beadlily (*Thuja plicata/Clintonia uniflora*) habitat type, although a gradation to the Douglas-fir/Ninebark (*Pseudotsuga menziesii/Physocarpus malveceus*) habitat type is indicated along drier, exposed ridges near the water's edge. The dominant canopy trees are Douglas-fir, W. Larch (*Larix occidentalis*), and W. Red Cedar, and the most prominent shrubs are Canadian Buffaloberry (*Shepherdia canadensis*), Choke Cherry (*Prunus virginiana*), Com. Snowberry (*Symphoricarpos albus*), Creambush Ocean-spray (*Holodiscus discolor*), Elderberry (*Sambucus* spp.), Mountain Alder (*Alnus incana*), Ninebark, Quaking Aspen (*Populus tremuloides*), Red-osier Dogwood (*Cornus stolonifera*), Redstem Ceanothus (*Ceanothus sanguineus*), Rocky Mountain Maple (*Acer glabrum*), Syringa (*Philadelphus lewisii*), Thimbleberry (*Rubus parviflorus*), W. Serviceberry (*Amelanchier alnifolia*), and Willow (*Salix* spp.). Much of the more densely forested portion S of the railroad tracks has little or no ground cover, and the soil is covered with a mat of needles with scattered logs and branches. A quantitative survey of the vegetation gave the following results: trees, 3 in. (= 7.6 cm) diameter and over, based on five 0.1 acre (= 0.04 ha) circular samples, 2421/ha (= 980/acre); total basal area 37 m²/ha (= 160.1 ft²/acre). Species of trees (figures after each give number of trees/ha, number of trees/acre, relative density (%), relative dominance, and frequency, in that sequence): Douglas-fir 760, 338, 34, 48, 100, W. Larch 716, 318, 32, 27, 100; W. Red Cedar 414, 184, 19, 13, 80; Lodgepole Pine (*Pinus contorta*) 86, 38, 4, 5, 40; Water Birch (*Betula occidentalis*) 158, 70.7, 3, 80; Rocky Mountain Maple 9, 4, tr (= trace, or less than 0.5%), tr, 20; Ponderosa Pine (*P. ponderosa*) 5, 2, tr, tr, 20; Rocky Mountain Juniper (*Juniperus scopulorum*) 5, 2, tr, tr, 20. A few small Engelmann spruce (*Picea engelmannii*), W. Hemlock (*Tsuga heterophylla*) and Grand Fir (*Abies grandis*) were also found. Trees by diameter size class (figures after each class give number of trees/ha, number of trees/acre, relative density (%), basal area in m²/ha, basal area in ft²/acre, relative dominance) A (8-15 cm = 3-6 in.) 1278, 568, 58, 13.0, 56.8, 18; B (15-23 cm = 6-9 in.) 540, 240, 24, 16.5, 72.0, 23; C (23-38 cm = 9-15 in.) 315, 140, 14, 25.7, 112.0, 35; D (38-53 cm = 15-21 in.) 41, 18, 2, 7.4, 32.4, 10; E (53-69 cm = 21-27 in.) 27, 12, 1, 8.5, 37.2, 12; F (69-84 cm = 27-33 in.) 5, 2, tr, 2.3, 9.8, 3. Shrub stems/ha, 5265, shrub stems/acre, 2340; ground cover 26%, canopy cover 66%; average canopy height 22 m = 72 ft (range 18-30 m = 60-100 ft). **Edge:** Bordered on the N by the steep north bank of the Kootenai River and the slopes of the Purcell Mountains, characterized by Douglas-fir/Ninebark forests and relatively dry rocky outcrops, bordered to the S by U.S. 2, S of which rise the lower slopes of the Cabinet Mountains, characterized by the relatively moist W. Red Cedar/Queencup Beadlily and W. Hemlock/Queencup Beadlily habitat types. A steep, rocky cliff rises above the highway just S of the W third of the plot. **Weather:** Spring was relatively moist following a severe winter; plant phenology was thus several days behind normal. Rain was occasionally experienced during census runs, but

weather for the most part was clear to cloudy and dry. **Coverage:** May 7-9, 22, 25, June 5-9, 29-30; 0515-2130 hours. Total man-hours: 34 6. **Census:** Violet-green Swallow, 12 (27, 11), Yellow-rumped Warbler, 7 (16, 6); Golden-crowned Kinglet, 6 (13, 5); Swainson's Thrush, 5.5 (12, 5); Townsend's Warbler, 5.5 (12, 5); Am. Robin, 4.5 (10, 4); Yellow Warbler, 4.5; Dark-eyed Junco, 4.5; Rough-winged Swallow, 4 (9, 4); Dipper, 4; Red-eyed Vireo, 4; Black-capped Chickadee, 3.5 (8, 3); Song Sparrow, 3.5; Mallard, 2; Warbling Vireo, 2; Nashville Warbler, 2; MacGillivray's Warbler, 2; Am. Redstart, 2; Brown-headed Cowbird, 2; Pine Siskin, 2; Spotted Sandpiper, 1.5; Harlequin Duck, 1; Am. Kestrel, 1, Com. Flicker, 1; *Empidonax* Flycatcher (Hammond's or Dusky), 1; Tree Swallow, 1; Com. Crow, 1; W. Tanager, 1; Com. Goldeneye, +; Com. Merganser, +; Osprey, +; Com. Raven, +; Varied Thrush, +. **Total:** 33 species; 91 territorial males or females (204/km², 83/100 acres). **Visitors:** Canada Goose, Am. Wigeon, Barrow's Goldeneye, Mourning Dove, Rufous Hummingbird, Calliope Hummingbird, Belted Kingfisher, Hairy Woodpecker, Willow Flycatcher, Townsend's Solitaire, Cedar Waxwing, Orange-crowned Warbler, Lazuli Bunting, Lincoln's Sparrow. **Remarks:** Five nests were located: robin, 2, Com. Flicker, 1; Tree Swallow, 1; Black-capped Chickadee, 1. Although Pileated Woodpeckers were not observed during the census, one was seen on February 9 and feeding excavations were fairly common in old-growth W. Red Cedar. At least 7 Harlequin Ducks were present; these appeared to represent 1 pair, 1 lone female, and 4 bachelor males. Of the 33 breeding species encountered, the following were restricted to the Kootenai River and/or its shores: Mallard, Com. Goldeneye, Harlequin Duck, Com. Merganser, Spotted Sandpiper, and Dipper. The remaining species, with the exception of the swallows, were primarily restricted to terrestrial habitats, which comprised only 60% of the plot. More meaningful density estimates for these species in terrestrial habitats may thus be obtained by multiplying the density figures reported above by 1.67. The Varied Thrush, Golden-crowned Kinglet, Townsend's Warbler, Yellow-rumped Warbler, and W. Tanager occupied primarily tall, dense W. Red Cedar and Douglas-fir forests south of the railroad right-of-way; the Warbling Vireo, Yellow Warbler, MacGillivray's Warbler, and Song Sparrow occupied open, shrub-dominated habitats along the right-of-way. This study was part of a wildlife inventory related to a proposed hydroelectric facility, and was funded by Northern Lights, Inc. Thanks are extended to P. Ames, G. Joslin, and S. Thompson for their assistance with the study. — *L. S. THOMPSON, Montana Dept. of Natural Resources and Conservation, 32 South Ewing, Helena, Mont. 59601.*

114. COTTONWOOD RIVERBOTTOM - PASTURE. — **Location:** Colorado; Weld Co., about 6 mi S and 1 mi E of Johnstown; S3, T3N, R67W; 40°14'N, 104°52'W, Johnstown Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 71.6 ha = 176.9 acres. **Description of Plot:** See AB 27: 1006-1007 (1973). **Weather:** Mostly clear, but an unseasonably late snowstorm in May delayed counts 1 week. **Coverage:** May 14, 23,

30, June 6, 13, 20, 27, sunrise to 0945 Total man-hours 21 **Census:** W. Meadowlark, 22 (31, 12); Starling, 20 (28, 11); House Wren, 19 (27, 11); Mourning Dove, 14 (20, 8); Com. Flicker, 10 (14, 6); Red-winged Blackbird, 10; Com. Yellowthroat, 7 (10, 4); Am. Kestrel, 3 (4, 2); Killdeer, 3; Rock Dove, 3; E. Kingbird, 3; N. Oriole, 6; Brown-headed Cowbird, 3; Lazuli Bunting, 3; Com. Snipe, 2; Great Horned Owl, 2; Red-headed Woodpecker, 2; Brown Thrasher, 2; Am. Robin, 2; Blue Grosbeak, 2; Song Sparrow, 2; Am. Bittern, 1; Mallard, 1; Blue-winged Teal, 1; Cinnamon Teal, 1; Sora, 1; Spotted Sandpiper, 1; Ring-necked Pheasant, 1; Yellow-billed Cuckoo, 1; Screech Owl, 1; Rough-winged Swallow, 1; Blue Jay, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Yellow Warbler, 1; Com. Grackle, 1; Am. Goldfinch, 1. **Total:** 37 species; 153 territorial males or females (214/km², 86/100 acres). **Remarks:** Major decrease (>50%) occurred in House Wrens and Red-winged Blackbirds, but all other species were about the same as last year, except no Virginia Rails nor Yellow-headed Blackbirds noted. Species seen in 1978 but not in 1977 included Yellow-billed Cuckoo, Screech Owl, Blue Jay and Am. Goldfinch. The area has been censused regularly since 1972 as a continuing avian monitoring program to evaluate the effects of the Fort St. Vrain Nuclear Generating Station, which is not yet fully operational. — *RONALD A. RYDER, Dept. of Fishery & Wildlife Biology, Colorado State Univ., Ft. Collins, Colo. 80523.*

115. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — **Location:** Oregon; Grant Co., Bates, ¼ mi E of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973; 6 consecutive years. **Size:** 32.38 ha = 80 acres. **Description of Plot:** See AB 27: 1002-1003 (1973). **Weather:** Temperatures 38-65°F; clear on 7 censuses and cloudy on 4. Rain amounted to 1.49 in., June 20-July 31. Fall, winter and spring precipitation was near normal. **Coverage:** June 20-21, 25-27, 29; July 5, 7-8, 13, 15; 0510-0838 and 1713-1928 hours, PDST. Total man-hours: 27. **Census:** Chipping Sparrow, 12 (37, 15); Cassin's Finch, 7 (22, 9); White-crowned Sparrow, 7; Ruby-crowned Kinglet, 4 (12, 5); Yellow-rumped Warbler, 3 (9, 4); Fox Sparrow, 3; Mountain Chickadee, 2; Am. Robin, 2; Mountain Bluebird, 2; Lincoln's Sparrow, 2; Spotted Sandpiper, 1. **Total:** 11 species; 45 territorial males (139/km², 56/100 acres). **Visitors:** Hairy Woodpecker, Steller's Jay, Clark's Nutcracker, Red-breasted Nuthatch, Pine Siskin, Red Crossbill, Dark-eyed Junco. **Remarks:** Nests located: Mountain Chickadee, 1; Mountain Bluebird, 1; Cassin's Finch, 1; White-crowned Sparrow, 1; 3 fledgling day-old Spotted Sandpipers were also observed. Census showed a continuing decline from preceding years in both number of species and territorial males. I am grateful to the staff of the Malheur Nat'l Forest for its cooperation and financial assistance. — *ROBERT A. HUDSON, P.O. Box 81, Bates, Ore. 97817.*

116. FARM WITH PONDS. — **Location:** Utah, Washington Co., Springdale Town (Springdale Development Corp. properties); 37°10'N, 113°00'W; Zion National Park Topo-

graphic Map (Zion Canyon Section), USGS **Size:** 10.52 ha = 26 acres. **Continuity:** Established 1976, 3 consecutive years. **Description of Plot:** See AB 31:79 (1977). **Weather:** Following a winter with record high rainfall, the weather turned dry, with no rain after Apr. 30 **Coverage:** Apr. 23, 30; May 7, 14, 21, 28; June 3, 12, 17, 26; July 3, 10; 0550-1250, MDT Total man-hours: 26. **Census:** Red-winged Blackbird, 14 (133, 54); Yellow Warbler, 5 (48, 19); Mourning Dove, 4 (38, 15); Rough-winged Swallow, 4; Am. Robin, 4; Gambel's Quail, 3 (29, 12); Starling, 3; Black-headed Grosbeak, 3; House Finch, 3; Song Sparrow, 3; Virginia Rail, 2; Spotted Sandpiper, 2; Ash-throated Flycatcher, 2; Warbling Vireo, 2; N. Oriole, 2, Ring-necked Pheasant, 1; Sora, 1; Black-chinned Hummingbird, 1; Belted Kingfisher, 1; Com. Flicker, 1; Downy Woodpecker, 1; W. Kingbird, 1; Black Phoebe, 1; W. Wood Pewee, 1; Violet-green Swallow, 1; Com. Bushtit, 1; Blue-gray Gnatcatcher, 1; Phainopepla, 1; Lucy's Warbler, 1; Brown-headed Cowbird, 1; Blue Grosbeak, 1; Lazuli Bunting, 1. **Total:** 32 species; 73 males and female hummingbird and blackbirds (694/km², 281/100 acres). **Remarks:** Violet-green Swallows nested in a cavity excavated in a Black Willow by Black-capped Chickadees in 1976. Flocks of 15-20 Brown-headed Cowbirds fed all summer around cattle grazing on the plot; there is no way to estimate the number of nests parasitized, but 1 Yellow Warbler nest with 2 young cowbirds was found. House Finches, absent in 1977, did not return until June, although they were abundant early nesters in nearby areas. — *JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767*

117. MIXED - MESOPHYTIC CANYON BOTTOM. — **Location:** New Mexico, McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; Sec. 34, T13N, R13W; 35°19'N, 108°12'W, Pine Canyon Quadrangle, USGS. **Continuity:** Established 1959; 3 intermittent years. **Size:** 12.14 ha = 30 acres. **Description of Plot:** See AB 32:93 (1978). **Weather:** Snow and rain in May brought luxuriant foliage on shrubs and herbs and a plague of minute, biting flies. June was extremely hot (mean high and low 4° and 7°F higher, respectively, than 1977's) and windy. July was also very hot. The first rain of the summer fell on June 29, but the total for the summer was 1.6 in. less than 1977's. Monthly precipitation (inches) and mean daily maximum and minimum temperatures (°F) were as follows: June, 0.13, 81.1, 44.1; July, 1.21, 84.8, 49.6; Aug., 2.18, 79.9, 48.2 (August temperatures through the 18th only). **Coverage:** Apr. 22-26; May 21-24, 31, June 1-3, 5-9, 12-15, 17-27, 30; July 1, 3-6, 11-13, 19-22, 27; 0400-2400, MST. Total man-hours: 74. **Census:** Cliff Swallow, 19 (156, 63), Dusky Flycatcher, 7 (58, 23); Violet-green Swallow, 7; Am. Robin, 7; Pygmy Nuthatch, 6 (49, 20); Broad-tailed Hummingbird, 5 (41, 17); W. Wood Pewee, 5; Grace's Warbler, 5, Chipping Sparrow, 5; Lesser Goldfinch, 4 (33, 13); Solitary Vireo, 3.5 (29, 12); W. Bluebird, 3 (25, 10); Virginia's Warbler, 3; W. Tanager, 3, Rufous-sided Towhee, 3; Mountain Chickadee, 2.5; White-breasted Nuthatch, 2, Brown-headed Cowbird, 2; Black-headed Grosbeak, 2; Com. Flicker, 1.5; Flammulated Owl, 1; Long-eared Owl, 1; Saw-whet Owl, 1, Yellow-billed Sapsucker, 1; W. Flycatcher, 1, Steller's Jay, 1; Mountain Bluebird, 1; Brew-

er's Blackbird, 1, Gray-headed Junco, 1, Screech Owl, +, Williamson's Sapsucker, +, Hairy Woodpecker, +; Ash-throated Flycatcher, +. **Total:** 33 species; 104.5 territorial males or females (861/km², 348/100 acres). **Visitors:** Mallard, Turkey Vulture, Goshawk, Cooper's Hawk, Red-tailed Hawk, Mourning Dove, Great Horned Owl, Com. Nighthawk, Cassin's Kingbird, Say's Phoebe, Scrub Jay, Pinyon Jay, Plain Titmouse, Warbling Vireo, W. Meadowlark, N. Oriole, House Finch, Red Crossbill. **Remarks:** Nests found, 40: Cliff Swallow, 19; Violet-green Swallow, 7; Pygmy Nuthatch and Am. Robin, 2 each; Broad-tailed Hummingbird, Yellow-bellied Sapsucker, Dusky Flycatcher, W. Wood Pewee, Mountain Chickadee, W. Bluebird, Mountain Bluebird, Solitary Vireo, Lesser Goldfinch, and Chipping Sparrow, 1 each. Mourning Doves were rare in the area this summer. A Rufous-sided Towhee occupied a territory used in 1977 by a Green-tailed Towhee. Another Rufous-sided expelled a Green-tailed from his territory early in the season. I thank J. Harmon, S. Pierce, and I. MacLean for help with netting. — *D. ARCHIBALD McCAL-LUM, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323.*

118. ANNUAL GRASSLAND AND VERNAL POOLS. — **Location:** California; Solano Co., 1.2 mi S of Dozier; 38°16'N, 121°49'W, Dozier Quadrangle, USGS. **Continuity:** New. **Size:** 16 ha = 39.5 acres (square; paced with compass). **Description of Plot:** Part of an extensive area of relatively infertile soil underlain by hardpan. Surface topography consists of small hillocks and depressions. The hillocks, called "mima mounds," rise about 1 m above the depressions and are clothed primarily in Eurasian grasses and forbs. The depressions, in contrast, are dominated by native herbaceous plants adapted to a vernal moist environment that desiccates by summer. The larger depressions fill with water during the rainy season (October-April), and are known as vernal pools. One such pool, covering about 0.1 ha, occupies the SW corner. This pool was dry by the end of May. A power transmission line crosses the N half of the plot. **Edge:** The NW corner borders a large vernal pool, which, when full, covers about 25 ha. This pool was half dry by the end of May. A dirt road and barbed wire fence demarcate the W boundary; similar habitat prevails W of this road. The remainder of the plot edges on similar grassland. **Elevation:** 15 ft. **Weather:** Above-average precipitation during the preceding rainy season promoted plant growth and filled the vernal pools. **Coverage:** Apr. 21; May 3-4, 10, 18, 26; 0600-0900, PDT. Total man-hours: 10. **Census:** W. Meadowlark, 3 (19, 8); Horned Lark, 1.5; Killdeer, 1; Mallard, +; Marsh Hawk, +; Am. Avocet, +. **Total:** 6 species; 5.5 territorial males (34/km², 14/100 acres). **Visitors** (Figures give average number per visit): Tricolored Blackbird, 48; Red-winged Blackbird, 9; House Finch, 8; Mourning Dove, 2; Red-tailed Hawk, 1; W. Kingbird, 1. **Remarks:** Nests found or fledglings observed: Mallard, Am. Avocet, Horned Lark, W. Meadowlark. Mallard and avocet nested along the large vernal pool N of the plot, Marsh Hawk to the S of the plot. Thanks to Pacific Gas and Electric Company for funding the research. — *DAVID GAINES, P.O. Box 2764, Oakland, Calif. 94602.*

119. DESERT RIPARIAN - FRESH-WATER MARSH AND PONDS. — **Location:** California; San Bernardino Co., 0.5 mi E of Rte. 62, Big Morongo Wildlife Preserve, Morongo Valley; 34°03'N, 116°35'W, Morongo Valley Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 15.38 ha = 38 acres. **Description of Plot:** See AB 32:113 (1977). **Weather:** Mostly clear, warm to hot days; 39-104°F during census period (usually between 50-75° during censuses). **Coverage:** May 4, 10, 18, 20, 25; June 1, 7, 14; 0530-0830. Total man-hours: 24. **Census:** Bewick's Wren, 11 (72, 29); Starling, 7 (46, 18); House Finch, 6 (39, 16); Song Sparrow, 5 (33, 13); Gambel's Quail, 4 (26, 11); Verdin, 4; Bush-tit, 4; N. Oriole, 4; Brown Towhee, 4; Ash-throated Flycatcher, 3 (20, 8); Brown-headed Cowbird (females), 3; Lesser Goldfinch, 3; Rufous-sided Towhee, 3; Virginia Rail, 2; Mourning Dove, 2; Black-chinned Hummingbird, 2; Ladder-backed X Nuttall's Woodpecker, 2; California Thrasher, 2; Yellow-breasted Chat, 2; Summer Tanager, 2; House Wren, 1.5; Am. Kestrel, 1; Am. Coot, 1; Barn Owl, 1; Screech Owl, 1; Great Horned Owl, 1; Anna's Hummingbird, 1; Phainopepla, 1; Lucy's Warbler, 1; Com. Yellowthroat, 1; Hooded Oriole, 1; Blue Grosbeak, 1; Cooper's Hawk, +; Red-tailed Hawk, +; Roadrunner, +; Wied's Crested Flycatcher, +; Black Phoebe, +; Vermilion Flycatcher, +; House Sparrow, +; Indigo Bunting (♂) X Lazuli Bunting (♀), +. **Total:** 40 species; 87.5 territorial males or females, 569/km² 230/100 acres. **Visitors:** White-winged Dove, White-throated Swift, Costa's Hummingbird, W. Kingbird, Cassin's Kingbird, Scrub Jay, Mockingbird, Bell's Vireo, Black-headed Grosbeak, Lazuli Bunting, Lawrence's Goldfinch, Black-throated Sparrow. **Remarks:** 14 nests were found: Great Horned Owl 1, Barn Owl 1, Anna's Hummingbird 1, Black-chinned Hummingbird 1; Ladder-backed X Nuttall's Woodpecker 1, Wied's Crested Flycatcher 1, Bushtit 1, House Wren 1, Starling 5, Lesser Goldfinch 1. Twenty-nine natural cavities and 13 nest-boxes are on the plot. Censuses were timed too late to take place toward the end of the long nesting season, to emphasize late-nesting species such as Wied's Crested Flycatcher and Summer Tanager. Consequently, census results of early nesters such as hummingbirds, Phainopeplas and California Thrashers are probably less accurate. — *SHARON GOLDWASSER, EUGENE A. CARDIFF and JESSIE KNIFFEN, San Bernardino Co. Museum, 2024 Orange Tree Lane, Redlands, Calif. 92373.*

120. RIPARIAN HARDWOOD FOREST, MARSH, PONDS AND BYPASS CHANNEL. — **Location:** California; Sutter Co., Sutter Nat'l Wildlife Refuge, along W side of Sutter Bypass S of Hughes Rd., 6.8 mi S of Sutter; 39°04'N, 121°45'W, Tisdale Weir and Gilsizer Slough Quadrangle, USGS. **Continuity:** New. **Size:** 10.5 ha = 25.9 acres (nearly rectangular, paced with compass). **Description of Plot:** Part of the Sutter Bypass, a broad, leveed channel used to shuttle and store floodwaters from the Sacramento River during the winter rainy season. More or less contiguous strips of forest, thicket, marsh and pond habitats, about 200 m in width, line the E and W

margins of the bypass for a distance of about 30 km. Broad-leaved, deciduous hardwoods, such as cottonwoods and willows, grow on slightly higher ground. Forest vegetation is best developed on the N third, where Fremont Cottonwoods (*Populus fremontii*), 10-20 m tall, form an open canopy. Willows (*Salix* spp.), cottonwood saplings and, to a lesser extent, Box-elder (*Acer negundo*) comprise a dense woody understory; Mugwort (*Artemisia douglasiana*) and other forbs a sparse herbaceous understory. The forest is broken by several small (less than 0.5 ha) openings grown to tules (*Scirpus acutus*) and/or cat-tails (*Typha latifolia*). On this part of the plot, woody vegetation occupies about 90% and marsh vegetation about 10% of the surface area. On the S 2/3, marsh vegetation is more extensive. Beds of tules and/or cat-tails cover about 60% of the surface area. The remainder is more or less equally divided between open, shallow ponds and dense thickets of willow two to 10 m tall. Buttonwillow (*Cephalanthus occidentalis*) and a few cottonwoods are scattered among the willows. The ponds shrink substantially as the dry season advances, and their muddy shores are invaded by rank growths of Dock (*Rumex crispus*) and other herbaceous plants. A shallow channel about 10 m wide traverses the length of the plot near its W perimeter. It is margined by discontinuous beds of tules and/or cat-tails and dense growths of willow, cottonwood, buttonwillow and other woody plants. **Edge:** The N and S are bordered by similar habitat. To the W, beyond the channel, is the W levee of Sutter Bypass, vegetated with annual grasses and forbs and a few scattered woody saplings. Beyond are field crops interspersed with roads, weedy roadsides and irrigation ditches. Some of the latter support tules, cat-tails and scattered shrubby willows. To the E a small levee separates the plot from a broad swath of open ground about 800 m in width. Beyond this open area is another strip of forest-marsh habitat similar to the plot. During the rainy season vernal pools dot the open area, drying to mudflats in spring and providing habitat for northbound shorebirds and waterfowl. By late spring this area is covered with a rank growth of herbaceous vegetation. **Elevation:** 30-35 ft. **Weather:** Above average precipitation during the preceding rainy season flooded the plot thru early April and promoted lush plant growth during the spring. **Coverage:** Apr. 19, 28; May 5, 7, 9, 24-25. Total man-hours: 33. **Census:** Long-billed Marsh Wren, 14 (134, 54); N. Oriole, 10 (95, 39); Brown-headed Cowbird, 8 (76, 31); Black-headed Grosbeak, 7 (67, 27); Mallard, 6 (57, 23); Am. Coot, 6; Bewick's Wren, 6; House Wren, 5.5 (52, 21); Pied-billed Grebe, 4 (38, 15); Ash-throated Flycatcher, 4; Tree Swallow, 4; Brewer's Blackbird, 4; Am. Goldfinch, 4; Mourning Dove, 3.5 (33, 14); Blue Grosbeak, 3.5; House Finch, 3 (29, 12); Nuttall's Woodpecker, 2.5; Com. Yellowthroat, 2.5; Am. Bittern, 2; Plain Titmouse, 2; Bushtit, 2; Am. Robin, 2; Yellow Warbler, 2; Lazuli Bunting, 2; W. Kingbird, 1.5; Com. Flicker, 1; Downy Woodpecker, 1; Scrub Jay, 1; Yellow-billed Magpie, 1; Song Sparrow, 1, Com. Gallinule, +; Great Horned Owl, +, Black Phoebe, +; W. Wood Pewee, +; Yellow-breasted Chat, +; Brown Towhee, +. **Total:** 36 species; 116 territorial males or females (1107/km², 448/100 acres). **Visitors:** Great

Blue Heron, Great Egret, Black-crowned Night Heron, Red-tailed Hawk, Killdeer, Barn Owl, Cliff Swallow, Barn Swallow, Com. Crow, Starling, W. Meadowlark, Red-winged Blackbird. **Remarks:** Nests found or fledglings observed: Mallard, W. Kingbird, Ash-throated Flycatcher, Tree Swallow, Yellow-billed Magpie, Plain Titmouse, Bushtit, Long-billed Marsh Wren, N. Oriole, Black-headed Grosbeak. Grebe, bittern, mallard, coot, cowbird and goldfinch densities were difficult to determine; the figures are educated guesses. Thanks to Pacific Gas and Electric Company for funding the research. — DAVID GAINES, P.O. Box 2764, Oakland, Calif. 94602.

121. SUBURBAN NATURE CENTER. — **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 the San Gabriel River. **Continuity:** Established 1976; 3 consecutive years. **Size:** 34.4 ha = 85 acres. **Description of Plot:** See AB 31:78 (1976) censuses no. 131 and 132, see also AB 25:656 (1971) census no. 39. **Weather:** Morning low clouds with afternoon sunshine on most days; mean daily temperature 60.9° in April, 65.5° F in May, with 1.77 inches of rain in April, none in May. **Coverage:** Apr. 16, 20, 23, 26; May 5, 9, 16, 22, 29, 31; 0540-0900 hours. Total man-hours: 34. **Census:** Mockingbird, 24 (70, 28); Song Sparrow, 14 (41, 16); Starling, 11 (32, 13); Mourning Dove, 10 (29, 12); Loggerhead Shrike, 7 (20, 8); N. Oriole, 6 (17, 7); Anna's Hummingbird, 5 (15, 6); Bushtit, 4 (12, 5); Am. Robin, 4; Red-winged Blackbird, 4; Lesser Goldfinch, 4; Black-chinned Hummingbird, 3 (9, 4); Brown-headed Cowbird, 3; Spotted Dove, 2; Com. Yellowthroat, 2; Mallard, 1; Am. Coot, 1; Barn Swallow, 1; Scrub Jay, 1; House Finch, 1. **Total:** 20 species; 108 territorial males or females (314/km², 127/100 acres). **Remarks:** 30 nests found: Starling, 11; Mourning Dove, 6; Anna's Hummingbird, 3; Black-chinned Hummingbird, 2; Bushtit, 2; Mockingbird, 2; Loggerhead Shrike, 2; N. Oriole, 2. Thirty-four additional species were seen, of which 15 were spring migrants, 13 were winter residents that had lingered on into April, and the rest transients. — BARBARA W. MASSEY and ANDREW SNYDER, 1825 Knoxville Ave., Long Beach, Calif. 90815.

122. SUBURBAN PARK. — **Location:** California; Los Angeles Co.; El Dorado Park, Area II, Long Beach, 33°49'N, 118°05'W, Los Alamitos Quadrangle, USGS. **Continuity:** New. **Size:** 63.5 ha = 157 acres (from map). **Description of Plot:** Mostly open park and picnic area. See AB 32:48 (1978). **Topography:** Flat, elevation 25 ft. **Edge:** Bounded on the N by another open park, on the E by a freeway and residential area, on the S by El Dorado Nature Center, and on the W by a flood control channel and residential area. **Water:** Two small lakes (5 and 2 acre), connected by a small stream, are in the middle of the plot. **Weather:** 48-93°F. Normal weather after an extremely rainy winter and early spring. **Coverage:** Apr. 28; May 3, 15-16, 18. Total man-hours: 22. **Census:** Loggerhead Shrike, 5 (8, 3); Mockingbird, 4 (6, 3); Brewer's Blackbird, 3 (5, 2); Anna's Hummingbird, 2; W. Meadowlark, 1; Red-winged Blackbird, 1. **Total:** 6 species; 16 territorial males (25/km²,

10/100 acres) **Visitors:** Spotted Dove, Starling, House Sparrow, N. Oriole, House Finch **Remarks:** Feral ducks were breeding near lakes. 5 nests found: Brewer's Blackbird 3, Mockingbird 1. — JOSEPH M. SEEBACHER, 112 Clearmont Road, Elk Grove Village, Ill. 60007.

123. SUBURBAN PARK WITH POND. — **Location:** California; Los Angeles Co.; City of Manhattan Beach; Polliwog Park; 33°52'40"N, 118°22'32"W, Venice Quadrangle, USGS. **Continuity:** New. **Size:** 7.37 ha = 18.2 acres (roughly T-shaped, surveyed, running N-S). **Description of Plot:** Recently relandscaped suburban park. Most plantings are 2-5 years old. Some mature trees remaining. A natural pond, bordered by Papyrus (*Cyperus papyrus*), Horsetail (*Equisetum hyemale*) and Pampas Grass (*Cortaderia selloana*) covers approximately 1.5 acres (.6 ha). A small amphitheater, baseball diamond, and dirt trails cover approximately 9% of the total acreage (1.7 acres = .68 ha). Species comprising 100% of the total number of trees are: *Magnolia grandiflora* 15%; *Eucalyptus citriodora* and *polyanthemos* 13%; Coral Tree (*Erythrina caffra*) 8%; Victorian Box (*Pittosporum undulatum*) 7%; Sycamore (*Plantanus racemosa*) 7%; Evergreen Pear (*Pyrus kawakami*) 7%; Pines (*Pinus halepensis*, *pinna*, *thunbergia*) 7%; *Tristania conferta* 6%; Carrotwood (*Cupaniopsis anacardioides*) 5%; *Podocarpus gracilior* 5%; *Jacaranda acutifolia* 3%; London Plane Tree (*Plantanus acerifolia*) 3%; *Myoporum laetum* 3%; *Ginkgo biloba* 2%; Sweet Gum (*Liquidambar styraciflua*) 2%; Date Palm (*Phoenix reclinata*) 2%; Fig (*Ficus rubiginosa*) 2%; New Zealand Christmas Tree (*Metrosideros tomentosa*) 1%; Brazil Pepper Tree (*Schinus terebinthifolia*) 1%. Virtually no closed canopy; trees range in height from 5 to 45 ft, with an average height of 12 ft. Trees by diameter size class: A (3-6 in.) 94.8%; B (6-9 in.) 3%; D (15-21 in.) 2%; E (21-27 in.) 0.2%. Dominant shrubs are Acacia (*Acacia cultriformes*) 19%; *Xylasna congestum* 18%; Com. Juniper (*Photina fraseri*) 12%; Mint Julep Juniper (*Juniperus chinensis*) 10%; *Prunus ilicifolia* 8%; Holly (*Ilex vomitoria*) 6%; and Mock Orange (*Pittosporum tobira*) 4%. The remaining 23% is composed of a wide variety of very young ornamental shrubs. Ground cover is composed of Cape Weed (*Arctotheca calendula*), Trailing African Daisy (*Osteospermum fruticosum*), Ice Plant (*Drosanthemum hispidum*), and a grass (*Alta fescue*); 65% in all. **Edge:** Bounded on the E and W by schools with large fields and numerous trees and shrubs. The N and S edges are terminated by roadways, followed by suburban housing with many large trees. **Topography:** Gently sloping; flat at the pond site. [!-Ed.]. **Elevation:** 75-100 ft. **Weather:** Seasonably warm and dry. Cool and misty (54°F low) in the early morning hours. **Coverage:** Apr. 16-17, 19, 23, 30; May 5, 7, 10, 19; 0530-0900. Total man-hours: 21. **Census:** Mallard, 6 (81, 33); House Finch, 5 (68, 27); Mockingbird, 4 (54, 22); House Sparrow, 3 (41, 16); Domestic Goose, 2; Am. Coot, 2; Mourning Dove, 2; Anna's Hummingbird, 2; Scrub Jay, 2; Starling, 2; Long-billed Marsh Wren, 1; Red-winged Blackbird, 1. **Total:** 12 species; 32 territorial males (434/km², 176/100 acres). **Remarks:** Nests located: Domestic Goose, 1; Mallard, 3; Am. Coot, 1; Starling, 1; House Sparrow, 1; House Finch, 2. One pair

of Sora Rails and one pair of Virginia Rails were present throughout the period, possibly breeding, but nests were not located. Several Killdeer, a pair of Com. Crows, and two pairs of Brewer's Blackbirds were often present on the plot. The geese, Mallards, coots, Sora and Virginia rails, Marsh Wrens and Red-winged Blackbirds, were clearly associated with the pond/marsh habitat. The remaining species were observed in the more park-like areas, with one Starling nesting in the baseball dugout. — ANNE F. MABEN, 1708 Oak Ave., Manhattan Beach, Calif. 90266.

124. URBAN PARK. — **Location:** California; Los Angeles Co., Alondra Park, bounded on the N by Manhattan Beach Blvd. and on the S by Redondo Beach Blvd. **Continuity:** New. **Size:** 13.9 ha = 34.4 acres (from architectural map; odd shaped about 833 yd N-S and 108 yd to 450 yd E-W). **Description of Plot:** Much of the area is mowed grass. There is a lake about 190 × 290 yd and a swimming pool in the S end of the park. In the N end is a 40 × 100 yd asphalt parking lot and a brick dust baseball diamond. About 3% of the area is covered by cement paths. The dominant trees are Queen Palms (*Arecastrum romanzoffianum*, 32.7% of the total) many of which grow around the lake; Scotch Pine (*Pinus sylvestris*), 12.5%, recently planted along the margins of the path running N-S through the park, Am. Elm (*Ulmus americana*), 6%; Sycamore (*Platanus racemosa*), 6%; Yew (*Taxus* sp.), 5.2%; *Magnolia grandiflora*, 5.2%; Mountain Ash (*Sorbus* sp.), 5.2%; *Eucalyptus* sp., 4.7%; Pine 3.6%; Olive (*Olea* sp.), 3.6%; and Alder 3.1%. **Edge:** Bounded by a golf course on the W, a college on the E and residential areas on the N and S. **Topography:** Primarily flat. **Elevation:** 70 ft. **Weather:** Mean high and low temperatures were 83° and 62°F. There was no precipitation although this follows a winter of exceptionally high rainfall. **Coverage:** May 12, 14, 16-17, 19, 21; between 0630 and 0930. Total man-hours: 14:35. **Census:** Starling, 16 (115, 47); House Sparrow, 8 (57, 23); Rock Dove, 6 (43, 17); Mockingbird, 5; House Finch, 5 (36, 15); Mallard, 4 (29, 12); Mourning Dove, 1; Scrub Jay, 1; Yellow Warbler, 1. **Total:** 9 species; 47 territorial males or females (338/km², 137/100 acres). **Visitors:** Com. Crow, Brewer's Blackbird. **Remarks:** Four nests were located: Mourning Dove, Mockingbird, 3. Birds residing on the plot but, for which breeding behavior was not observed: Double-crested Cormorant, 1; Am. Kestrel, 1; Am. Coot, 2; and Mourning Dove, 6. Special thanks to Malcolm Crouch for assistance in locating nests. — HARRIETT CROUCH, 4107 W. 165th St., Lawndale, Calif. 90260.

Breeding Birds of Prairie Grassland and Shrubland Habitats in Northeastern Montana — 1978.

The 5 plots described below (Nos. 125-29) are located on the Dreyer Brothers Ranch near the center of McCone County, Montana, approximately 33.8 km WNW of the town of Circle. Censuses were conducted as part of a baseline wildlife study and monitoring program in connection with a proposed lignite mine and conversion facility. The plots sample the predominant grassland and shrubland

habitats of the dissected uplands characteristic of the area.

The weather pattern during 1978 had a marked effect on vegetation, which in turn affected breeding bird populations. The winter of 1977-1978 was "severe" in comparison to the "moderate" winter of 1976-1977. The National Weather Service at Glasgow (50 mi. NW of the area) recorded only eight days with at least 13 cm (5 in.) of snow on the ground during December and January of 1976-1977, compared to 50 such days during December and January of 1977-1978. The average temperature in January 1977 was -16°C (3°F) (3° below the norm), while the average in January 1978 was -19°C (-2°F) (6° below the norm). Precipitation at Circle during the spring and summer months (April through July) was 33.43 cm (13.16 in.), or 10.16 cm (4.00 in.) above normal. Thus, last year's census represented an abnormally dry year following a mild winter; this year's report represents a normal-to-wet year following a severe winter. Plant phenology was at least one week behind that of 1977; this was especially noticeable in the case of Silver Buffaloberry (*Shepherdia argentea*), which was only beginning to leaf out in mid-May. As a consequence, nesting of shrub-loving species (E. Kingbird, Brown Thrasher, Loggerhead Shrike, Rufous-sided Towhee) was also later than that noted for 1977. Grasshopper populations were markedly down from summer 1977 levels, probably as a result of winter kill; they were rare until mid-July, by which time they were common but not nearly as abundant as in 1977. This combination of increased soil moisture and reduced grasshopper grazing pressure resulted in luxuriant grassland development which was truly remarkable in comparison to 1977. Where most Blue Grama (*Bouteloua gracilis*)-needle-and-thread (*Stipa comata*) grasslands averaged only 2-15 cm high in 1977, the same areas in 1978 supported vigorous grasses nearly 1 m in height. Needle-and-thread development was most spectacular, and the Needle-and-thread-Blue Grama grassland plot resembled a wheatfield from a distance. Stockponds in the area were full or nearly full throughout the season, and supported much higher densities of waterfowl than 1977.

This study was funded by Dreyer Brothers, Inc. — LARRY S. THOMPSON and DANIEL SULLIVAN, Mont. Dept. of Natural Resources and Conservation, 32 South Ewing, Helena, Mont. 59601.

125. SILVER BUFFALOBERRY - RED OSIER DOGWOOD COULEE. — **Location:** Montana; McCone Co.; overlaps boundary of Sec. 3 and 10, T20N, R45E; $47^{\circ}31'N$, $105^{\circ}58'W$; AMS, Glendive (NL 13-2). **Continuity:** Established 1977. **Size:** 25 ha = 61.8 acres. **Description of Plot:** See AB 32:108 (1978). **Coverage:** May 21, 25, 28-29; June 16-18, 20; July 19; 9 trips, 0450-2100. Total man-hours: 21.3. **Census:** Yellow Warbler, 6 (24, 10); W. Meadowlark, 6; Rufous-sided Towhee, 6; Brown Thrasher, 5.5 (22, 9); Lark Sparrow, 4.5 (18, 7); Mourning Dove, 4 (16, 6); E. Kingbird, 3.5 (14, 6); Rock Wren, 2.5; Brown-headed Cowbird, 2; Horned Lark, 1; Loggerhead Shrike, 1; Marsh Hawk, +; Ring-necked Pheasant, +; Say's Phoebe, +; Brewer's Blackbird, +. **Total:** 15 species; 42 territorial males or females ($168/\text{km}^2$, $68/100$

acres) **Visitors:** Mallard, Sharp-tailed Grouse, Great Horned Owl, Com. Nighthawk, Least Flycatcher, Black-billed Magpie, Mountain Bluebird, Black-headed Grosbeak, Chipping Sparrow. **Remarks:** Two nests were located: Mourning Dove and E. Kingbird.



Census 125. Silver Buffaloberry-Red Osier Dogwood Coulee.

126. SILVER BUFFALOBERRY-SILVER SAGEBRUSH COULEE. — **Location:** Montana; McCone Co.; overlaps border of Sec. 19 and 20, T20N, R45E; $47^{\circ}28'N$, $106^{\circ}1'W$; AMS, Jordan (NL 13-1). **Continuity:** Established 1977. **Size:** 25 ha = 61.8 acres. **Description of Plot:** See AB 32:108-9 (1978). **Coverage:** May 26-27, 29; June 16, 18-20, 23; July 20; 9 trips, 0455-2030. Total man-hours: 14.8. **Census:** W. Meadowlark, 7.5 (30, 12); Lark Bunting, 7 (28, 11); Mourning Dove, 6 (24, 10); Horned Lark, 4 (16, 6); Com. Nighthawk, 3 (12, 5); Brown Thrasher, 3; Loggerhead Shrike, 3; E. Kingbird, 2; Brown-headed Cowbird, 2; Ring-necked Pheasant, 1; Red-tailed Hawk, +. **Total:** 11 species; 38.5 territorial males or females ($154/\text{km}^2$, $62/100$ acres). **Visitors:** Sharp-tailed Grouse, Cliff Swallow, Yellow Warbler, Brewer's Blackbird, Grasshopper Sparrow, Lark Sparrow. **Remarks:** Seven nests were located: Ring-necked Pheasant, 1; Com. Nighthawk, 1; Mourning Dove, 1; Loggerhead Shrike, 3; W. Meadowlark, 1.

127. SILVER SAGEBRUSH FLAT. — **Location:** Montana; McCone Co.; SE quarter of Sec. 31, T20N, R45E; $47^{\circ}25'N$, $106^{\circ}1'W$; AMS, Jordan (NL 13-1). **Continuity:** Established 1977. **Size:** 24 ha = 59.3 acres. **Description of Plot:** See AB 32:107-8 (1978). **Coverage:** May 23-24, 26, 28; June 15, 17, 19-20; July 20; 9 trips, 0450-2030. Total man-hours: 15.6. **Census:** Brewer's Sparrow, 10 (42, 17); Com. Yellowthroat, 6 (25, 10); W. Meadowlark, 6; Lark Bunting, 5 (21, 8); Grasshopper Sparrow, 3.5 (15, 6); Sharp-tailed Grouse, 2; E. Kingbird, 2; Sprague's Pipit, 2; Baird's Sparrow, 1.5; Mourning Dove, 1; Loggerhead



Census 127. Silver Sagebrush Flat.

Shrike 1 Brown-headed Cowbird 1 Chestnut-collared Longspur, 1; Marsh Hawk, +; Horned Lark, +; Bobolink, +; Red-winged Blackbird, +. **Total:** 17 species; 42 territorial males or females ($175/\text{km}^2$, $71/100$ acres). **Visitors:** Mallard, Gadwall, Com. Nighthawk, Cliff Swallow, Brown Thrasher, Brewer's Blackbird. **Remarks:** Three nests were found: Marsh Hawk, E. Kingbird, and Loggerhead Shrike. Bobolink and Baird's Sparrow were not seen in the vicinity in 1977, but were quite common in 1978. The Horned Lark, Sprague's Pipit, Baird's Sparrow, and Chestnut-collared Longspur territories were all located in grassland outside the sagebrush flat, and only partially overlapped the plot. The E. Kingbird and Loggerhead Shrike nested in the isolated clumps of Silver Buffaloberry near the NE end. Common Yellowthroats were restricted to patches of Snowberry along the drainage bottom, and the Marsh Hawk nest was located in a dense Snowberry patch very near the location of last year's nest. Sharp-tailed Grouse were seen repeatedly, and although no broods were observed, breeding is probable since a lek was located within the NE corner.

128. NEEDLE-AND-THREAD - BLUE GRAMA GRASSLAND. — **Location:** Montana; McCone Co.; borders center of E boundary of Sec. 25, T20N, R44E; $47^{\circ}27'N$, $106^{\circ}2'W$; AMS, Jordan (NL 13-1). **Continuity:** Established 1977. **Size:** 25 ha = 61.8 acres. **Description of Plot:** See AB 32:109 (1978). **Coverage:** May 20-21, 25, 27; June 15, 17-18, 21; 8 trips, 0445-2045. Total man-hours: 14.6. **Census:** Horned Lark, 12 (48, 19); Chestnut-collared Longspur, 10 (40, 16); Lark Bunting, 6.5 (26, 11); W. Meadowlark, 5.5 (22, 9); Grasshopper Sparrow, 3 (12, 5); Prairie Falcon, +. **Total:** 6 species; 37 territorial males or females ($148/\text{km}^2$, $60/100$ acres). **Visitors:** Marsh Hawk, Killdeer. **Remarks:** A Horned Lark and a Chestnut-collared Longspur nest were located. Grassland development was so lush the plot was scarcely recognizable from its condition during the summer of 1977. Needle-and-thread (*Stipa comata*) was particularly vigorous, attaining a height of nearly 1 m.

129. WESTERN WHEATGRASS - BLUE GRAMA PASTURE. — **Location:** Montana; McCone Co.; Sec. 23, T20N, R44E; $47^{\circ}28'N$, $106^{\circ}3'W$; AMS, Jordan (NL 13-1). **Continuity:** Established 1977. **Size:** 25 ha = 61.8 acres. **Description of Plot:** See AB 32:109 (1978). **Coverage:** May 21, 27-28; June 15-16, 19, 21; July 19; 8 trips, 0450-2100. Total man-hours: 13. **Census:** Horned Lark, 10 (40, 16); Lark Bunting, 7 (28, 11); Chestnut-collared Longspur, 5.5 (22, 9); W. Meadowlark, 3.5 (14, 6); Killdeer, +. **Total:** 5 species; 26 territorial males or females ($104/\text{km}^2$, $42/100$ acres). **Visitors:** Marsh Hawk, Am. Kestrel, Wilson's Phalarope, Mourning Dove, Cliff Swallow, Loggerhead Shrike, Red-winged Blackbird, Brewer's Blackbird, Brown-headed Cowbird, Grasshopper Sparrow, Chipping Sparrow. **Remarks:** A Horned Lark nest was found. On July 19, a flock estimated at 700 Brewer's Blackbirds and Brown-headed Cowbirds was observed using the plot. The increase in Lark Buntings and Chestnut-collared Longspur densities over last year is remarkable, and is believed to be due primarily to the relatively lush grassland development.

130. BLUE GRAMA - RABBITBRUSH GRASSLAND. — **Location:** New Mexico, McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; SW¼, SW¼, Sec. 26, T13N, R13W; 35°19'N, 108°11'W, Pine Canyon Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 16 19 ha = 40 acres. **Description of Plot:** See AB 32:96 (1978). **Weather:** See Census 112. **Coverage:** Apr. 22; May 21, 25; June 1, 3-4, 6-7, 12, 16, 19, 22-24, 29; 0400-2000, MST. Total man-hours: 32. **Census:** Brewer's Sparrow, 8 (49, 20); Vesper Sparrow, 5 (31, 12); Green-tailed Towhee, 2.5; Horned Lark, 2; W. Meadowlark, 1. **Total:** 5 species; 18.5 territorial males (114/km², 46/100 acres). **Visitors:** Red-tailed Hawk, Com. Flicker, Cassin's Kingbird, Say's Phoebe, Rough-winged Swallow, Barn Swallow, Cliff Swallow, Am. Robin, W. Bluebird, Mountain Bluebird, Starling, Lark Sparrow. **Remarks:** Nests found, 4; Brewer's and Vesper Sparrows, 2 each. Brewer's Sparrows doubled from 4 last year. Cowbird parasitism has not yet afflicted this population, although it is rampant in the woodlands one-half mile away. A singing ♂ Cassin's Sparrow and adult White-crowned Sparrow, both on June 19, were unusual. — *D. ARCHIBALD McCALLUM, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323.*

131. PYGMY FOREST-CHAPARRAL. — **Location:** Utah, Kane Co., Entrance of Zion Nat'l Park; 37°14'N, 112°52'30"W (W½ of NE¼; E½ of NW¼ of NW¼, Sec. 20, T41S, R9W, Salt Lake B&M; Zion Nat'l Park Topo Map (Zion Canyon Section), USGS. **Size:** 16 19 ha = 40 acres. **Continuity:** Established 1977. **Description of Plot:** See AB 32:96-97 (1978). **Weather:** After a winter of record precipitation, the weather turned dry, with no rain during the entire census period. **Coverage:** May 14, 21, 28; June 5-6, 9-10, 19-20, 23-24; July 1, 8, 15; 0555-1215, MDT. Total man-hours: 22. **Census:** Cassin's Finch, 6 (37, 15); Black-throated Gray Warbler, 5 (31, 13); Mourning Dove, 4 (25, 10); Bushtit, 4; W. Bluebird, 4; Broad-tailed Hummingbird, 3 (19, 8); Ash-throated Flycatcher, 3; Steller's Jay, 3; Rufous-sided Towhee, 3; Chipping Sparrow, 3; Hairy Woodpecker, 2; Cassin's Kingbird, 2; Plain Titmouse, 2; White-breasted Nuthatch, 2; Gray Vireo, 2; Green-tailed Towhee, 2; Gray Flycatcher, 1; Scrub Jay, 1; Solitary Vireo, 1; Black-headed Grosbeak, 1. **Total:** 20 species; 54 males and female hummingbirds (334/km², 135/100 acres). **Visitors:** Golden Eagle (4 trips), Am. Kestrel (1), White-throated Swift, Violet-green Swallow. **Remarks:** Ash-throated Flycatcher, Solitary Vireo and Black-headed Grosbeak were new this year. The Ash-throated Flycatchers occupied 3 nesting cavities used last year by W. Bluebirds. Black-throated Gray Warblers increased from 2 to 5. — *JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767.*

132. CREOSOTE BUSH COMMUNITY. — **Location:** California; San Bernardino Co., Milligan, 35 mi SE of Cadiz, at an old A.T. & S.F. Railroad Station; 34°16'N, 115°11'W, where the railroad crosses a small wash that forms the E boundary. In the SW¼ of Sec. 10, T2N, R17E, Milligan Quadrangle, USGS. **Continuity:** New. **Size:** 12.26 ha = 30.3 acres (1100 × 1200 ft, measured). **Description of**

Plot: The last homogeneous stand of creosote bush nearest Old Woman Mountains. The small wash contains slightly more dense cover; otherwise, vegetation is sparse throughout. The site has some use by off-road vehicles. See AB 33:1 (WBPS 65). **Water:** Nearest water is transient, 1 mi S between the salt evaporators and the salt refinery. Nearest permanent water is in the salt evaporators. Nearest permanent fresh water is at Iron Mountain Pumping Station, 9.5 miles SE of the plot. **Weather:** Temperatures 60-120°F, (average 90°). Winds 5-30 knots. **Coverage:** Apr. 6-7, 27-28; May 13, 20-21; June 12; 0500-1030 and 1330-2200. Total hours: 36. **Census:** Black-throated Sparrow, 1; Le Conte's Thrasher, +; Mourning Dove, +. **Total:** 3 species; 1 territorial male (8/km², 3/100 acres). **Visitors:** White-winged Dove, Say's Phoebe, Loggerhead Shrike. **Remarks:** This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *D. JOHNSTON and M. FOSTER, 99 S. 12th St., San Jose, Calif. 95112.*

133. CREOSOTE - JOSHUA TREE DESERT. — **Location:** California; San Bernardino Co.; Fairview Valley; 34°35'N, 117°6'W, at the foot of Fairview Mountain 1 mi N of Red Top Mine, 3 mi NE of Apple Valley; in NW¼ of Sec. 29 and SW¼ of Sec. 20, T6N, R2W of the Apple Valley Quadrangle, USGS. **Continuity:** New. **Size:** 36 ha = 88.96 acres (square, 600 × 600 m, paced). **Description of Plot:** See AB 33:1 WB PS 71 (1978). **Weather:** Skies clear on 5 days, light cloudiness on 3; winds 5-10 mph on 3 days, no wind on 5. Only trace precipitation throughout period. **Coverage:** Apr. 26, 28; May 3, 8, 10, 22, 26; June 1; 0630-1030 and 1955-2145, PDST. Total man-hours: 32.4. **Census:** Black-throated Sparrow, 4 (11, 4); Cactus Wren, 2; Loggerhead Shrike, 2; Costa's Hummingbird, 1; Ash-throated Flycatcher, 1; Rock Wren, 1; Lazuli Bunting, 1; Mourning Dove, +; Say's Phoebe, +; Le Conte's Thrasher, +; Wilson's Warbler, +; Scott's Oriole, +; W. Tanager, +; White-crowned Sparrow, +. **Total:** 14 species; 12 territorial males (33/km², 13/100 acres). **Remarks:** One Cactus Wren nest was found. Many inactive nests were found in Joshua Trees and Pencil Cactus (*Opuntia ramosissima*). Annual growth, this year, was extremely heavy and large numbers of grasshoppers were seen throughout the study. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *ROSS E. LANDRY, 6822 Westminster Ave., #43, Westminster, Calif. 92683.*

134. DESERT OASIS WOODLAND I. — **Location:** California; Riverside Co., Corn Springs Oasis, about 9 mi SW of Chuckwalla Road off ramp on Interstate Hwy 10 near Desert Center; located in the NE 1/4, NE 1/4, Sec. 29, and the NW 1/4, NW 1/4, Sec. 28, T6S, R16E, San Bernardino Base & Meridian; Chuckwalla Mountains Quadrangle, USGS; 33°38'N, 115°19'W. **Continuity:** New. **Size:** 5.73 ha = 14.2 acres (rectangular, 273 x 210 m, surveyed). **Description of Plot:** See AB 33:1 (WBPS 47). **Weather:** Temperatures 52°-79°F (daily mean of 67°), with light breezes and clear to partly cloudy skies. **Coverage:** Apr. 23-24; May 9-11, 23-25; 8 trips, 0615-1030, and 4 trips, 1730-2200. Total man-hours: 38. **Census:** House

Finch, 13 (226, 92), Gambel's Quail, 4 (70, 28), Verdin, 3 (61, 25), Costa's Hummingbird, 2.5; Hooded Oriole, 1; Scott's Oriole, 1. **Total:** 6 species; 25 territorial males (435/km², 176/100 acres). **Visitors:** Red-tailed Hawk, White-winged Dove, Mourning Dove, Screech Owl, Great Horned Owl, Poorwill, Lesser Nighthawk, Ladder-backed Woodpecker, W. Kingbird, Ash-throated Flycatcher, Say's Phoebe, Rock Wren, Mockingbird, Black-tailed Gnatcatcher, Phainopepla, Loggerhead Shrike, Lesser Goldfinch. **Remarks:** 8 nests were located: House Finch, 4; Costa's Hummingbird, 1, Verdin, 1; Hooded Oriole, 1; Scott's Oriole, 1. The oasis habitat covers only 0.5 acres of the total, and is restrictive on the numbers of successful breeding territories established. However, the availability of surface water attracted 43 different species of visitors and transients. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *RICHARD W. KOOPMANN, 45-421 Sunset Lane, #2, Palm Desert, Calif. 92260.*

135. DESERT OASIS WOODLAND II. — **Location:** California; Riverside Co., Pushawalla Palms Oasis, about 1½ mi NE of the Washington St., Ramon Road transition, E of Thousand Palms; located in the SW¼, NW¼ and the NW¼, SW¼, Sec. 17, T4S, R7E, San Bernardino Base & Meridian, Myoma Quadrangle (7½), USGS; 33°49'N 116°17'W. **Continuity:** New. **Size:** 10.0 ha = 24.7 acres (trapezoidal 492 × 198 × 522 m × 198 m, paced). **Description of Plot:** See AB 33:1 (WBPS 48). **Weather:** Temperatures 52°-84°F (daily mean of 69°), with light breezes to 15 mph under mostly clear skies. **Coverage:** Apr. 19, May 6-7, 9, 18, 22, 25; June 1; 8 trips, 0630-1100 and 2 trips, 1730-2200. Total man-hours: 34. **Census:** House Finch, 12 (120, 49), Starling, 5 (50, 20); Gambel's Quail, 3 (30, 12), Rock Wren, 3; Cactus Wren, 1. **Total:** 5 species; 24 territorial males (240/km², 97/100 acres). **Visitors:** Red-tailed Hawk, Prairie Falcon, Am. Kestrel, White-winged Dove, Mourning Dove, Screech Owl, Great Horned Owl, Poorwill, Lesser Nighthawk, White-throated Swift, Costa's Hummingbird, Ladder-backed Woodpecker, W. Kingbird, Say's Phoebe, Rough-winged Swallow, Verdin, Black-tailed Gnatcatcher, Phainopepla, Loggerhead Shrike, Lesser Goldfinch, Black-throated Sparrow. **Remarks:** 9 nests were located: House Finch, 6; Starling, 2; Rock Wren, 1. Although the spring at Pushawalla Palms has surface flow all year round, the limited amount of oasis habitat precludes accommodating large numbers of breeding territories. The availability of surface water attracts a large variety of visitors and transients. I thank Paul Romero for assistance in the bird counts. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *RICHARD W. KOOPMANN, 45-421 Sunset Lane, #2, Palm Desert, Calif. 92260.*

136. DESERT RIPARIAN THICKET. — **Location:** California; Inyo Co., Amargosa River George; 0.8 km S of the Tecopa Post Office; begins in the SE ¼ of Sec. 9 and extends into the NE ¼ of Sec. 16, T20N, R7E, Tecopa Quadrangle, USGS; 35°50'N, 116°13'W. **Continuity:** New. **Size:** 10.3 ha = 25.5

acres (approximate rectangle, 212 × 487 m, paced) **Description of Plot:** See AB 33 1 (WBPS 85). **Weather:** Temperatures 40-104°F; 6.9 cm (2.71 in) of rainfall recorded. **Coverage:** Apr. 12, 14, 16, 18; May 10, 12, 14; June 28; mostly 0530-0930. Total man-hours: 30 **Census:** Verdin, 10 (97, 39); Bewick's Wren, 7 (68, 27); Yellow-breasted Chat, 6 (58, 24); Blue Grosbeak, 5 (48, 20); Brown-headed Cowbird, 4 (39, 16); Mourning Dove, 3 (29, 12); Com. Yellowthroat, 3; Crissal Thrasher, 2 5 (24, 10); Ash-throated Flycatcher, 2 (19, 8); Rough-winged Swallow, 2; Gambel's Quail, 1; Killdeer, 1; Black Phoebe, 1; Red-tailed Hawk, +; Roadrunner, +; Lesser Nighthawk, +, White-throated Swift, +; Belted Kingfisher, +; Com. Raven, +; Phainopepla, +; Loggerhead Shrike, +. **Total:** 21 species; 47.5 territorial males (460/km², 186/100 acres). **Visitors** (total number recorded on 8 censuses): Black-crowned Night Heron, 2; Turkey Vulture, 2; Cooper's Hawk, 1; Prairie Falcon, 1; Killdeer, 7; Spotted Sandpiper, 2; Costa's Hummingbird, 1; *Selasphorus* sp., 1; W Kingbird, 1; Say's Phoebe, 3; W. Flycatcher, 1; *Empidonax* sp., 1; W. Wood Pewee, 7; Olive-sided Flycatcher, 1; Violet-green Swallow, 2; Tree Swallow, 15; Barn Swallow, 22; Rock Wren, 1; Am. Robin, 1; Black-tailed Gnatcatcher, 2; Ruby-crowned Kinglet, 8; Cedar Waxwing, 6; Solitary Vireo, 1; Warbling Vireo, 2; Orange-crowned Warbler, 11; Lucy's Warbler, 3; Yellow Warbler, 11, Yellow-rumped Warbler, 10; Townsend's Warbler, 3; Wilson's Warbler, 13; Hooded Oriole, 2; Brewer's Blackbird, 8; Black-headed Grosbeak, 2; Lazuli Bunting, 8; Lesser Goldfinch, 17; Green-tailed Towhee, 1; Black-throated Sparrow, 1; Dark-eyed Junco, 4, White-crowned Sparrow, 12; Lincoln's Sparrow, 1. **Remarks:** The breeding season in this area extends beyond the dates of the census coverage. Phainopeplas and Crissal Thrashers are resident species that breed early and have fledged young by the time the migrant breeders arrive. The importance of the habitat to migratory species is evident in the list of visitors, 28 of which may be considered transitory. One nest each was found of Black Phoebe, Rough-winged Swallow, Verdin and Com. Yellowthroat. Thanks to Ken Smith for weather data, Jan Tarble for access to field notes, and Meryl Evens for field assistance. This project was sponsored by the Bureau of Land Management, California Desert Plan Program. — JULES EVENS, Box 59, Pt Reyes Station, Calif. 94956.

137. DISTURBED COASTAL SCRUB A.

— **Location:** California; Marin Co., 3.5 mi NW of Bolinas, just inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1972; 6 intermittent years. **Size:** 4.7 ha = 11.6 acres. **Description of Plot:** See AB 26:987-988 (1972). **Weather:** Early spring was cool with 6 in. of rain from late March to late April. May was warm with virtually no rain. Winds were 5-10 mph and NW most mornings. **Coverage:** March 29-30; Apr. 2-4, 6-7, 10, 13, 17, 23, 26; May 2-3, 8, 12, 22, 27, 0545-2000 hours, but mostly in the morning. Total man-hours: 30. **Census:** White-crowned Sparrow, 5 (107, 43); Wrentit, 2.5; Song Sparrow, 2; Allen's Hummingbird, 1; Bewick's Wren, 1; Rufous-sided Towhee, 1; Am. Goldfinch, 1; Calif. Quail, 0.5; Brown

Towhee, 0.5, Scrub Jay, +, Cliff Swallow, +, Barn Swallow, +, Violet-green Swallow, +, Com. Bush-tit, +; Am. Robin, +; Orange-crowned Warbler, +; Brown-headed Cowbird, +; House Finch, +. **Total:** 19 species; 14.5 territorial males (309/km², 125/100 acres). **Remarks:** Nests found: White-crowned Sparrow, 3. Contribution No. 171, PRBO. — DAN TAYLOR, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

138. DISTURBED COASTAL SCRUB B.

— **Location:** California; Marin Co., 3.5 mi NW of Bolinas, and 0.16 mi inside the S boundary of Point Reyes Nat'l Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 7 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 25:1002-1003 (1971). **Weather:** See Census 137. **Coverage:** Mar. 27, 29-30; Apr. 3-4, 7-8, 10, 13, 24, 26, 28; May 2-3, 12, 19, 22, 26, 29; 0530-1930 hours. Total man-hours: 30.5. **Census:** Song Sparrow, 8 (99, 40); White-crowned Sparrow, 7 (86, 35); Am. Goldfinch, 3 (37, 15); Wrentit, 1.5; Rufous-sided Towhee, 1; House Finch, 0.5; Brown-headed Cowbird, 0.5; Red-tailed Hawk, +; Calif. Quail, +; Allen's Hummingbird, +; Com. Flicker, +; Rough-winged Swallow, +; Barn Swallow, +; Cliff Swallow, +; Scrub Jay, +; Bush-tit, +; Am. Robin, +; W. Bluebird, +; Starling, +; Pine Siskin, +; Brown Towhee, +; Golden-crowned Sparrow, +. **Total:** 22 species; 21.5 territorial males (266/km², 108/100 acres). **Remarks:** Nests found: Am. Goldfinch, 1; White-crowned Sparrow, 1; Song Sparrow, 1. Of note is the 7 territorial White-crowned Sparrows compared to 3 last year; this may be in part due to more thorough coverage. Contribution No. 172, PRBO. — GORDON BEEBE, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

139. GRAZED CREOSOTE BUSH - YUCCA DESERT SCRUB I.

— **Location:** California; San Bernardino Co., Lanfair Valley, E. Mohave Desert, 17.75 mi N of Goffs, NW 1/4 Sec. 29 and NE 1/4 Sec. 30, T13N, R18E, Lanfair Valley Quadrangle, USGS; 35°11'N, 115°04'W. The SW corner is about 90 m W and 300 m N of the water tank located in the NE 1/4 of Sec. 30. **Continuity:** New. **Size:** 20 ha = 49.4 acres (rectangular, 400 × 500 m, measured with steel tape, the length running N-S on a magnetic N compass grid). **Description of Plot:** Typical of large areas of the E Mohave Desert. Creosote, Goldenhead, and Big Galleta Grass are the major perennial species. Joshua Trees and Mohave Yuccas are widely scattered but are conspicuous and important as nesting sites. Four 100 pace toe-point transects were conducted to determine perennial plant cover and species composition. The substratum is composed of 51% dead plant litter, 27.25% bare ground, 18.5% small rocks (1/8 in.-3 in.), 3% shrub stems, and 1% large rocks (3 in.). Perennial plant species composition was 37.5% Goldenhead (*Acamptopappus spaerocephalus*), 23.25% Creosote Bush (*Larrea tridentata*), 13.5% Big Galleta Grass (*Hilaria rigida*), 13.25% Anderson Thornbush (*Lycium andersonii*), 3.5% Little-leaved Ratany (*Krameria parvifolia*), 2.75% Winterfat (*Eurotia lanata*), 1.25% Nevada Joint Fir (*Ephedra nevadensis*), 1.25% Cheesebush (*Hymenoclea salsola*), 1% Woolly-fruited Burbush (*Ambrosia eriocentra*), and

lesser amounts of Ricegrass (*Oryzopsis hymenoides*), Joshua Tree (*Yucca brevifolia*), Mohave Yucca (*Yucca schidigera*), Burrobush (*Ambrosia dumosa*), Scale-broom (*Lepidospartum squamatum*), and Silver Cholla (*Opuntia echinocarpa*). The canopy cover of 15% was composed of 50% Creosote Bush, 28.5% Goldenhead, 15% Anderson Thornbush, 3.5% Cheesebush, 1.5% Little-leaved Ratany, and 1.5% Big Galleta Grass. The high percentage of litter was almost entirely due to a heavy cover of dead annuals brought about by large amounts of precipitation during the previous winter. The annual cover was primarily composed of Fiddleneck (*Amsinkia tessellata*) with Filaree (*Erodium cicutarium*), Peppergrass (*Lepidium lasiocarpum*), and several species of Buckwheat (*Eriogonum*) also present in large amounts. The plot has a long history of livestock grazing which has affected percent cover and species composition and is situated near a livestock watering tank where grazing pressure and soil disturbance is particularly intense. **Edge:** Bounded by similar habitat to the E and W. Trampling by livestock near the water tank has created a large open area covered with weedy annuals immediately S of the plot. Another large open area lies a short distance to the N. A seldom-travelled dirt road runs NW-SE about 200 m from the SW corner. **Topography:** Flat and slightly sloping upward from SE-NW. A shallow 10-20 m wide wash passes through E-W, near the N edge and a network of smaller washes showing 1-2 m of vertical relief also traverse the plot. **Elevation:** 3750-3770 ft. **Weather:** Clear and sunny temperatures 60-75°F, light W wind building up to moderate, gusty on last day. **Coverage:** June 18-21, 0430-0730, PST. Total man-hours: 12. **Census:** Mourning Dove, 4 (20, 8); Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1, Verdin, 1; Cactus Wren, 1; Loggerhead Shrike, 1; Black-throated Sparrow, 1; Bendire's Thrasher, 0.5; Red-tailed Hawk, +, Prairie Falcon, +; Mockingbird, +. **Total:** 11 species; 10.5 territorial males (53/km², 21/100 acres). **Remarks:** 3 Mourning Dove nests were found. Large numbers of Mourning Doves fly across the plot going to and from the water tank. The Ash-throated Flycatchers, Verdins, Cactus Wrens, and Bendire's Thrashers were usually found near the large wash near the N edge but very few birds were found in the S 1/3. Cactus Wrens, Loggerhead Shrikes, and Black-throated Sparrows were often seen in family groups with juveniles out of the nest. The Red-tailed Hawk and Prairie Falcon were seen foraging over the plot. The following species were seen but were not considered to have nesting territories: Turkey Vulture, Say's Phoebe, Horned Lark, and Brewer's Sparrow. Cattle were seen on several occasions. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — STEVEN W. CARDIFF, and LARRY LAPRE, Biology Dept., University of Calif., Riverside, Calif. 92507.

140. GRAZED CREOSOTE BUSH - YUCCA DESERT SCRUB II.

— **Location:** California; San Bernardino Co., Lanfair Valley, E Mohave Desert, 19 mi N of Goffs, NW 1/4 Sec. 19, T13N, R18E, Lanfair Valley Quadrangle, USGS; 35°12'N, 115°05'W. The SW corner is about 1.6 mi NW of the water tank located NE 1/4 Sec. 30 and is about 200 m N of

a dirt road running NW from the water tank. **Continuity:** New. **Size:** 20 ha = 49.4 acres (rectangular, 400 × 500 m, measured with steel tape, the length running N-S on a magnetic N compass grid). **Description of Plot:** Typical of large areas of the E Mohave Desert. Joshua Trees and Mohave Yuccas are widely scattered but are conspicuous and important as nesting sites. Four 100 pace toe-point transects were conducted to determine perennial plant cover and species composition. The substratum is composed of 42.75% dead plant litter, 37.25% bare ground, 14.5% small rocks (1/8 in.-3 in.), 4.75% shrub stems, and 1% large rocks (>3 in.). Perennial plant species composition was 31.25% Big Galleta Grass (*Hilaria rigida*), 19.75% Creosote Bush (*Larrea tridentata*), 10.75% Little-leaved Ratany (*Krameria parvifolia*), 8.75% Anderson Thornbush (*Lycium andersonii*), 8% Fluffgrass (*Eriogonum pulchellum*), 7.5% Goldenhead (*Acamptopappus sphaerocephalus*), 2.5% Burrobush (*Ambrosia dumosa*), 2.5% Cheesebush (*Hymenoclea salsola*), 2.25% Scale-broom (*Lepidospartum squamatum*), 1.75% Nevada Joint Fir (*Ephedra nevadensis*), 1.5% Paperbag Bush (*Salazaria mexicana*), 1% Desert Mallow (*Sphaeralcea ambigua*), 1% Ricegrass (*Oryzopsis hymenoides*), and lesser amounts of Desert Trumpet (*Eriogonum inflatum*), Dropseed (*Sporobolus cryptandrus*), Joshua Tree (*Yucca brevifolia*), Mohave Yucca (*Yucca schidigera*), and Silver Cholla (*Opuntia echinocarpa*). The canopy cover of 15.75% was composed of 53.97% Creosote Bush, 15.87% Big Galleta Grass, 7.94% Anderson Thornbush, 6.35% Little-leaved Ratany, 4.76% Goldenhead, 3.17% Mohave Yucca, and 1.59% each of Cheesebush, Scale-broom, Paperbag Bush, Nevada Joint Fir, and Cotton-top (*Echinocactus polycephalus*). Most of the dead plant litter was the result of an exceptionally heavy growth of annuals produced by large amounts of precipitation the previous winter. The annual cover was primarily composed of dense patches of Fiddleneck (*Amsinckia tessellata*) with Filaree (*Erodium cicutarium*) and several species of Buckwheat (*Eriogonum*) also present in large amounts. The plot has a long history of livestock grazing which has affected percent cover and species composition. **Edge:** Surrounded by similar habitat. A seldom-travelled dirt road runs NW-SE about 170 m from the SW corner. **Topography:** Flat and slightly sloping upward from SE-NW. A large sandy wash passes NW-SE through the N portion; elevation 3850-3870 ft. **Water:** Available at the water tanks 1.6 mi SE, and 1.5 mi NW of the plot. **Weather:** Clear and sunny, temperatures 60°-75°F, light W winds building to a moderate gusty wind on last census day. **Coverage:** June 18-21; 0430-0730, PST. Total man-hours: 12. **Census:** Mourning Dove, 3 (15, 6); Ash-throated Flycatcher, 2; Black-throated Sparrow, 2; Cactus Wren, 1.5; Verdin, 1; Loggerhead Shrike, 1; Ladder-backed Woodpecker, 0.5; Le Conte's Thrasher, 0.5; Red-tailed Hawk, +; Am. Kestrel, +; Bendire's Thrasher, +. **Total:** 11 species; 11.5 territorial males (58/km², 23/100 acres). **Remarks:** 3 Mourning Dove nests were found. The Ash-throated Flycatchers, Verdins, Cactus Wrens, Loggerhead Shrikes, and Black-throated Sparrows, all had juveniles out of the nest and were sometimes seen in family groups. The Red-tailed Hawk and Am. Kestrels were seen foraging over the

plot. The following species were seen but were not considered to have nesting territories: Com. Flicker, Say's Phoebe, Horned Lark, Blue-gray Gnatcatcher, Phainopepla, House Finch, and Brewer's Sparrow. Species composition and densities for this study and Census 139 were very similar although the birds were much more evenly distributed over this plot whereas they were mostly restricted to the vicinity of washes in Census 139. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — STEVEN W. CARDIFF, and LARRY LAPRE, Biology Dept., Univ. of Calif., Riverside, Calif. 92507.

141. INTERIOR CHAPARRAL. — **Location:** California; Solano Co., about 1 mi S of the base of Monticello Dam, in Cold Canyon; 38°30'N, 122°07'W, Mt. Vaca Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular). **Description of Plot:** Bisected from N to S by Cold Creek, a seasonal water source (flowing throughout this study). The creek was bounded by a dense growth of Live Oak (*Quercus wislizenii*) with a small representation of Buckeye (*Aesculus californica*), Maple (*Acer macrophyllum*), Cottonwood (*Populus fremontii*), Toyon (*Heteromeles arbutifolia*), Spicebush (*Calycanthus occidentalis*), and Poison Oak (*Rhus diversiloba*). The steep hillsides descending to the creek are cloaked in two separate physiognomic forms: dense and open chaparral, the former characterized by intertwining branches of adjacent shrubs, the latter by large spaces (1 to 10 m) between shrubs, with a well developed herbaceous layer. The dense chaparral, found on the lower more loamy soils, was quite heterogeneous, being comprised of Scrub Oak (*Q. dumosa*), Chamise (*Adenostoma fasciculatum*), Bay (*Umbellularia californica*), *Ceanothus* sp., Buckeye, Toyon, Live Oak and Poison Oak. The open chaparral is found on the higher, well drained sandy soils. This area is dominated by Chamise and Wild Oaks (*Avena* sp.), with a minor representation of Gray Pine (*Pinus sabiniana*), Pitcher Sage (*Lepechinia*



Census 141. Interior Chaparral. Photo/Cameron Barrows.

calycina), Toyon, and Poison Oak. In addition to these vegetation types, there are two small, open hillsides with only an herbaceous layer. The area covered by each vegetation type is as follows: Live Oak canyon bottom — 1 ha (12% of plot), dense chaparral — 4.6 ha (57%), open chaparral — 1.6 ha (20%) open hillside — 0.9 ha (11%). **Edge:** The NE and SW corners are bordered by open chaparral, the rest by dense chaparral. **Topography:** Steep canyon sides (20-30% slope); elevation 500-900 ft. **Weather:** Warm to hot, significant precipitation only in March and April. **Coverage:** Mar. 18; Apr. 2, 16, 22-23, 29; May 1, 12-13, 20; June 3, 10, 0600-1300 hours. Total man-hours: 72. **Census:** Orange-crowned Warbler, 6 (74, 30), Anna's Hummingbird, 3 (37, 15); Com. Bush-tit, 3; Bewick's Wren, 3; Rufous-sided Towhee, 3; Wrentit, 2; Blue-gray Gnatcatcher, 2, Mourning Dove, 1.5; Brown Towhee, 1.5, Calif. Quail, 1; Screech Owl, 1; Ash-throated Flycatcher, 1; Scrub Jay, 1; Plain Titmouse, 1, Hutton's Vireo, 1; Black-headed Grosbeak, 1, Lesser Goldfinch, 1; Mountain Quail, 0.5, Calif. Thrasher, 0.5; Warbling Vireo, 0.5 **Total:** 20 species; 34.5 territorial males or females (426/km², 173/100 acres). **Visitors:** Turkey Vulture, Cooper's Hawk, Red-tailed Hawk, Black Phoebe, W. Wood Pewee **Remarks:** Nests found: Plain Titmouse and Black-headed Grosbeak. With the exception of the non-passerines, the Hutton's Vireo and multiple broods of several species, all birds fledged young between May 20 and June 3. This synchrony is undoubtedly related to the harshness of the chaparral environment. The high number of Orange-crowned Warblers may be related to the relatively mesic conditions of this dense chaparral; all their territories were completely contained in the dense chaparral or with slight overlap in the Live Oak canyon bottom. Special thanks to Katherine Barrows for help in the vegetation analysis. — CAMERON BARROWS, 3162 Yellowtail Dr., Los Alamitos, Calif. 90720.

142. IRONWOOD - SMOKETREE DESERT WASH. — **Location:** California; San Bernardino Co., Vidal Wash in Vidal Valley about 5.5 mi E and 6.5 mi S of Vidal Junction on US Hwy 95. The W boundary begins in the SE ¼ of Sec. 8, T1S, R24E, Parker Quadrangle, USGS; 34°06'N, 114°29'W. **Continuity:** New. **Size:** 18.6 ha = 45.9 acres (rectangular 675 by 275 m, paced). **Description of Plot:** See AB 33:1 (WBPS 82). **Weather:** Temperatures 50°-115°F; no precipitation was recorded. **Coverage:** Mar. 24-25; Apr. 8, 22, 23; May 14; June 6-7; 0520-0900. Total man-hours: 23. **Census:** Verdin, 5 (27, 11); Black-tailed Gnatcatcher, 4 (22, 9); Ash-throated Flycatcher, 2; Ladder-backed Woodpecker, 1, Loggerhead Shrike, 1; Lucy's Warbler, 0.5 **Total:** 6 species; 13.5 territorial males (73/km², 29/100 acres). **Visitors:** Gambel's Quail, Mourning Dove, Lesser Nighthawk, Tree Swallow, Bank Swallow, Mockingbird, Yellow-rumped (Myrtle & Audubon's) Warbler, MacGillivray's Warbler, Wilson's Warbler, Brown-headed Cowbird, House Finch, Black-throated Sparrow, Brewer's Sparrow, White-crowned Sparrow. **Remarks:** Nests found: Verdin, 1; Black-tailed Gnatcatcher, 1. The following juveniles were seen: Verdin, 7, Loggerhead Shrike, 3; Black-tailed Gnatcatcher, 2; Lucy's Warbler, 1. This study was sponsored by the Bureau of Land Manage-

ment, California Desert Plan Program — BRIAN E. DANIELS and JEFF BOYD, 3471 Lama, Long Beach, Calif. 90808.

143. JOSHUA TREE WOODLAND I. — **Location:** California; San Bernardino Co., 2 mi N and 0.7 mi W of Cima. The SW corner is at the BLM Bearing Tree for Sec. 29, 22 m E of Cima Rd., SW 1/4 Sec. 29, T14N, R14E, Mescal Range Quadrangle, USGS; 35°16'N, 115°30'W. **Continuity:** Established 1977. **Size:** 9 ha = 22.2 acres. **Description of Plot:** See AB 30 1060-1061 (1976). **Weather:** Clear and sunny during censuses, temperatures 55°-70°F, usually with a light wind from N or W. No precipitation, although the study was delayed till late April by stormy weather. **Coverage:** Apr. 23, 30; May 7, 11, 13, 22, 27-28, between 0500-0930 PST. Total man-hours: 24. **Census:** Black-throated Sparrow, 4 (45, 18); Ash-throated Flycatcher, 1; Loggerhead Shrike, 1; Com. Flicker, 0.5; Ladder-backed Woodpecker, 0.5; Cactus Wren, 0.5; Red-tailed Hawk, +; Am. Kestrel, +. **Total:** 8 species; 7.5 territorial males (83/km², 34/100 acres). **Remarks:** 3 Black-throated Sparrow nests were found. Cactus Wrens were seen with juveniles out of the nest. The following species were seen but were not considered to have nesting territories: Turkey Vulture, Mourning Dove, and House Finch; 5 species of migrants were also recorded. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — STEVEN W. CARDIFF and EUGENE A. CARDIFF, San Bernardino County Museum, 2024 Orange Tree Ln., Redlands, Calif. 92373.

144. JOSHUA TREE WOODLAND II. — **Location:** California; San Bernardino Co., Lanfair Valley, 5.4 mi N of Cedar Cyn Rd., 2.8 mi E of Ivanpah Rd.; in the NW 1/4 of Sec. 9, T13N, R17E, Lanfair Valley Quadrangle, USGS. **Continuity:** New. **Size:** 20 ha = 49.42 acres (rectangular 500 × 400 m, measured). **Description of Plot:** A typical Joshua Tree Woodland community of the N portion of the valley. Joshua trees are scattered over the plot with a concentration near the middle of the W edge. **Vegetation:** Five 100 toe-point transects were made to determine percent cover and species composition. The substrata consisted of 40.6% bare ground, 30.4% litter, 14.2% small rocks (<5 cm), 12.2% scrub stems and 2.6% large rocks (>5 cm). Small and large shrubs and perennial grasses formed a canopy cover and ground cover of 21.8%. Composition of perennial plants included 41.0% Galleta Grass (*Hilaria rigida*), 11.4% Cooper's Goldenbush (*Haplopappus cooperi*), 9% Burrobush (*Ambrosia dumosa*), 7.2% Hop-Sage (*Grayia spinosa*), 5.4% Creosote Bush (*Larrea tridentata*), 5% Matchweed (*Gutierrezia microcephala*), 3% Desert Mallow (*Sphaeralcea ambigua*), 2.8% Goldenhead (*Acamptopappus sphaerocephalus*), 2% Cheese Bush (*Hymenoclea salsola*), 1.4% each of Woolly-fruited Burbush (*Ambrosia eriocentra*) and *Hoffmanseggia densiflora*, 1.2% each of Winter Fat (*Eurotia lanata*), Mormon Tea (*Ephedra nevadensis*), and Little-leaved Ratany (*Krameria parvifolia*). The area has a long history of livestock grazing, which probably has affected the composition of the understory. It has not been grazed this year. **Edge:** Bounded on all sides by Joshua Tree

Woodland with a wide but shallow wash near the E side and a dirt road that had not been used for a few years running approximately 25-75 m to the S. **Topography:** Basically flat with moderately wide but shallow wash running from the NW to the SE across the S half. **Elevation:** 4180 ft. **Water:** The nearest permanent water sources are livestock watering troughs and tank 1.2 mi SW and 1 mi E of the plot. **Weather:** Temperatures 57-91°F. No precipitation was recorded. **Coverage:** June 11, 15, 22, 24-25, 27, 29-30; 0430-0900, PST. Total man-hours: 27.5. **Census:** Mourning Dove, 7 (35, 14); Black-throated Sparrow, 5.5 (27, 11); Gambel's Quail, 2; Ash-throated Flycatcher, 2; Mockingbird, 2; Loggerhead Shrike, 2; Cactus Wren, 1.5; Le Conte's Thrasher, 1; Scott's Oriole, 1; Horned Lark, 0.5; Bendire's Thrasher, 0.5; Red-tailed Hawk, +; Com. Flicker, +. **Total:** 13 species; 25 territorial males or females (125/km², 51/100 acres). **Visitors:** Turkey Vulture, Am. Kestrel, Ladder-backed Woodpecker, Say's Phoebe, Com. Raven, Verdin, Mountain Bluebird, W. Meadowlark, House Finch, Black-chinned Sparrow, Brewer's Sparrow. **Remarks:** 8 active nests were found: 5 Mourning Dove, 1 each of Ash-throated Flycatcher, Cactus Wren and Horned Lark. Two evenings were spent listening and watching for owls and goatsuckers without success. The count of Mourning Doves is the average number of pairs observed but is probably close to the real number of breeding pairs because 5 active nests were found. We thank Ruth C. Yoder and Roland H. Wissler for assistance. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — BARBARA A. CARLSON and SHELDON J. NEWBERGER, 978-A Springfield Ave., Upland, Calif.

145. JOSHUA TREE WOODLAND III. — **Location:** California; San Bernardino Co., Lanfair Valley, 5.3 mi N of Cedar Cyn Rd., 4 mi E of Ivanpah Rd.; in the E 1/2 of the NW 1/4 and W 1/2 of the NE 1/4 of Sec. 10, T13N, R17E, Lanfair Valley Quadrangle, USGS; 35°14'N, 115°8'W. The NW corner is approximately 75 m S and 110 m W of the USGS Sec. 3/Sec. 10 1/4 marker. **Continuity:** New. **Size:** 20 ha = 49.42 acres (rectangular 500 × 400 m, measured). **Description of Plot:** Typical Joshua Tree Woodland that is found in the N portion of the valley. **Vegetation:** Five (5) 100 toe-point transects were made to determine percent cover and species composition. The substrata consisted of 48.6% bare ground, 36.0% litter, 9.2% small rocks (<5 cm), 4.2% shrub stems and 2.0% large rocks (>5 cm). Small and large shrubs and perennial grasses formed a canopy cover and ground cover of 16.8%. Composition of perennial plants included 29% Galleta Grass (*Hilaria rigida*), 15.2% Little-Leaved Ratany (*Krameria parvifolia*), 9.2% Creosote Bush (*Larrea tridentata*), 7.6% Goldenhead (*Acamptopappus sphaerocephalus*), 7.2% Cheese Bush (*Hymenoclea salsola*), 5.2% Black-banded Rabbit Brush (*Chrysothamnus paniculatus*), 4.8% Hop-Sage (*Grayia spinosa*), 3% Mormon Tea (*Ephedra nevadensis*), 2.8% Cooper Goldenbush (*Haplopappus cooperi*), 2.4% Woolly-fruited Burbush (*Ambrosia eriocentra*), 2% Wild-Rhubarb (*Rumex hymenosepalus*), 1.8% Burro-bush (*Ambrosia dumosa*), 1.6% Rice-grass (*Oryzopsis hymenoides*), 1% each of

Desert Mallow (*Sphaeralcea ambigua*), and Buckhorn Cholla (*Opuntia acanthocarpa*). The area has a long history of livestock grazing, which probably has affected the composition of the understory. It has not been grazed this year. **Edge:** Bounded on all sides by Joshua Tree Woodland community; a dirt road 75-100 m S of the plot is frequently used by local ranchers. **Topography:** Basically flat with one wide but shallow wash extending from the NW to the SE in the southern half. **Elevation:** 4100 ft (1250 m). **Water:** The nearest permanent water is a livestock water tank approximately 150 m S of the SW corner. **Weather:** Temperatures 57-91°F with no precipitation recorded. **Coverage:** June 10, 14, 21, 23-24, 26, 28, 30; 0445-1000, PST. Total man-hours: 29. **Census:** Mourning Dove, 8 (40, 16); Black-throated Sparrow, 4.5 (22, 9), Ash-throated Flycatcher, 2.5; Verdin, 2; Cactus Wren, 2; Gambel's Quail, 1.5; Mockingbird, 1.5; Loggerhead Shrike, 1.5; Bendire's Thrasher, 1; Le Conte's Thrasher, 1; Black-tailed Gnatcatcher, 1; House Finch, 1; Brewer's Sparrow, 1; Com. Flicker, 0.5; Red-tailed Hawk, +; Am. Kestrel, +; Ladder-backed Woodpecker, +; W. Kingbird, +; Brown-headed Cowbird, +. **Total:** 19 species; 29 territorial males or females (145/km², 59/100 acres). **Visitors:** Turkey Vulture, Swainson's Hawk, Golden Eagle, Lesser Nighthawk, Say's Phoebe, Horned Lark, Cliff Swallow, Lark Bunting. **Remarks:** 3 active nests were found 1 each of Ash-throated Flycatcher, Cactus Wren and House Finch. A nest, believed to be the Red-tailed Hawk's, was also found. The following were observed feeding fledglings just out of the nest; Ladder-backed Woodpecker, W. Kingbird, Ash-throated Flycatcher, Verdin, Black-tailed Gnatcatcher (feeding fledgling Brown-headed Cowbird), Black-throated Sparrow, Brewer's Sparrow. A Lesser Nighthawk was observed on one evening. Poor-wills were observed within 0.5 mi of the plot and probably use the area. The Mourning Dove count is average number of pairs observed and may be incorrect as doves were flying from surrounding area to the water tank near the SW corner. We thank Ruth C. Yoder and Roland H. Wissler for assistance. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — BARBARA A. CARLSON, and SHELDON J. NEWBERGER, 978-A Springfield Ave., Upland, Calif.

146. MESQUITE COMMUNITY. — **Location:** California; Inyo Co., S tip of Resting Springs Range; 5.2 mi ENE of the Tecopa Post Office; in the SE 1/4 of Sec. 31, T21N, R8E, Tecopa Quadrangle, USGS; 35°53'N, 116°10'W. **Continuity:** New. **Size:** 12.6 ha = 31.13 acres (irregular, approximately 560 × 225 m, paced). **Description of Plot:** See AB 33 1 (WBPS 86). **Weather:** Temperatures 40-104°; 6.9 cm (2.71 in.) of rainfall recorded. **Coverage:** Apr. 13, 15, 17, 19; May 11, 13, 15, June 29; (mostly 0530-0930). Total man-hours: 30. **Census:** Verdin, 11 (87, 35); Lucy's Warbler, 9 (71, 29); Bewick's Wren, 7 (56, 22); Gambel's Quail, 4 (32, 13); Mourning Dove, 4; Crissal Thrasher, 4; Black-tailed Gnatcatcher, 4; Brown-headed Cowbird, 3 (24, 10); Blue Grosbeak, 1; Am. Kestrel, +; Roadrunner, +, Lesser Nighthawk, +; Ash-throated Flycatcher, +; Com. Raven, +. **Total:** 14 species; 47 territorial males (373/km², 151/100 acres)

Visitors: (Total numbers recorded on eight censuses) Turkey Vulture, 2, *Accipiter* sp., 1, Say's Phoebe, 1; W. Flycatcher, 2; *Empidonax* sp., 1; W. Wood Pewee, 5; Vermilion Flycatcher, 1; Violet-green Swallow, 3; Rock Wren, 3; Ruby-crowned Kinglet, 1; Orange-crowned Warbler, 2; Yellow Warbler, 5; Yellow-rumped Warbler, 16; Townsend's Warbler, 1; Wilson's Warbler, 3; N. Oriole, 2; W. Tanager, 1; Black-headed Grosbeak, 1; Lazuli Bunting, 6; Black-throated Sparrow, 2; White-crowned Sparrow, 32. **Remarks:** As well as supporting a rather diverse breeding population, it is apparent from the list of visitors that this area is an important stop-over for migrants. The shelter that this habitat provides may result from the proximity of water at Resting Springs and the density of the foliage (in contrast to the sparsity of the surrounding shrub). Nests of one Lucy's Warbler and two Verdins were found. Newly fledged juveniles of Gambel's Quail, Verdin, Bewick's Wren, Crissal Thrasher, Black-tailed Gnatcatcher, and Lucy's Warbler were observed. Thanks to Ken Smith for weather data and Meryl Evens for field assistance. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — JULES EVENS, Box 59, Pt. Reyes Station, Calif. 94956.

147. MESQUITE FOREST. — **Location:** California; Inyo Co., Salt Lake, Saline Valley, Sec. 27, T14S, R38E, New York Butte Quadrangle, USGS; 36°42'N, 117°49'W. **Continuity:** New. **Size:** 24.3 ha = 60 acres. **Description of Plot:** See AB 33:1 (WBPS 60). **Weather:** 3.6 in of rain were measured at Willow Creek Camp 10 mi NW from Jan. 10 to Apr. 7. **Coverage:** Mar. 21, 24; Apr. 6, 8, 27; May 7, 11, 12; 0600-1100 and 1700-1900. Total man-hours: 29. **Census:** Blue-gray Gnatcatcher, 28 (115, 47); Bewick's Wren, 12 (49, 20); Brown-headed Cowbird, 5 (21, 8); Lesser Goldfinch, 3 (12, 5); Mourning Dove, 2; Black-chinned Hummingbird, 1; Ash-throated Flycatcher, 1; White-throated Swift, +; Com. Raven, +. **Total:** 9 species; 52 territorial males (214/km², 87/100 acres). **Visitors:** (total number observed): Yellow-rumped Warbler, 67; Ruby-crowned Kinglet, 61; Wilson's Warbler, 61; Orange-crowned Warbler, 32; Barn Swallow, 17; White-crowned Sparrow, 17; Yellow Warbler, 8; Nashville Warbler, 7; W. Flycatcher, 5; Am. Robin, 5; Com. Yellowthroat, 5; Black-headed Grosbeak, 5; Lincoln's Sparrow, 5; Black-throated Gray Warbler, 4; Brewer's Blackbird, 4; Violet-green Swallow, 3; Le Conte's Thrasher, 3; W. Kingbird, 2; Townsend's Solitaire, 2; Cedar Waxwing, 2; Solitary Vireo, 2; Townsend's Warbler, 2; Lazuli Bunting, 2; House Finch, 2; Green-tailed Towhee, 2; Black-throated Sparrow, 2; Brewer's Sparrow, 2; *Empidonax* sp., 1; Dusky Flycatcher, 1; Gray Flycatcher, 1; W. Wood Pewee, 1; Rock Wren, 1; Bendire's Thrasher, 1; Warbling Vireo, 1; MacGillivray's Warbler, 1; W. Tanager, 1; Sage Sparrow, 1; White-throated Sparrow, 1. **Remarks:** Nests found: Blue-gray Gnatcatcher, 1. On Mar. 24, 0% of the Mesquite trees had leafed out, but by April 6, 60% had leafed out. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. PRBO Contribution No. 180. — ROBERT M. STEWART, Point Reyes Bird

Observatory, 4990 Shoreline Highway, Stinson Beach, Calif 94970

148. MOHAVE YUCCA - STAGHORN CHOLLA DESERT SCRUB. — **Location:** California; San Bernardino Co., SW edge of Lanfair Valley, 4.5 mi S and 1 mi E of intersection of Ivanpah and Cedar Canyon Rds; roughly parallel to Ivanpah Rd. (the SW corner is about 400 m NW of where Ivanpah Rd. crosses Fenner Wash); NE ¼ Sec. 5, T11N, R17E, Lanfair Valley Quadrangle, USGS; 35°04'N, 115°10'W. **Continuity:** Established 1977. **Size:** 20 ha = 49.42 acres. **Description of Plot:** See AB 32:102 (1978). **Weather:** Clear and sunny on all censuses, temperatures 55°-80°F, usually with a light to moderate W or N wind. No precipitation recorded. **Coverage:** Apr. 22; May 3, 10, 12, 14, 21, 27-28; 0500-0900, PST. Total man-hours: 24. **Census:** Mourning Dove, 7 (35, 14); Gambel's Quail, 3 (15, 6); Cactus Wren, 2.5; Ash-throated Flycatcher, 1.5; Screech Owl, 1; Ladder-backed Woodpecker, 1; Black-throated Sparrow, 1; Say's Phoebe, 0.5; Bendire's Thrasher, 0.5; Mockingbird, +; Le Conte's Thrasher, +; Loggerhead Shrike, +. **Total:** 12 species; 18 territorial males (90/km², 36/100 acres). **Remarks:** 3 Mourning Dove nests were found; numerous individuals were seen flying across the plot going to and from the water tank to the S; 1 Ash-throated Flycatcher and 1 Bendire's Thrasher nest was found. Cactus Wrens, Black-throated Sparrows, Say's Phoebes, Le Conte's Thrashers, and Loggerhead Shrikes were seen with juveniles out of the nest. Scott's Orioles were seen twice but did not appear to nest. House Finches were occasionally seen flying over. The large increase in density is largely due to the presence of the Mourning Doves, which may have been encouraged by large amounts of precipitation during the previous winter resulting in healthier perennial plants and a heavy growth of annuals. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — STEVEN W. CARDIFF, San Bernardino Co. Museum, 2024 Orange Tree Ln., Redlands, Calif. 92373.

149. OCOTILLO - CHOLLA. — **Location:** California; Riverside Co., Santa Rosa Mtns., about 5.5 mi S of State Hwy 74/State Hwy 111 junction in Palm Desert, beginning E of Hwy 74; in the NE ¼ Sec. 18, T6S, R6E, Palm Desert Quadrangle, USGS, and extending into the SE ¼ Sect. 7, SW ¼ Sect. 8 and NW ¼ Sec. 17; 33°40'N, 116°25'W. **Continuity:** New. **Size:** 16.2 ha = 40 acres, (rectangular 540 m × 300 m, measured). **Description of Plot:** See AB 33:1 (WBPS 61). **Weather:** Temperatures 46-102°F. Occasional light rains occurred (less than 0.5 in.), however, there had been heavy rains this past winter and spring, leaving more than normal moisture. **Coverage:** Mar. 11, 24; Apr. 2, 8, 23, 30; May 6, 14; 0445-1045, PST. Total hours: 30.5. **Census:** Black-throated Sparrow, 10.5 (65, 26); Costa's Hummingbird, 6.5 (40, 16); Rock Wren, 6 (37, 15); Mourning Dove, 4 (25, 10); House Finch, 4; Verdin, 1; Scott's Oriole, 1; Lesser Goldfinch, 1; Loggerhead Shrike, 0.5; Red-tailed Hawk, +; Great Horned Owl, +; Com. Raven, +. **Total:** 12 species; 34.5 territorial males or females (213/km², 86/100 acres). **Visitors** (numbers indicate total number observed): Ash-throated Fly-

catcher, 7; White-throated Swift, 5; Phainopepla, 5; Cactus Wren, 3; Say's Phoebe, 2; Roadrunner, 1; Bewick's Wren, 1. **Remarks:** 12 nests were found: Rock Wren, 3; Loggerhead Shrike, 1; House Finch, 1; Black-throated Sparrow, 7. The Red-tailed Hawk, White-throated Swifts and Com. Ravens, seen hunting and foraging over the plot probably nest in nearby cliffs. One Great Horned Owl was observed; it appears that it may be nesting in the arroyo just S of the plot. I thank Ruth C. Yoder for assistance with the surveys. This survey was sponsored by the Bureau of Land Management, California Desert Plan Program. — BARBARA A. CARLSON, P.O. Box 1015, Upland, Calif. 91786.

150. PALOVERDE DESERT WASH. — **Location:** California; San Bernardino Co., Chemehuevi Wash in Chemehuevi Valley, about 18 mi N of Vidal Junction on US Hwy 95. The W boundary is about 200 m E of Hwy 95; begins in the NE ¼ of Sec. 15, T4N, R22E, Savahia Peak Quadrangle, USGS; 34°26'N, 114°39'W. **Continuity:** New. **Size:** 15.75 ha = 38.92 acres (rectangular 700 × 225 m, paced). **Description of Plot:** See AB 33:1 (WBPS 81). **Weather:** Temperatures 50°-115°F; no precipitation was recorded. **Coverage:** Mar. 24-25; Apr. 9, 22-23; May 13; June 6-7; 0500-0830. Total man-hours: 23. **Census:** Mourning Dove, 8 (51, 21); Verdin, 6 (38, 15); Black-tailed Gnatcatcher, 4 (25, 10); Phainopepla, 2.5; Gambel's Quail, 2; Lucy's Warbler, 2; Ash-throated Flycatcher, 1.5; Costa's Hummingbird, 1; Loggerhead Shrike, 1; Ladder-backed Woodpecker, 0.5. **Total:** 10 species; 28.5 territorial males and females (181/km², 73/100 acres). **Visitors:** Sharpshinned Hawk, Red-tailed Hawk, Roadrunner, White-throated Swift, Hammond's Flycatcher, Gray Flycatcher, W. Flycatcher, Sage Thrasher, Yellow Warbler, MacGillivray's Warbler, Wilson's Warbler, Brown-headed Cowbird, House Finch, Savannah Sparrow, Black-throated Sparrow, Chipping Sparrow, Brewer's Sparrow, White-crowned Sparrow. **Remarks:** Nests found: Black-tailed Gnatcatcher, 1; Phainopepla, 1; Loggerhead Shrike, 1. A flock of approximately 40 young quail were observed feeding. Other juveniles seen were Black-tailed Gnatcatcher, 4; Loggerhead Shrike, 4; Verdin, 3. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — BRIAN E. DANIELS and JEFF BOYD, 3471 Lama, Long Beach, Calif. 90808.

151. SAGEBRUSH SCRUB I. — **Location:** California; Inyo Co., 0.5 mi E of Waucoba Spring, 21.2 mi SE of Big Pine; along Saline Valley Rd.; Sec. 9, T11S, R37E, Waucoba Spring Quadrangle, USGS; 37°00'N, 117°57'W. **Continuity:** Established 1977. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 32:104 (1978). **Weather:** 3.6 in. of rain were recorded 12 mi S at Willow Creek Camp from Jan. 10 to Apr. 7. **Coverage:** Mar. 22-23; Apr. 25, 28-29; May 6, 10, 13; 0600-0900 and 1700-1900. Total man-hours: 28. **Census:** Brewer's Sparrow, 12 (60, 24); Black-throated Sparrow, 6 (30, 12); Rock Wren, 2; Sage Sparrow, 2; House Finch, 1; Com. Raven, +. **Total:** 6 species; 23 territorial males (115/km², 47/100 acres). **Visitors** (total number observed): Mountain Bluebird, 8; Yellow-rumped Warbler, 8; White-crowned Sparrow,

6, Green-tailed Towhee, 5, Blue-gray Gnatcatcher, 2, Killdeer, 1, Mourning Dove, 1, Poor-will, 1; W. Kingbird, 1; Say's Phoebe, 1; Gray Flycatcher, 1; Horned Lark, 1; Bewick's Wren, 1; Am. Robin, 1; Mountain Bluebird, 1, Ruby-crowned Kinglet, 1; Yellow-rumped Warbler, 1; W. Meadowlark, 1; Chipping Sparrow, 1. **Remarks:** Nests found: Sage Sparrow, 2; Brewer's Sparrow, 2. Brewer's and Black-throated Sparrows were not observed in last year's census but were abundant this year. No feral burros were seen this year in contrast to last year. The above-average precipitation and consequent growth of shrubs in Saline Valley this spring allowed the burros to scatter rather than concentrate at Waucoba Spring as in the last two drought years. This area was picked for long-term study by BLM to measure the effects of burros on sagebrush habitat. Last year it had half as many birds as the control plot (Census 152); this year it had more than twice as many as the control plot. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. Contribution No. 178 PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, Calif. 94970.

152. SAGEBRUSH SCRUB II. — **Location:** California; Inyo Co., 1/2 mi N of Marble Canyon, SE of Big Pine, 6 mi from beginning N end of Saline Valley Road, Sec. 6, T10S, R37E, Waucoba Spring Quadrangle, USGS; 37°5'N, 118°00'W. **Continuity:** Established 1977. **Size:** 21 ha = 51.9 acres. **Description of Plot:** See AB 32:104 (1978). **Weather:** At least one snow storm occurred during the period. **Coverage:** Mar. 19-20; Apr. 5, 30; May 2-3, 9, 14; 0600-0900 and 1700-1900. Total man-hours: 28. **Census:** Brewer's Sparrow, 5 (24, 10), Black-throated Sparrow, 2; Loggerhead Shrike, 1; Sage Thrasher, 0.5; Sage Sparrow, 0.5, Com. Raven, +. **Total:** 6 species; 9 territorial males (43/km², 17/100 acres). **Visitors** (numbers indicate the total number observed): Piñon Jay, 43; Mountain Bluebird, 4; Horned Lark, 3; House Finch, 2; Calliope Hummingbird, 1; Rock Wren, 1. **Remarks:** Nests found: Loggerhead Shrike, 1, Brewer's Sparrow, 1; Sage Sparrow, 1. Brewer's and Black-throated Sparrows were not present during last year's census, possibly because of drought conditions. Their presence this year could be due to the above-average winter and spring precipitation. The study was sponsored by the Bureau of Land Management, California Desert Plan Program. Contribution No. 179 PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, Calif. 94970.

153. SALTBUSSH COMMUNITY. — **Location:** California; San Bernardino Co., 36 mi SE of Cadiz, 0.5 mi W of the Milligan salt processing plant of Standard Salt Co. Plot borders the road between the salt plant and the salt evaporators on the N, and the dunes on the E; in the NE 1/4 of Sec. 13, T2N, R11E, Milligan Quadrangle, USGS; 34°16'N, 115°09'W. **Continuity:** New. **Size:** 12.26 ha = 30.3 acres (1100 x 1200 ft, measured). **Description of Plot:** A flat, sparsely vegetated dry lake bed. See AB 33:1 (WBPS 66). **Weather:** Temperatures during the period were 60-120°F, (average 90°).

Winds 10-15 knots common **Coverage:** Apr 6-7, 27-28, May 13, 20-21, June 12, 0500-1100 and 1330-2230, average three hours per visit. **Census:** No birds nested. **Visitors:** Say's Phoebe, Loggerhead Shrike, Black-throated Sparrow. **Remarks:** The area of similar habitat for 1 mi on 3 sides of the plot also did not appear to have any nesting birds. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — M. FOSTER and D. JOHNSTON, 99 S. 12th St., San Jose, Calif. 95112.

154. SALTBUSSH - EUROTIA DESERT. — **Location:** California; San Bernardino Co., Superior Dry Lake; situated 100 yards SE of Superior Dry Lake; the NE border is adjacent to road to Crutts Well; in the NE 1/4 of Sec. 20, T31S, R46E of the Opal Mountain Quadrangle, USGS; 35°13'N, 117°4'W. **Continuity:** New. **Size:** 36 ha = 88.96 acres (square, 600 X 600 m, paced). **Description of Plot:** See AB 33:1 (WBPS 63). **Vegetation:** Perennial species found, not previously described, were Desert Aster (*Machaeranthera tortifolia*), Hole-in-the-Sand (*Nicolletia occidentalis*), Hedgehog Cactus (*Echinocereus engelmannii*), Alkali Weed (*Cressa truxillensis* var. *vallicola*), and Locoweed (*Astragalus lentiginosus*). **Water:** Superior Lake contained water through most of the period. **Weather:** Skies clear on 7 days, cloudy on 1; winds over 20 mph on 1 day, light wind on 2, no wind on 5. Only trace precipitation fell during the period; temperature ranged from 34-102°F. **Coverage:** Apr. 25, 27; May 4, 9, 11, 17, 25; June 2; between 0615-1020 and 1955-2200, PDST. Total man-hours: 29.8. **Census:** Horned Lark, 9 (25, 10); Sage Sparrow, 8 (22, 9); Brewer's Sparrow, 2; Mourning Dove, +; Le Conte's Thrasher, +; White-crowned Sparrow, +. **Total:** 6 species; 19 territorial males (53/km², 21/100 acres). **Remarks:** Sheep are brought into Superior Valley to graze each spring; this year from Apr. 24 to June 1. Sometime between May 17-23 sheep were foraging over the entire plot. Two Sage Sparrow nests were found. Immature Sage Sparrows were seen on June 2. Mourning Doves were observed drinking at the lake and 25 Ring-billed Gulls, 9 Semipalmated Sandpipers and 1 Killdeer were seen foraging at the lake. Annual growth this year was extremely heavy and large numbers of grasshoppers were seen. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — ROSS E. LANDRY, 6822 Westminster Ave., #43 Westminster, Calif. 92683.

155. SHADSCALE SCRUB. — **Location:** California; Inyo Co., 2.5 mi NW of Deep Springs Lake in Deep Springs Valley, 21 mi E of Big Pine along Highway 95, Sec. 19, T7S, R36E, Blanco Mt. Quadrangle, USGS; 37°19'N, 118°04'W. **Continuity:** New. **Size:** 27 ha = 66.7 acres (900 m long x 300 m wide, paced). **Description of Plot:** See AB 33:1 (WBPS 78). **Vegetation:** Boxthorn (*Lycium andersonii*) should be added to the plant list. Also *Sphaeralcea* sp. listed in the original description of the plot should be changed to Apricot Mallow (*S. ambigua*). **Weather:** 4 in. of rain were recorded Jan. 1-June 1, 6 mi NE at Deep Springs College. **Coverage:** Mar. 17-18; Apr. 3; May 1, 4-5, 8, 15; 0600-0900

and 1700-1900 Total man-hours 28 **Census:** Black-throated Sparrow, 12 (44, 18), Brewer's Sparrow, 5 (19, 8); Horned Lark, 2; Loggerhead Shrike, 1; Com. Raven, +. **Total:** 5 species; 20 territorial males (74/km², 30/100 acres). **Visitors** (total number observed) Violet-green Swallow, 7; Barn Swallow, 5, Mountain Bluebird, 4; House Finch, 2; Am Kestrel, 1; W. Wood Pewee, 1; Cliff Swallow, 1; Tree Swallow, 1; Rough-winged Swallow, 1; Blue-gray Gnatcatcher, 1; N. Oriole, 1; White-crowned Sparrow, 1. **Remarks:** Nest found: Black-throated Sparrow, 1. Black-throated Sparrows, not present during the winter, were present on Mar. 17. The study was sponsored by the Bureau of Land Management, California Desert Plan Program Contribution No. 181 PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, 4900 Shoreline Highway, Stinson Beach, Calif. 94970.

156. YUCCA-CREOSOTE COMMUNITY I. — **Location:** California; San Bernardino Co., Lanfair Valley, 17 mi E of Cima, SE 1/4 of Sec. 31, T13N, R17E, of Lanfair Valley Quadrangle, USGS; 35°10'N, 115°05'W. **Continuity:** New. **Size:** 12.26 ha = 30.3 acres (1100 by 1200 ft, measured). **Description of Plot:** A community dominated by *Yucca* (2 species) and Creosote Bush (*Larrea tridentata*), with diverse, fairly dense vegetation. A small, branched wash runs NW from the S border; with Catclaw Acacia (*Acacia greggii*) the dominant plant in the washes. Grasses are moderately abundant and the plot is used for grazing. **Vegetation:** Five 100-point pace transects were made to determine % cover and species of perennials. **Substrate:** Litter, 49.8%; sand, 30.8%; bare ground, 14.0%; rock, 3.4%; Galleta Grass (*Hilaria rigida*) 0.6%; Anderson Thorn Bush (*Lycium andersonii*), 0.6%; Creosote Bush, 0.4%. **Perennial species:** Galleta Grass, 46.6%; Creosote Bush, 20.6%; Goldenhead (*Acamptopappus sphaerocephalus*), 10.4%; Boxthorn (*Lycium cooperi*), 4.6%; White Ratany (*Krameria grayii*), 4.2%; Burrobush (*Ambrosia dumosa*), 3.0%; Cheese Bush (*Hymenoclea salsola*), 2.2%; Paper Flower (*Psilostrophe cooperi*), 1.4%; Bladder Sage (*Salazaria mexicana*), 1.4%; Desert Mallow (*Sphaeralcea ambigua*), 1.2%; Gray Ball Sage (*Salvia dorrii*), 1.2%; Buckthorn Cholla (*Opuntia acanthocarpa*), 0.8%; Bald-leaved Felt Thorn (*Tetradymia glabrata*), 0.6%; Pinyon Wormwood (*Artemisia ludoviciana*), 0.6%; Narrow-scaled Felt Thorn (*Tetradymia stenolepis*), 0.6%; Catclaw Acacia, 0.4%; *Yucca schidigera*, 0.4%; California Buckwheat (*Eriogonum fasciculatum*), 0.2%; Beavertail Cactus (*Opuntia basilaris*), 0.2%. **Edge:** Surrounded on four sides by similar habitat. **Topography:** Flat except in wash areas. **Elevation:** 3720 ft. Nearest mountains are Piute Mountains, 6 mi E. **Water:** Nearest water is in a guzzler, 100 ft to the S. **Weather:** Temperatures about 53-100°F, (average 85°). Winds were 5-25 knots, usually blowing a steady 10-15 knots during the day. **Coverage:** June 12, 14, 20, 22, 27, 20-30; 8 trips between dawn and 1100 averaged 3 hours each, plus five afternoon and evening visits between 1300 and 2000. Total hours: 39. **Census:** Mourning Dove, 3 (24, 10), Black-throated Sparrow, 2.5 (19, 8); Ash-throated Flycatcher, 2; Say's Phoebe, 1; Verdin, 1; Cactus Wren, 1; Mockingbird, 1; Log-

gerhead Shrike, 1, Sage Sparrow, 1, Gambel's Quail 0.5, Le Conte's Thrasher, 0.5 **Total:** 11 species; 14.5 territorial males (118/km², 48/100 acres). **Visitors:** Red-tailed Hawk, Costa's Hummingbird, Cassin's Kingbird, Scott's Oriole. **Remarks:** This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *M. FOSTER and D. JOHNSTON, 99 S. 12th Street, San Jose, Calif. 95112.*

157. YUCCA-CREOSOTE COMMUNITY II. — **Location:** California; San Bernardino Co., Lanfair Valley, 17 mi E of Cima, NE ¼ of Sec. 31, T13N, R17E, of Lanfair Valley Quadrangle, USGS; 35°10'N, 115°05'W. **Continuity:** New. **Size:** 12.26 ha = 30.3 acres (1100 by 1200 ft, measured). **Description of Plot:** A diversely vegetated community dominated by two species of Yucca and Creosote Bush (*Larrea tridentata*). An extensively branched wash system occupies the N 1/3 of the plot; Catclaw Acacia (*Acacia greggii*) predominates in the washes. Cattle graze on the plot. Vegetation: Five 100-pnt pace transects were made to determine % cover and species of perennials. Substrate: Litter, 51.8% (including annuals); bare ground, 24.6%; sand, 19.2%; Galleta Grass (*Hilaria rigida*), 1.4%; rock, 1.2%; White Ratany (*Krameria gravii*), 0.2%; Creosote Bush, 0.2%; Boxthorn (*Lycium cooperi*), 0.2%. Perennials: Galleta Grass, 34.0%; Creosote Bush, 14.8%; Goldenhead (*Acamptopappus sphaerocephalus*), 11.4%; Anderson Thornbush (*Lycium andersonii*), 11.2%; Cheese Bush (*Hymenoclea salsola*), 6.2%; Burrobush (*Ambrosia dumosa*), 5.0%; White Ratany, 4.4%; Boxthorn, 2.4%; Bladder Sage (*Salazaria mexicana*), 1.8%; Pygmy Cedar (*Peucephyllum schottii*), 0.8%; Buckthorn Cholla (*Opuntia acanthocarpa*), 0.6%; Desert Mallow (*Sphaeralcea ambigua*), 1.4%; Catclaw Acacia, 1.0%; Gray Ball Sage (*Salvia dorrii*), 0.8%; Pinyon Wormwood (*Artemisia ludoviciana*), 0.8%; Nevada Joint Fir (*Ephedra nevadensis*), 0.6%; Indian Rice Grass (*Oryzopsis hymenoides*), 0.4%; Cooper Goldenbush (*Haplopappus cooperi*), 0.4%; Wild Almond (*Prunus andersonii*), 0.2%; Horsebrush (*Tetradymia canescens*), 0.2%; Yucca schidigera, 0.2%; Paper Flower (*Psilostrophe cooperi*), 0.2%; Narrow Scaled Felt-thorn (*Tetradymia stenolepis*), 0.1%. **Edge:** Surrounded on four sides by similar habitat. **Topography:** Flat, except in wash areas. **Elevation:** 3720 ft. Nearest mountains are Piute Mountains, 6 mi E. **Water:** Nearest water is a cattle trough and tank, about 200 ft NE of the plot. **Weather:** Temperatures about 53-100°F (average 85°). Winds were 5-25 knots, usually blowing steadily 10-15 knots during the day. **Coverage:** June 12, 14, 21, 23, 25-26, 28, 30; 0530-1100 and 1300-1800. Total hours: 52. **Census:** Mourning Dove, 4 (33, 13); Black-throated Sparrow, 3.5 (29, 12); Ash-throated Flycatcher, 2; Mockingbird, 2; Loggerhead Shrike, 2; Sage Sparrow, 2; Cactus Wren, 1.5; Black-tailed Gnatcatcher, 1.5; Am. Kestrel, 1; Say's Phoebe, 1; Verdin, 1; Bendire's Thrasher, 1; Brewer's Sparrow, 1.; Le Conte's Thrasher, 0.5. **Total:** 14 species; 24 territorial males (196/km², 79/100 acres). **Visitors:** Red-tailed Hawk, Cassin's Kingbird, Horned Lark, Scott's Oriole, House Finch. **Remarks:** This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *D. JOHNSTON and M.*

FOSTER, 99 S 12th St, San Jose, Calif 95112

158. ASPEN FOREST. — **Location:** Manitoba; Duck Mountain Provincial Forest, Shell River Valley, 0.4 km N of intersection of P.R. 367 and gravel road lying W of Shell River; 51°35'N, 101°14'W, Child's Lake (62 N/11) map sheet. **Continuity:** New. **Size:** 16 ha = 39.5 acres (square, surveyed). **Description of Plot:** The dominant canopy tree is Quaking Aspen (*Populus tremuloides*) with some Balsam Poplar (*P. balsamifera*). Most prominent in the understory is Beaked Hazel (*Corylus cornuta*). The ground cover is primarily Wild Sarsaparilla (*Aralia nudicaulis*), Snowberry (*Symphoricarpos albus*), Tall Lungwort (*Mertensia paniculata*), and Purple Oat Grass (*Schizachne purpurascens*). A quantitative survey of vegetation gave the following results: Trees 3-in. diameter and over, based on eight 0.01 ha square sample plots, 622/acre (1538/ha); total basal area 192.5 ft²/acre. Species comprising 90% of the total number of trees: Quaking Aspen 490, 79, 72, 88; Balsam Poplar 110, 18, 23, 75; White Spruce (*Picea glauca*) 15, 2, 5, 25. Trees by diameter size class: A (3-6 in.) 335, 54, 6.7, 17; B (6-9 in.) 180, 29, 10.8, 28; C (9-15 in.) 80, 13, 12, 31; D (15-21 in.) 25, 4, 9, 23. Shrub stems/acre 6.625; ground cover 56%; canopy cover 69%; average canopy height 57 ft (range 35-77). **Edge:** Bordered on all sides by similar forest; NE corner is 3 m from road ditch. Two small meadows are located at the SE and SW corners. **Topography:** Slope ascending from N to S and SE at 30-40° for 100-150 ft S and NE ends level. **Elevation:** 2000 ft. **Weather:** Mostly warm and clear. **Coverage:** June 2, 7, 11, 17-18, 23, 28-29; 0500-0830 hours. Total man-hours: 30. **Census:** Ovenbird, 26 (163, 66); Red-eyed Vireo, 19 (119, 48); Chestnut-sided Warbler, 12 (75, 30); Am. Redstart, 10 (63, 25); Canada Warbler, 6 (38, 15); Mourning Warbler, 4.5 (28, 11); Swainson's Thrush, 3 (19, 8); Black-and-white Warbler, 3; Black-throated Green Warbler, 3; Chipping Sparrow, 3; Connecticut Warbler, 2.5; White-throated Sparrow, 2; Black-capped Chickadee, 1; Ruffed Grouse, +; Hairy Woodpecker, +. **Total:** 15 species; 95 territorial males or females (594/km², 241/100 acres). **Visitors:** Blue Jay, White-breasted Nuthatch, Cedar Waxwing, Orange-crowned Warbler, Nashville Warbler, Yellow-rumped Warbler, Com. Yellowthroat, Brown-headed Cowbird, Rose-breasted Grosbeak, Pine Siskin. **Remarks:** Four nests were located: Swainson's Thrush, 1; Black-and-white Warbler, 1; Am. Redstart, 2. The Connecticut Warblers only occurred in the two forest-meadow edge habitats. One White-throated Sparrow territory was in the NW meadow while the other one occurred within the forest close by. Chipping Sparrows and Black-throated Green Warblers were heard or seen only in the White Spruce. Special thanks to Shelley McCready and Cathy Rewcastle for quantitative vegetation analysis data. — *LOUIS L'ARRIVEE (compiler) and DAN GUINAN, Dept. of Renewable Resources and Transportation Services, 1495 St. James Street, Winnipeg, Manitoba.*

159. ASPEN FOREST. — **Location:** Manitoba, Hecla Island, 1.2 km N and 2.8 km W of Hecla Village off Hwy. 233; 51°8.42'N, 96°42.2'W, Hecla, 62 P. **Continuity:** New. **Size:** 14 ha = 34.6 acres (400 m N-S by 350 m E-W, 50 m grid laid out with compass and measured rope). **Description of Plot:** The dominant canopy tree is Quaking Aspen (*Populus tremuloides*) with scattered Balsam Fir (*Abies balsamea*) and Paper Birch (*Betula papyrifera*). Balsam Poplar (*P. balsamifera*) is found in some of the wet, low-lying areas. Most prominent in the understory are Beaked Hazelnut (*Corylus cornuta*), Saskatoon Serviceberry (*Amelanchier alnifolia*) and Rose (*Rosa* spp.) Snowberry (*Symphoricarpos occidentalis*) occurs in part of the W side that contains very little canopy cover from the sparse, stunted aspen trees. The ground cover is largely dominated by grasses, mosses and N. Bedstraw (*Galium septentrionale*). Smaller amounts of Wild Strawberry (*Fragaria glauca*), Dewberry (*Rubus pubescens*) and Pink Pyrola (*Pyrola asarifolia*) are also present. A quantitative survey of the trees showed: Trees 3-in in diameter and over based on five 0.04 ha square samples, 460/acre; total basal area 98.3 ft²/acre. Species comprising 90% of the total number of trees: Quaking Aspen, 380, 83, 86, 82; Balsam Fir, 48, 10, 7, 35; Balsam Poplar, 14, 3, 4, 25; Paper Birch, 12, 3, 2, 10. Trees by diameter size class: A (3-6 in.) 328, 70, 38.7, 39; B (6-9 in.) 123, 27, 43.8, 45, C (9-12 in.) 12, 3, 11.5, 12; D (12-15 in.) 2, 0, 4, 3, 4. Shrub stems/acre 50,300; ground cover 81%; canopy cover 36%; average canopy height 38 ft (range 33-69). **Edge:** Bordered on all sides by similar habitat. A small lake lies 100 m to the N. **Topography:** Essentially flat. **Elevation:** About 720 ft. **Weather:** Surveys all were on relatively cool, overcast days with three exceptions. Winds reached force 3 (Beaufort) on 4 of 8 surveys. **Coverage:** June 3-4, 11-12, 17-18; July 1-2; 0430-0945 hours, CDT. Total man-hours: 27. **Census:** Mourning Warbler, 4 (29, 12); Ovenbird, 3.5 (25, 10); Chestnut-sided Warbler, 3 (21, 9); Red-eyed Vireo, 2.5; Tennessee Warbler, 2.5; Nashville Warbler, 2; White-throated Sparrow, 2; House Wren, 1; Yellow-bellied Sapsucker, +; Red-breasted Nuthatch, +. **Total:** 10 species, 20.5 territorial males (146/km², 59/100 acres). **Visitors:** E. Kingbird, Cedar Waxwing, Black-throated Green Warbler, Blackburnian Warbler, Bay-breasted Warbler, Purple Finch, Am. Goldfinch. **Remarks:** No nests were located but young Mourning Warblers and White-throated Sparrows were seen. This census was a result of a co-operative project between Manitoba Provincial Parks and Research Branches in 1977. Walter E. Klenner and Jean R. Hnytka constructed the plot and did the vegetation analysis. The census, undertaken in 1978, was sponsored by the Prairie Migratory Bird Research Centre of the Canadian Wildlife Service. — *CALVIN W. CUTHBERT, Dept. of Renewable Resources and Transportation Services, 1495 St. James St., Winnipeg, Manitoba, Canada R3H 0W9*

160. ASPEN FOREST. — **Location:** Manitoba; Morton Municipality; near Boissevain, 322 m E of Hwy. 446 on the N boundary of Turtle Mountain Provincial Park; Sect. 31, Rge 20, T 1; 49°05'N, 100°08'W, Deloraine 62 F/1. **Continuity:** New. **Size:** 16 ha = 39.5 acres (400 m N-S by 400 m E-W, 50 m grid laid out



with compass and measured rope) **Description of Plot:** The dominant canopy tree is Quaking Aspen (*Populus tremuloides*) with an abundance of Green Ash (*Fraxinus pennsylvanica*) scattered throughout. Mature Paper Birch (*Betula papyrifera*) and young Bur Oak (*Quercus macrocarpa*) occur sparsely in several areas. Balsam Poplar (*P. balsamifera*) and Willows (*Salix* sp.) occur in imperfectly drained areas. The prominent understory is Beaked Hazelnut (*Corylus cornuta*) with an abundance of Green Ash and Quaking Aspen regeneration. The ground cover is dominated by Wild Sarsaparilla (*Aralia nudicaulis*). The area contains several small sedge meadows all less than one inch in size. A quantitative survey of the vegetation gave the following results: Trees 3-in. in diameter and over, based on 10 circular samples, 488/acre; total basal area 132 ft²/acre. Species comprising 90% of the total number of trees: Quaking Aspen, 347, 71, 97, 73; Balsam Poplar, 43, 9, 11, 8; Green Ash, 36, 7, 8, 6; Bur Oak, 11, 2, 4, 3, Paper Birch, 15, 3, 9, 7; Willow, 9, 2, 1, 1; dead trees, 27, 6, 3, 2. Trees by diameter size class: A (3-6 in.) 238, 49, 21, 18; B (6-9 in.) 185, 38, 56, 42; C (9-15 in.) 64, 13, 51, 39; D (15-21 in.) 1, 0, 2, 1. Shrub stems/acre 56,350; ground cover 60%; canopy cover 77%; average canopy height 42 ft (range 35-49). **Edge:** Bordered on all sides by similar forest for at least 50 m. A small lake is situated about 50 m to the SE. **Topography:** Rolling. **Elevation:** 2200-2250 ft. **Weather, 1977:** Above normal precipitation. **Coverage:** May 27, 30; June 1, 14, 16, 21, 23; July 1; 0540-0915, CDT. Total man-hours: 23. **Census, 1977:** Red-eyed Vireo, 125 (78, 32); Ovenbird, 9 (56, 23); Least Flycatcher, 6.5 (41, 16); Am. Redstart, 6 (38, 15), Com. Yellowthroat, 5 (31, 13); Veery, 4.5 (28, 11); Great Crested Flycatcher, 2; N. Waterthrush, 2; Broad-winged Hawk, 1; Mourning Warbler, 1; Ruffed Grouse, +; House Wren, +; White-throated Sparrow, +. **Total:** 13 species; 49.5 territorial males or females (310/km², 125/100 acres). **Weather, 1978:** Majority of counts done under clear, warm conditions (12-16°C) with light winds (5-15 km). **Coverage:** May 27, 29; June 5, 10, 19, 23, 27; 0500-0935, CDT. Total man-hours: 20. **Census, 1978:** Red-eyed Vireo, 9 (56, 23); Least Flycatcher, 8 (50, 20); Ovenbird, 5.5 (34, 14), Com. Yellowthroat, 4 (25, 10); Veery, 2; Great Crested Flycatcher, 1.5; Mourning Warbler, 1.5; Am. Redstart, 1.5; Broad-winged Hawk, 1; Yellow-bellied Sapsucker, 1; Black-capped Chickadee, 1; N. Waterthrush, 1, House Wren, +. **Total:** 13 species; 37 territorial males or females (231/km², 94/100 acres). **Remarks:** Nests found during the 1978 breeding season included Mallard, 1; Yellow-bellied Sapsucker, 1; Red-eyed Vireo, 1 (parasitized by a cowbird). Breeding bird densities in 1978 were down noticeably for all species except Least Flycatchers. A severe forest tent caterpillar infestation, which destroyed most of the overstory canopy, may have accounted for this. The Least Flycatchers were concentrated in wet areas where *Salix* occurred and in places where understory was sparse. Common Yellowthroats and N. Waterthrushes preferred the sedge meadow edges. The 1977 census was part of a co-operative project between Manitoba Provincial Parks and Research Branches. The 1978 census was sponsored by the Prairie Migratory Bird Research Centre of the Canadian Wildlife

Service — KENNETH D. DESMET (compiler) and CHRIS E. SMITH, Dept. of Renewable Resources and Transportation Services, 1495 St. James St., Winnipeg, Canada. R3H 0W9.

161. ASPEN FOREST. — **Location:** Manitoba, Bissett, 3 mi W and 3.4 mi S of village, about 50 m E of the Caribou Lake Road; 51° 01' N, 95° 25' W, Bissett, 52 M/4. **Continuity:** New. **Size:** 15 ha = 37.07 acres (300 m N-S by 500 m E-W; 50 m grid laid out with compass and measured rope). **Description of Plot:** The dominant canopy trees are Quaking Aspen (*Populus tremuloides*), Jack Pine (*Pinus banksiana*) and Balsam Poplar (*P. balsamifera*). Most prominent in the understory are Beaked Hazelnut (*Corylus cornuta*) and Saskatoon Serviceberry (*Amelanchier alnifolia*) with lesser amounts of Quaking Aspen, Red Osier (*Cornus stolonifera*), Nannyberry (*Viburnum lentago*) and in wet places Speckled Alder (*Alnus rugosa*). Twigs and dead leaves mat the ground. The ground cover consists primarily of Dewberry (*Rubus pubescens*), Wild Sarsaparilla (*Aralia nudicaulis*) and Wild Strawberry (*Fragaria virginiana*). A quantitative survey of the trees showed: Trees 3-in. diameter and over, based on 22 circular samples, 515/acre; total basal area 247 ft²/acre. Species comprising 95% of the total number of trees: Quaking Aspen, 385, 75, 83, 100; Jack Pine, 77, 15, 9, 23; Balsam Poplar, 26, 5, 4, 27; White Birch, 11, 2, 2, 32; White Spruce, 6, 1, 3, 27. Trees by diameter size class: A (3-6 in.) 355, 69, 35.5, 32; B (6-9 in.) 102, 20, 30.5, 27; C (9-15 in.) 58, 11, 46, 2, 41. Shrub stems/acre: 8,454; ground cover 84%; canopy cover 67%; average canopy height, 48 ft (range 30-65). **Edge:** The NE corner lies within 30 m of mixed aspen-spruce and the SW edge lies 50 m from a wet area supporting alder and tamarack. **Topography:** Sloping gradually downhill from W to E. **Elevation:** About 950 ft. **Weather 1977:** June was exceptionally wet, with 134 mm of precipitation compared with an average of 77 mm. However, surveys completed were all on relatively clear warm days except for three overcast mornings. **Coverage:** May 25-26, 31; June 1, 6-7, 14, 19, 25, 29; 0440-1315 hours, CDT. Total man-hours: 28. **Census 1977:** Ovenbird, 12 (80, 32); Least Flycatcher, 11.5 (77, 31); Red-eyed Vireo, 9 (60, 24); Veery, 3.5 (23, 9); Philadelphia Vireo, 3.5; Mourning Warbler, 2.5; Chestnut-sided Warbler, 2; Rose-breasted Grosbeak, 2; Blackburnian Warbler, 1.5; White-throated Sparrow, 1.5; Ruffed Grouse, 1; E. Wood Pewee, 1; Canada Warbler, 1; Hermit Thrush, 0.5; Barred Owl, +; Downy Woodpecker, +; Nashville Warbler, +; Brown-headed Cowbird, +; Chipping Sparrow, +. **Total:** 19 species; 52.5 territorial males or females (350/km², 142/100 acres). **Weather 1978:** Mostly unsettled and very wet. With few exceptions early morning temperatures were quite cool (5-10°C). Accumulation of heavy rains hampered movement through low spots in SE section. **Coverage:** June 6-7, 13-16, 20-23. Total man-hours: 38. **Census 1978:** Ovenbird, 12 (80, 32); Least Flycatcher, 11 (73, 30); Red-eyed Vireo, 7 (47, 19); Veery, 3.5 (23, 9); Chestnut-sided Warbler, 3 (20, 8); Mourning Warbler, 3; White-throated Sparrow, 3; Alder Flycatcher, 2.5; Philadelphia Vireo, 1; Blackburnian Warbler, 1; Connecticut Warbler, 1; Rose-breasted Grosbeak, 1; E. Wood Pewee, +. **Total:** 13

species, 49 territorial males or females (327/km², 132/100 acres) **Remarks:** Breeding bird densities appeared to be slightly lower in 1978. In 1977 a forest tent caterpillar outbreak occurred in the region for the fourth consecutive year and by late May complete defoliation of the aspen had taken place. This may have affected the breeding densities of some canopy species. However, Ovenbirds and Least Flycatchers were still the most common breeding birds, being found throughout the plot. Two species present in 1978 not previously recorded were Alder Flycatchers and a Connecticut Warbler. A Ruffed Grouse brood was seen each year. A Barred Owl nest contained one owlet in 1977. The 1977 census was part of a co-operative project between Manitoba Provincial Parks and Research Branches. The 1978 census was sponsored by the Prairie Migratory Bird Research Centre of The Canadian Wildlife Service. — CALVIN W. CUTHBERT (compiler) and DOUG W. KYLE, Dept. of Renewable Resources and Transportation Service, 1495 St. James Street, Winnipeg, Canada. R3H 0W9.

162. BLACK SPRUCE FOREST. — **Location:** Manitoba; Duck Mountain Provincial Park, 1.25 km S of P.R. 367 at E end of Singush Lake; 51° 37' N, 100° 46' W, Singush Lake (62 N/10) map sheet. **Continuity:** New. **Size:** 16 ha = 39.5 acres (square, surveyed). **Description of Plot:** The dominant canopy tree is Black Spruce (*Picea mariana*) with some Jack Pine (*Pinus banksiana*) and Quaking Aspen (*Populus tremuloides*). There is no understory and the ground cover is primarily mosses, the commonest being *Pleurozium schreberi*. An intermittent stream runs through the plot. A quantitative survey of vegetation gave the following results: Trees, 3 in. diameter and over, based on eight 0.01 ha² sample plots, 1695/acre (4238/ha); total basal area 252.5 ft²/acre. Species comprising 90% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance (%) and frequency in that order). Black Spruce, 1475, 87, 75, 100; Quaking Aspen, 35, 2, 11, 25; Jack Pine, 185, 11, 12, 50. Trees by diameter size class (figures after each class give the number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance): A (3-6 in.) 1410, 83, 141, 56; B (6-9 in.) 240, 14, 70, 28; C (9-15 in.) 40, 2, 32, 13; D (15-21 in.) 5, 0, 9, 4. Shrub stems (primarily Black Spruce and Jack Pine <3 in dbh) 23, 125/acre; ground cover 61%; canopy cover 65%; average canopy height 40 ft (range 32-45). **Edge:** Surrounded on all sides by similar forest. The NW corner is 100 m from Singush Lake. **Topography:** Flat except for two small ridges. Average elevation 2250 ft. **Weather:** Overall warm and clear; 5 mornings were clear, 3 cloudy and wet. **Coverage:** May 30; June 4, 10, 13, 15, 20-21, 26; 0530-0750. Total man-hours: 24. **Census:** Yellow-rumped Warbler, 22 (138, 56); Golden-crowned Kinglet, 5 (31, 13); Chipping Sparrow, 4 (25, 10), Swainson's Thrush, 3 (19, 8); Ruby-crowned Kinglet, 1; Gray Jay, +; Black-capped Chickadee, +; Boreal Chickadee, +; Brown Creeper, +; Bay-breasted Warbler, +. **Total:** 10 species; 35 territorial males (219/km², 89/100 acres). **Visitors:** Goshawk, Great Horned Owl, Com. Raven, White-breasted Nuthatch, Cedar Waxwing, Magnolia Warbler, Blackburnian Warbler, Pine Grosbeak, Pine Siskin, Dark-

eyed Junco **Remarks:** Special thanks to Shelly McCready and Cathy Rewcastle for quantitative vegetation analysis data. — DAN GUINAN (compiler) and LOUIS L'ARRIVEE, Dept. of Renewable Resources and Transportation Services, 1495 St. James Street, Winnipeg, Man.

163. JACK PINE FOREST. — **Location:** Manitoba; Bissett, 52 mi SE of village and 50 m S of Hwy. 304 (Nopiming Parkway at Mile 4), 50°39'N, 95°25'W, Bissett, Flintstone Lake, 52 L/11. **Continuity:** New. **Size:** 16 ha = 39.5 acres (400 m N-S by 400 m E-W, 50 m grid laid out with compass and measured rope). **Description of Plot:** Jack Pine (*Pinus banksiana*) is the dominant canopy tree; no understory exists. Prominent shrubs include Green Alder (*Alnus crispa*), which occurs in many scattered clumps, as well as Saskatoon Serviceberry (*Amelanchier alnifolia*), Quaking Aspen (*Populus tremuloides*) and some Beaked Hazelnut (*Corylus cornuta*). Prominent plants in the ground cover include Twinflower (*Linnaea borealis*), Bunchberry (*Cornus canadensis*), Wild Strawberry (*Fragaria virginiana*) and Wild Lily-of-the Valley (*Maianthemum canadense*), all growing overtop a layer of moss and to a much lesser extent bare ground. A quantitative survey of the trees showed: Trees 3-in. in diameter and over, based on 23 circular samples, 855/acre; total basal area 341.1 ft²/acre. Species comprising 91% of the total number of trees: Jack Pine, 854, 91, 94, 100. Trees by diameter size classes: A (3-6 in.) 687, 73, 68.7, 47; B (6-9 in.) 250, 26, 75.1, 52; C (9-12 in.) 1, trace, 1, trace. Shrub (and trees less than 3 in. dbh), stems/acre 797; ground cover 94%; canopy cover 67%; average canopy height 39 ft (range 30-45). **Edge:** The SW corner lies within 60 m of a bog area around which a thick growth of Speckled Alder (*A. rugosa*) exists. A small, semi-open rock ridge borders a portion of the W boundary. **Topography:** A gradual slope downward from N to S. **Elevation:** About 1050 ft. **Weather:** See census 161. Four censuses clear; the rest overcast and damp. **Coverage:** May 29-30; June 4, 12, 16-17, 22, 26, 30; 0455-1540, CDT. Total man-hours: 20. **Census:** Ovenbird, 5.5 (34, 14); Chipping Sparrow, 4.5 (28, 11); Yellow-rumped Warbler, 3 (19, 8); Nashville Warbler, 2.5; Hermit Thrush, 1; Swainson's Thrush, 1; Yellow-bellied Flycatcher, 0.5; Com. Flicker, +; Solitary Vireo, +. **Total:** 9 species; 18 territorial males or females (113/km², 46/100 acres). **Visitors:** Gray Jay, Blackburnian Warbler, Bay-breasted Warbler. **Remarks:** Nest found: Common Flicker. The Swainson's Thrush and Solitary Vireo did not establish territories until the middle of June. — CALVIN W. CUTHBERT, Dept. of Renewable Resources and Transportation Services, 1495 St. James Street, Winnipeg, Canada R3H 0W9.

164. MIXED FOREST. — **Location:** Manitoba; Duck Mountain Provincial Park, 1 km W of P.R. 367 along trail to Trapper Lake; 51° 51'35"N, 100°57'W; Singush Lake (62 N/11) map sheet. **Continuity:** New. **Size:** 16 ha = 39.5 acres (square, surveyed). **Description of Plot:** The dominant canopy trees are Quaking Aspen (*Populus tremuloides*), Black Spruce (*Picea mariana*), Balsam Poplar (*Populus*

balsamifera) and White Spruce (*P. glauca*). The understory is primarily Speckled Alder (*Alnus rugosa*). Most prominent in the ground cover is Wild Sarsaparilla (*Aralia nudicaulis*), Tall Lungwort (*Mertensia paniculata*) and Wood's Rose (*Rosa woodsii*). A trail (suitable for vehicle travel when dry) runs through the plot. A quantitative survey of vegetation gave the following results: Trees, 3-in. diameter and over, based on eight 0.01 ha² sample plots, 700/acre (1750/ha); total basal area 601.5 ft²/acre. Species comprising 90% of the total number of trees: Quaking Aspen, 250, 36, 53, 62; Black Spruce, 270, 38, 21, 62; Balsam Poplar, 110, 16, 13, 50; White Spruce, 50, 7, 6, 12; Paper Birch (*Betula papyrifera*), 15, 2, 0, 12; Jack Pine (*Pinus banksiana*), 5, 1, 1, 12. Trees by diameter size class: A (3-6 in.) 95, 14, 8, 2; B (6-9 in.) 235, 33, 70, 12; C (9-15 in.) 195, 27, 152, 25; D (15-21 in.) 145, 21, 261, 43; E (21-27 in.) 35, 5, 108, 18. Shrub stems number 1360/acre; ground cover 70%; canopy cover 70%; average canopy height 62 ft (range 53-75). **Edge:** Bordered on three sides by similar forest. The NW corner grades to Black Spruce forest near Trapper Lake. **Topography:** Essentially flat; average elevation 2350 ft. **Weather:** Overall warm and clear with 5 clear and 5 cloudy mornings. **Coverage:** June 1, 5, 9, 12, 19, 21, 26-29; 0500-0830. Total man-hours: 33. **Census:** Ovenbird, 25 (156, 63); Red-eyed Vireo, 12.5 (78, 32); Chestnut-sided Warbler, 3 (19, 8); Mourning Warbler, 3; Chipping Sparrow, 3; Blackburnian Warbler, 2; Cedar Waxwing, 1; Solitary Vireo, 1; Nashville Warbler, 1; Black-throated Green Warbler, 1; Ruffed Grouse, +; Hairy Woodpecker, +; Gray Jay, +; Black-capped Chickadee, +; Red-breasted Nuthatch, +; Swainson's Thrush, +; Yellow-rumped Warbler, +; Blackpoll Warbler, +; Am. Redstart, +; Dark-eyed Junco, +. **Total:** 20 species; 52.5 territorial males (328/km², 133/100 acres). **Visitors:** Blue Jay, Com. Raven, White-breasted Nuthatch, Black-and-white Warbler, Tennessee Warbler, Cape May Warbler, N. Waterthrush, Canada Warbler, Rose-breasted Grosbeak, Evening Grosbeak, Pine Siskin, White-throated Sparrow. **Remarks:** One Black-capped Chickadee and one Hairy Woodpecker nest were found. A flock of approximately 20 Evening Grosbeaks were feeding young on June 12. One Ruffed Grouse was seen with 5 young; males were heard drumming from several locations. Thanks to Shelly McCready and Cathy Rewcastle for quantitative vegetation analysis data. — LOUIS L'ARRIVEE and DAN GUINAN (compiler), Dept. of Renewable Resources and Transportation Services, 1495 St. James Street, Winnipeg, Man.

165. SEMI-OPEN BLACK SPRUCE BOG. — **Location:** Manitoba, 37 mi SE of Bissett, about 650 m S of Hwy. 304 (Nopiming Parkway); 50°48'N, 95°19'W, Garner Lake 52 L/14. **Continuity:** New. **Size:** 36 ha = 88.96 acres (600 m N-S by 600 m E-W; 50 m grid laid out with compass and measured rope). **Description of Plot:** In the closed portion the dominant canopy tree is Black Spruce (*Picea mariana*) with no understory; Tamarack (*Larix laricina*) is also widely distributed. Small clumps of Dwarf Birch (*Betula glandulosa*) are present, notably in the NE and NW sections. Important low shrubs present on the

many hummocks include Leatherleaf (*Chamaedaphne calyculata*), Bog-Rosemary (*Andromeda glaucophylla*), and Labrador-Tea (*Ledum groenlandicum*). Major elements in the ground cover consist of mosses (*Sphagnum* spp.), sedges (*Carex* spp.), Buckbean (*Menyanthes trifoliata*), horsetails (*Equisetum* spp.) and grasses. The NE half consists essentially of an open bog mat with a few scattered, stunted Tamarack. This open bog grades into fairly dense Black Spruce throughout the SW portion. A quantitative survey of the trees showed: Trees 3-in. diameter and over based on 25 0.1-acre circular samples, 115/acre, total basal area, 11.5 ft²/acre. Species comprising 97% of the total number of trees: Black Spruce 42, 88, 88, 40; Tamarack 4, 9, 9, 8. Smaller trees greater than 6-ft in height but less than 3-in. diameter, based on 25 0.1-acre circular samples (stems/acre): Black Spruce 45, Tamarack 8, dead Black Spruce 8, dead Tamarack 1 (most averaged 7-10 ft tall). Shrubs, woody stems less than 6 ft tall (stems/acre): Black Spruce 38, Tamarack 13, Dwarf Birch 5. Ground Cover 100%; canopy cover (of Black Spruce) 3%; average canopy height 26 ft (range 25-35). **Edge:** The bog extends in all directions for at least 500 m with the exception of the NE boundary, where a mixed conifer-hardwood forest lies within 350 m of the edge. **Topography:** Essentially flat. **Elevation:** About 1050 ft. **Weather:** See Census 161; all surveys taken under normal conditions with winds exceeding force 3 (Beaufort) on only one occasion. **Coverage:** May 28; June 2, 3, 9, 11, 20-21, 24, 28; 0445-1320 hours, CDT. Total man-hours: 24. **Census:** Palm Warbler, 4 (11, 4); Savannah Sparrow, 2.5; Connecticut Warbler, 2; Lincoln's Sparrow, 2; Le Conte's Sparrow, 1; Hermit Thrush, 0.5; Nashville Warbler, 0.5; Spruce Grouse, +; Com. Snipe, +, Com. Yellowthroat, +. **Total:** 10 species; 12.5 territorial males or females (35/km², 14/100 acres). **Visitors:** Marsh Hawk, Am. Kestrel, Sandhill Crane, Yellow-bellied Flycatcher, Gray Jay, Boreal Chickadee, Cedar Waxwing. **Remarks:** A hen Spruce Grouse with one young capable of flight was seen and a male was observed on two occasions. Although two Connecticut Warblers held territories, three other birds were heard on territories outside of the plot throughout the census period. The Com. Yellowthroat was confined to an area of Dwarf Birch adjacent to the Black Spruce. — CALVIN W. CUTHBERT, Dept. of Renewable Resources and Transportation Services, 1495 St. James St., Winnipeg, Canada R3H 0W9.

166. LOWLAND LOW AND MEDIUM WILLOW THICKET. — **Location:** Alaska, upper Tanana River valley, Mile 3.5 Northway Road; 62°58'30"N, 141°50'20"W, Nabesna D-2 Quadrangle, USGS. **Continuity:** New (1977) **Size:** 4.25 ha = 10.50 acres (rectangular, surveyed, 117 × 362 m). **Description of Plot:** Clumps of 1-2 m tall shrubs interspersed with openings of wet-sedge meadow or dry dwarf shrub and herbaceous growth. Shrub growth was 29% Dwarf Birch (*Betula nana*); 28% Tall Blueberry Willow (*Salix novae-angliae*); 10% Silver Willow (*S. candida*); and 8% Low Blueberry Willow (*S. myrtillofolia*). Wet Sedge meadows consisted of primarily *Carex*, *Equisetum fluviatile*, and *Eriophorum vaginatum* Dwarf Shrub and herbaceous growth were mostly *Vaccinium uliginosum*, *Rubus arcticus*.



Census 166. Lowland Low and Medium Willow Thicket. Photo/M. A. Spindler.

cus. Parnassia palustris, and *Calamagrostis canadensis*. Canopy cover was <1%, and the tallest trees were scattered, stunted, White Spruce (*Picea glauca*) <3 m tall and 100-200 years old. (Quantitative information based on 34 sample plots. Plant names are from E. Hulten, *Flora of Alaska and Neighboring Territories*, 1968, except for *Salix*, which follows L. A. Viereck and E. L. Little, *Alaska Trees and Shrubs*, 1972.) **Topography:** Flat, underlain by continuous permafrost. **Elevation:** 522 m (1713 ft). **Edge:** Within typical river-flat mosaic vegetation, hence surrounded by different habitats — Tall Willow to the NW and wetlands to the SE. **Water:** Much of the plot was poorly drained and had standing water. A large creek (Moose Creek) flowed NE of the plot, and two large lakes were within 0.8 km (Tontethaimund L. to the NW and Fish Lake to the SE). **Weather:** Temperatures were cooler than normal (mean morning temperature: 43.5°F). Precipitation was 11% above normal during June, with a predominance of frontal rainstorms instead of the usual thunderstorms. Weather was clear on 3 censuses, partly cloudy on 2, foggy on 2, and drizzling on 1. (Temperature and precipitation data from Northway FAA Station.) **Coverage (1977):** June 4-5, 14-15, 25-26; July 5-6; 0500-0900. Total man-hours: 16. **Census:** White-crowned Sparrow, 4 (94, 38); Com. Snipe, 3.5; Lincoln's Sparrow, 3.5 (82, 33); Tree Sparrow, 2.5; Lesser Yellowlegs, 2; Savannah Sparrow, 1.5; Rusty Blackbird, 1; Am. Robin, 0.5; Yellow Warbler, 0.5; Mallard, +; Green-winged Teal, +; Com. Flicker, +; Alder Flycatcher, +; Swainson's Thrush, +; Orange-crowned Warbler, +. **Total:** 15 species; 19 territorial males or females (447/km², 181/100 acres). **Visitors:** Solitary Sandpiper, Hawk Owl, Cliff Swallow, Bohemian Waxwing, Gray-cheeked Thrush, Ruby-crowned Kinglet, Com. Redpoll, Pine Grosbeak, Fox Sparrow. **Remarks:** This habitat was the second-most productive habitat censused in the upper Tanana River valley study area. The

influence of wetlands on and adjacent to the plot, and the high seasonal primary productivity of lowland shrubs probably combined to produce a rich insect and invertebrate food supply, hence allowing a high breeding bird population. Species Diversity (H') was calculated at 2.132 (counting the "+" as 0.1). Nests found included: White-crowned Sparrow 2; Lesser Yellowlegs 1; Tree Sparrow 1. This work was funded by Northwest Alaskan Pipeline Company. We thank the Northway Natives for permission to locate plots on Village land, and Michele Mouton for assistance in the field. — MICHAEL A. SPINDLER and BRINA KESSEL. *Museum. Univ. of Alaska, Fairbanks, Alaska 99701.*



Census 167. Lowland Tall Alder-Willow Thicket. Photo/M. A. Spindler.

167 LOWLAND TALL ALDER WILLOW THICKET. — **Location:** Alaska, Upper Tanana River valley, Mile 3.5, Northway Road; 62° 58' 40" N, 141° 50' 30" W, Nabesna D-2 Quadrangle, USGS. **Continuity:** New (1977). **Size:** 3.37 ha = 8.32 acres (rectangular, surveyed, 93 × 362 m). **Description of Plot:** Extensive closed-canopy tall shrub stand 2.5-4.6 m in height. Typical riparian shrub habitat with 38% Thinleaf Alder (*Alnus incana*); 21% Diamondleaf Willow (*Salix planifolia*); 14% Little-tree Willow (*S. arbusculoides*); 14% Tall Blueberry Willow (*S. novae-angliae*); and 11% Feltleaf Willow (*S. alaxensis*). The shrub canopy averaged 3.7 m tall, while widely scattered Balsam Poplar (*Populus balsamifera*) and White Spruce (*Picea glauca*) were much taller (to 10 m). Canopy coverage was 23%. Understory was mostly Rose Hip (*Rosa acicularis*), Leatherleaf (*Chamaedaphne calyculata*), *Equisetum silvaticum*, *E. scirpoides*, Nagoonberry (*Rubus arcticus*), *Calamagrostis canadensis*, and *Carex* sp. Recent wildfire was probably not responsible for the shrubby character of the plot because trees and large diameter shrubs averaged 82 years old, and some were 180 years old. It is more likely that frequent flooding and the stunting influences of permafrost contributed toward maintaining the stand in a shrub stage. (Quantitative information based on 32 sample plots.) **Topography:** Flat, on the natural levee of Moose Creek. **Elevation:** 523 m (1715 ft). **Edge:** Surrounded by similar habitat on three sides, and bordering Low and Medium Willow Thicket on SE side. **Water:** Poorly drained with pools of standing water all summer. Moose Creek, a tributary of the Chisana River, flowed along the NW boundary and occasionally flooded the plot during periods of high water. Two large lakes were within 0.8 km of the plot (Tontethaimund L. to the NW and Fish L. to the SE). **Weather:** See Census 166. **Coverage (1977):** Censused concurrently with Census 166. Total man-hours: 16. **Census:** Yellow Warbler, 5.5 (163, 66); Alder Flycatcher, 3.5 (104, 42); Orange-crowned

Warbler, 2, Swainson's Thrush, 1.5, N Waterthrush, 1.5, Lincoln's Sparrow, 1.5, Lesser Yellowlegs, 1; Com. Flicker, 1; Rusty Blackbird, 1; White-crowned Sparrow, 1; Fox Sparrow, 1; Com. Snipe, 0.5; Am. Robin, 0.5; Tree Sparrow, 0.5; Mallard, +; Green-winged Teal, +; Gray Jay, +; Gray-cheeked Thrush, + **Total:** 18 species; 22 territorial males or females (653/km², 264/100 acres). **Visitors:** Solitary Sandpiper, Hawk Owl, Cliff Swallow, Boreal Chickadee, Ruby-crowned Kinglet, Bohemian Waxwing, Yellow-rumped Warbler, Pine Grosbeak, Com. Redpoll, Savannah Sparrow, Dark-eyed Junco. **Remarks:** This was the most productive habitat censused in the upper Tanana valley study area. The high densities may be attributed to three factors: the influence of wetlands; the high primary productivity of riparian shrub stands; and high spatial and vertical diversity afforded by a mature, and successional stable, tall shrub habitat. Species diversity (H') was calculated at 2.439 (counting "+" as 0.1). Nests found: Com. Flicker 1; Alder Flycatcher 1; Yellow Warbler 1. This work was funded by Northwest Alaskan Pipeline Company. We thank the Northway Natives for permission to locate plots on Village land, and Michele Mouton for assistance in the field. —MICHAEL A. SPINDLER and BRINA KESSEL, Museum, Univ. of Alaska, Fairbanks, Alaska 99701.

168. UPLAND ASPEN FOREST. — **Location:** Alaska, upper Tanana River valley, Mile 1274 Alaska Highway; 63°06'00"N, 141°59'30"W, Tanacross A-2 Quadrangle, USGS. **Continuity:** New (1977). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** A nearly pure Quaking Aspen (*Populus tremuloides*) stand with open understory. Tree composition was: 73% Aspen; 14% White Spruce (*Picea glauca*); 9% Willow (mostly *Salix bebbiana*, *F. glauca*, and *S. scouleriana*); 2% Balsam Poplar (*Populus balsamifera*). Ground cover was 47% low shrub, 33% forest litter, 12% herbs, and 6% grass. Major ground cover and understory species were *Linnaea borealis*, *Shepherdia canadensis*, *Epilobium angustifolium*, *Equisetum scirpoides*, *Arctostaphylos uva-ursi*, *Vaccinium vitis-idaea*, *Pyrola secunda*, *Calamagrostis canadensis*, *Mertensia paniculata*, *Geocaulon lividum*, *Rosa acicularis* and *Lupinus arcticus*. Five of the listed species produced fruits on which birds were observed to feed. Average height canopy was 12 m; thickness was 5.4 m. The tallest trees were 20 m high. Canopy coverage was 71%; density of trees was 1243 stems/ha; shrub density was 5694 stems/ha. The stand was approximately 100 years old; a severe and widespread forest fire in the late 1800s probably caused secondary succession to Aspen. (Quantitative information based on 98 sample plots.) **Topography:** Moderate slope (23%) on a generally S-facing (aspect = 199°) hillside. **Elevation:** 610-730 m (1950-2400 ft). **Edge:** Surrounded by similar habitat on all sides except the S, which bordered the Haines Petroleum Pipeline right-of-way. **Water:** Well-drained dry slope. The nearest open water was the Tanana River, 0.8 km to the S. **Weather:** See census 166. Clear on 4 censuses, clear and breezy on 1, and overcast with drizzle or scattered showers on 3. **Coverage (1977):** May 29-30; June 10-11, 21-22; July 2, 9; 0500-0900. Total man-hours: 32. **Census:** Am. Robin, 6.5 (65, 26); Yellow-rumped Warbler,

6 (60, 24), Orange-crowned Warbler, 5.5 (55, 22), Swainson's Thrush, 4.5 (45, 18), Dark-eyed Junco, 4 (40, 16); Gray Jay, 0.5; Ruffed Grouse, +; Com. Flicker, +; Hammond's Flycatcher, +; Black-capped Chickadee, +; Hermit Thrush, +; Bohemian Waxwing, +; Com. Redpoll, +. **Total:** 13 species; 27 territorial males or females (270/km², 109/100 acres). **Visitors:** Boreal Chickadee, Varied Thrush, Yellow Warbler, Townsend's Warbler, Wilson's Warbler, Pine Grosbeak. **Remarks:** This Aspen habitat was more productive than an adjacent pure birch forest habitat, however it was less diverse. Species Diversity (H') was calculated at 1.782 (counting "+" as 0.1), making it the least diverse forest habitat censused in the upper Tanana River valley. One Orange-crowned Warbler nest was found. Large flocks of Bohemian Waxwings (apparently non-breeders) fed on *Vaccinium vitis-idaea* and *Shepherdia canadensis* berries. Ground-feeding species such as Ruffed Grouse, Am. Robin, and Swainson's Thrush, were also observed utilizing the abundant berry crop. This work was funded by Northwest Alaskan Pipeline Company. We thank the Northway Natives for permission to locate plots on Village land and Michele Mouton for assistance in the field. —MICHAEL A. SPINDLER and BRINA KESSEL, Museum, Univ. of Alaska, Fairbanks, Alaska 99701.

169. UPLAND BIRCH FOREST. — **Location:** Alaska, upper Tanana River valley, Mile 1275 Alaska Highway; 63°06'15"N, 142°00'15"W, Tanacross A-3 Quadrangle, USGS. **Continuity:** New (1977). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** A forest dominated by Paper Birch (*Betula papyrifera*), with patches of open understory, or dense Mountain Alder (*Alnus crispa*) mid-story. Tree composition was: 54% Paper Birch, 25% Mountain Alder, and 17% Willow (mostly *Salix bebbiana*). Ground cover was 47% forest litter, 23% low shrub, 12% herbs, and 11% grass. Major ground cover and understory species were *Calamagrostis canadensis*, *Linnaea borealis*, *Mertensia paniculata*, *Rosa acicularis*, *Epilobium angustifolium*, *Equisetum scirpoides*, *E. pratense*, *Ribes* sp., *Viburnum edule*, and *Vaccinium vitis-idaea*. Average height of canopy was 10 m; thickness was 7.7 m. The tallest trees were 25 m high. Canopy coverage was 79%. Density of trees was 1158 stems/ha; shrub density was 7509 stems/ha. The stand was approximately 100 years old; a severe and widespread forest fire in the late 1800s probably caused secondary succession to birch. (Quantitative information based on 98 sample plots.) **Topography:** Moderate slope (23%) on a SW-facing (aspect = 242°) hillside. **Elevation:** 610-700 m (2000-2300 ft). **Edge:** Surrounded by similar habitat on all sides except the SW, which bordered the Haines Petroleum Pipeline right-of-way. **Water:** Well-drained, moist slope. The nearest open water was a small intermittent stream 0.4 km W of the plot, and the Tanana River, 1.6 km to the South. **Weather:** See Census 166. Clear on 4 censuses, partly cloudy on 1, overcast on 2, and drizzling on 1. **Coverage (1977):** June 2-3, 12-13, 23-24; July 3, 10; 0500-0900. Total man-hours: 32. **Census:** Swainson's Thrush, 5.5 (55, 22); Dark-eyed Junco, 5.5; Yellow-rumped Warbler, 5 (50, 20); Orange-crowned Warbler, 4.5 (45, 18); Gray Jay, 1; Black-capped Chick-

adee, 1, Varied Thrush, 1, Hermit Thrush, 1, Com. Redpoll, 1, Boreal Chickadee, 0.5, Am Robin, 0.5; Ruffed Grouse, +; Alder Flycatcher, +; Hammond's Flycatcher, +, Sharp-shinned Hawk, +. **Total:** 15 species, 26.5 territorial males or females (265/km², 107/100 acres). **Visitors:** Yellow-bellied Sapsucker, Rusty Blackbird, Pine Grosbeak. **Remarks:** This plot had lower density than an adjacent aspen forest, but a greater number of species. Species Diversity (H') was calculated at 2.104 (counting "+" as 0.1). Nests found: Black-capped Chickadee 1; Boreal Chickadee 1. Timing of the morning censuses on this hillside was critical because the duration of maximum singing activity was extremely short. The SW aspect of the plot caused it to be cool and dark well after sunrise, thus limiting singing activity. When the sun finally reached the plot, conditions suddenly became warm and bright causing singing to decline rapidly. This work was funded by Northwest Alaskan Pipeline Company. We thank the Northway Natives for permission to locate plots on Village land, and Michele Mouton for assistance in the field. —MICHAEL A. SPINDLER and BRINA KESSEL, Museum, Univ. of Alaska, Fairbanks, Alaska 99701.

170. UPLAND BIRCH - WHITE SPRUCE FOREST. — **Location:** Alaska, upper Tanana River valley, Mile 1265 Alaska Highway; 63°01'30"N, 141°48'00"W, Tanacross A-2 Quadrangle, USGS. **Continuity:** New (1077). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** A generally homogeneous mixture of Paper Birch (*Betula papyrifera*) and White Spruce (*Picea glauca*) on the upper (E) side, and evenly distributed patches of birch and White Spruce on the lower (W) side. Both sides had a codominance of Mountain Alder (*Alnus crispa*), typical of moist birch slopes. Tree composition was 45% birch, 30% White Spruce, 22% Mountain Alder, and 3% willow (mostly *Salix bebbiana*). Ground cover was 42% forest litter, 19% moss and lichen, 13% herbs, and 10% grass. Major ground cover and understory species were *Calamagrostis canadensis*, *Rosa acicularis*, *Equisetum pratense*, *E. scirpoides*, *Mertensia paniculata*, *Epilobium angustifolium*, *Ribes* sp., *Geocaulon lividum*, and *Linnaea borealis*. Average height of canopy was 10 m; thickness was 7.7 m. The tallest trees were 27 m high. Canopy coverage was 79%. Density of trees was 1443 stems/ha; shrub density was 7005 stems/ha. Two different forest fires influenced vegetation on the plot: One fire 105-130 years ago burned over the plot and entire surrounding area; a later fire 56-60 years ago burned about one third of the W side. Hence, there were two different age classes of trees. (Quantitative information based on 98 sample plots.) **Topography:** Gentle slope (17%) on a W-facing (aspect = 282°) hillside. **Elevation:** 580-640 m (1900-2100 ft). **Edge:** Surrounded by similar mixed birch-White Spruce forest on the SW and N, and by older White Spruce-birch forest on the E. **Water:** Well-drained, moist slope. The nearest open water was the Chisana River 0.8 km of the plot. **Weather:** See Census 166. Clear on 4 censuses, partly cloudy and breezy on 1, partly cloudy and calm on 2, and overcast on 1. **Coverage (1977):** June 6-7, 16-17, 27, 29; July 4, 11; 0500-0900. Total man-hours: 32. **Census:** Swainson's Thrush, 11 (110, 45); Yellow-rumped War-

bler, 6 5 (65, 26), Dark-eyed Junco, 6 (60, 24), Townsend's Warbler, 5 (50, 20), Varied Thrush, 2; Orange-crowned Warbler, 1.5; Gray Jay, 1; Brown Creeper, 1; Am. Robin, 1; Com. Redpoll, 1; Sharp-shinned Hawk, +; Ruffed Grouse, +; Boreal Chickadee, +; Ruby-crowned Kinglet, +. **Total:** 14 species; 36 territorial males or females (360/km², 146/100 acres). **Visitors:** Com. Flicker, Yellow-bellied Sapsucker, Bohemian Waxwing, Wilson's Warbler, Pine Grosbeak, White-winged Crossbill. **Remarks:** This mixed forest plot had the highest breeding density of all forest habitats sampled in the upper Tanana River valley. Species Diversity (H') was calculated at 1.990 (counting the "+" as 0.1), which was intermediate for the forest plots. Large flocks of Bohemian Waxwings, White-winged Crossbills, and Com. Redpolls, which were apparently non-breeders, foraged on tree seeds. Nests found included: Orange-crowned Warbler, Yellow-rumped Warbler, Dark-eyed Junco. This work was funded by Northwest Alaskan Pipeline Company. We thank the Northway Natives for permission to locate plots on Village land, and Michele Mouton for assistance in the field. — MICHAEL A. SPINDLER and BRINA KESSEL, *Museum, Univ. of Alaska, Fairbanks, Alas.* 99701.

171. UPLAND WHITE SPRUCE FOREST. — **Location:** Alaska, upper Tanana River valley, Mile 1299 Alaska Highway; 63° 18' 15" N, 142° 32' 00" W, Tanacross B-4 Quadrangle, USGS. **Continuity:** New (1977). **Size:** 10 ha = 24.7 acres (square, surveyed). **Description of Plot:** Characteristic upland taiga climax White Spruce (*Picea glauca*) forest with open understory. Scattered Mountain Alder (*Alnus crispa*) patches occurred as a shrub layer. Occasional, large, Black Spruce (*Picea mariana*) trees grew on the lower (S) side, and Quaking Aspen (*Populus tremuloides*) blended in on the NE corner. Tree composition was 74% White Spruce, 13% Mountain Alder, 7% aspen, and 6% Paper Birch (*Betula papyrifera*). Ground cover was 38% moss and lichen, 23% low shrub, 16% forest litter, 12% grass, and 11% herbs. Major understory and ground cover species were *Vaccinium vitis-idaea*, *Calamagrostis canaensis*, *Geocalum lividum*, *Linnaea borealis*, *Rosa acicularis*, *Equisetum scirpoides*, *E. pratense*, *Pyrola secunda*, *Lupinus arcticus*, *Mertensia paniculata*, *Arctostaphylos uva-ursi*, and *Epilobium angustifolium*. Average height of canopy was 15 m; thickness was 12 m. The tallest trees were 37 m high. Average diameter was 16 cm, with a maximum of 80 cm. The largest trees in the upper Tanana valley occurred in this habitat. Canopy coverage was 61%. Density of trees was 904 stems/ha; shrub density was 6299 stems/ha. Trees averaged 166 years old, with a maximum of 200 years. This White Spruce stand was an example of the typical, but limited, "climax" forest that occurs in taiga uplands only on southerly facing slopes in the absence of fire for 200 years or more. Minimal evidence of fire (only fossil charcoal) indicated that this stand had not burned for several centuries. (Quantitative information based on 98 sample plots.) **Topography:** Steep slope (30-60%), 610-800 m (2000-2625 ft). **Edge:** Surrounded by similar habitat on all sides. **Water:** An intermittent stream flowed along the SE corner. **Weather:** See Census 166. Clear on 4 censuses, partly cloudy on 1,

overcast on 1, and overcast with drizzle on 2. **Coverage** (1977) June 8-9, 19-20, 30, July 1, 7-8; 0500-0900. Total man-hours: 32. **Census:** Townsend's Warbler, 9.5 (95, 38); Swainson's Thrush, 7 (70, 28); Dark-eyed Junco, 3.5 (35, 14); Boreal Chickadee, 2; Brown Creeper, 1.5; Yellow-rumped Warbler, 1.5; Gray Jay, 1; Sharp-shinned Hawk, +; Am. Kestrel, +; Ruffed Grouse, +; Great Horned Owl, +; Hairy Woodpecker, +; N. Three-toed Woodpecker, +; Varied Thrush, +; Ruby-crowned Kinglet, +; Com. Redpoll, +. **Total:** 16 species; 26 territorial males or females (260/km², 105/100 acres). **Visitors:** Com. Flicker, Bohemian Waxwing, Pine Grosbeak, Pine Siskin, White-winged Crossbill. **Remarks:** This taiga climax forest had breeding densities similar to pure deciduous forests in the upper Tanana valley that were successional stages of a fire sere. Number of breeding species, however, was greater than the deciduous forests, and was exceeded only by shrub habitats in the lowlands. Species Diversity (H') was calculated at 1.808 (counting "+" as 0.1), which was intermediate among the forest habitats. An uneven species abundance distribution probably contributed to the low H' value. Very large flocks (100's) of White-winged Crossbills, and lesser numbers of Bohemian Waxwings, Pine Siskins and Com. Redpolls, which were apparently non-breeders, foraged near the treetops during the census period. One Dark-eyed Junco nest was found. This work was funded by Northwest Alaskan Pipeline Company. We thank the Tetlin Natives for allowing us to census birds on their reservation. Thanks also to Michele Mouton for assistance in the field. — MICHAEL A. SPINDLER and BRINA KESSEL, *Museum, Univ. of Alaska, Fairbanks, Alas.* 99701.

172. ARCTIC LOW FOOTHILLS TUNDRA. — **Location:** Alaska, North Slope Borough, 5 km ESE of Atkasook; 70° 27' N, 157° 19' W, Meade River Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 25 ha = 61.8 acres. **Description of Plot:** See AB 32:115-116 (1978). **Weather:** Average June temperature, 1.7°C (-1.6° departure from average); 50% snow-free date June 3; melt-off virtually complete by June 8. On June 7 a 100 m wide swath at the W end was inundated as the Meade River overflowed its banks during spring break-up. Water depths in some areas exceeded 0.5 m. **Coverage:** June 2-3, 7-9, 13-14, 18-20, 25-28; July 2-3, 6. Total man-hours: 93. **Census:** Lapland Longspur, 13.5 (54, 22); W. Sandpiper, 8 (32, 13); Semipalmated Sandpiper, 5 (20, 8); Red Phalarope, 5; Oldsquaw, 4 (16, 6); Dunlin, 2.5; King Eider, 2; Arctic Loon, 1.5; Willow Ptarmigan, 1.5; Black-bellied Plover, 1.5; Pectoral Sandpiper, 1.5 (nesting females); Savannah Sparrow, 1; Am. Golden Plover, +; Parasitic Jaeger, +; Glaucous Gull, +; Arctic Tern, +. **Total:** 16 species; 47 territorial males or females (188/km², 76/100 acres). **Visitors:** Pintail, Ruddy Turnstone, Long-billed Dowitcher, N. Phalarope, Yellow Wagtail. **Remarks:** See AB 29:1135 (1975) re calculation of Pectoral Sandpiper density. 1.5 male Pectoral Sandpipers defended territories through June. Thus the total species number and density do not change if calculations are based on Pectoral males instead of females. Breeding bird density and species number are lower this year than last by 34% and 11%,

respectively. Of the 18 species breeding here last year, 8 decreased in abundance, 4 increased, and 6 remained unchanged. The largest declines occurred in last year's most abundant species: Lapland Longspur (down 43% from 96/100 ha) and Semipalmated Sandpipers (down 50% from 40/100 ha). The distributions of these species' territories this year suggest that much of their decreases were due to the Meade River overflow, noted above, as their territories were largely absent in the flooded region even though they had used the area in 1977. Flooding occurred during the period of territory establishment, and its physical effects remained visible for at least 3 weeks thereafter. None of the increases in other species' densities was large enough to offset these decreases. As the local ground surface showed no indication that overflow normally reached the plot, we suggest that last year's densities may be more representative. Data from other arctic coastal plain sites illustrate, however, that large year-to-year variations in densities are to be expected even without such a conspicuous catastrophe. Nests located (number successfully hatched in parentheses): Arctic Loon 1 (1); Oldsquaw 1 (1); Willow Ptarmigan 1 (0); Am. Golden Plover 1 (0); Black-bellied Plover 1 (0); Pectoral Sandpiper 1 (1); Dunlin 2 (?); Semipalmated Sandpiper 6 (3); W. Sandpiper 2 (2); Red Phalarope 3 (3); Savannah Sparrow 1 (1); Lapland Longspur 12 (6). This work was funded by the DOE as part of a study of shorebird ecology. — J. P. MYERS, W. D. SHUFORD, S. JOHNSTON, and F. A. PITALKA, *Museum of Vertebrate Zoology, Univ. of Calif., Berkeley, Calif.* 94720.

173. 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; 4 consecutive years. **Size:** 33 ha = 81.5 acres. **Description of Plot:** See AB 29:1135-6 (1975). **Weather:** Average temperature 0.6°C (0° departure from normal). Average wind speed during June 12.3 mph. Weather data from NOAA, Barrow, Alaska, 3 km to W. Temperatures were slightly below average during the end of May and the first 3 days of June, but they rose to an unseasonable warm spell during the rest of the first week of June. Melt-off had been delayed until this time, but proceeded quickly thereafter: 50% snow free by June 5 and clear by June 12 compared to clearing dates of June 12, 14 and 9 in 1975, 1976, and 1977, respectively. **Coverage:** June 7-8, 12, 14, 16, 20-21, 29; July 4, 9. Total man-hours: 39. **Census:** Lapland Longspur, 12 (36, 15); Semipalmated Sandpiper, 11 (33, 13); Dunlin, 5 (15, 6); Am. Golden Plover, 2; Pectoral Sandpiper, 2 (nesting females); Baird's Sandpiper, 2; Red Phalarope, 2; Steller's Eider, +; White-rumped Sandpiper, +; Pomarine Jaeger, +; Snow Bunting, +. **Total:** 11 species; 36 territorial males or females (109/km², 44/100 acres). **Visitors:** Oldsquaw, Ruddy Turnstone, Snowy Owl, Savannah Sparrow. **Remarks:** See AB 29:1135 re calculation of Pectoral Sandpiper density 6 males defended territories on the plot. Totals calculated using number of Pectoral males instead of females would be: 11 species, 40 territorial males or females (121/km², 49/100 acres). The 1978 breeding season resembled

1977 (110 birds/km²) closely, and was considerably lower than either 1975 or 1976 (159/km², and 167/km², respectively). As in 1977, Pectoral Sandpipers and Red Phalaropes bred less commonly than in 1975 or 1976, although Pectorals showed an increase over 1977, when none nested on the plot. Semipalmated Sandpipers increased dramatically over previous densities, rising 50% above the previous 3-year mean. Pomarine Jaegers nested in low abundance with sporadic success due to low but discernable Brown Lemming density (estimated to range locally up to 5 lemmings/ha). Last year's influx of normally more southern dabbling ducks did not materialize again. Instead, both Steller's Eider and Oldsquaw bred widely even though in low abundance near the plot itself (see Census 174). Nests located (number successfully hatched in parentheses): Am. Golden Plover 1 (1); Pectoral Sandpiper 2 (1); Baird's Sandpiper 1 (1); Dunlin 5 (5); Semipalmated Sandpiper 12 (9); Red Phalarope 2 (2); Pomarine Jaeger 1 (0); Lapland Longspur 9 (8). This work was funded by DOE as part of a study of shorebird ecology. — *J. P. MYERS, B. J. McCAFFERY, and F. A. PITEKKA, Museum of Vertebrate Zool., Univ. of Calif., Berkeley, Calif. 94720.*

174. 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; 4 consecutive years. **Size:** 36 ha = 88.9 acres (square, surveyed and gridded). **Description of Plot:** See AB 29:1136 (1975). The plot was expanded this year by adding a 150 × 600 m strip along the N border. Habitat within the new area is indistinguishable from the old portion. **Weather:** See Census 173. **Coverage:** June 8, 12-13, 16, 20, 28; July 4, 9. Total man-hours: 45. **Census:** Red Phalarope, 11 (31, 12); Lapland Longspur, 10 (28, 11); Dunlin, 7 (19, 8); Semipalmated Sandpiper, 5 (14, 6); Steller's Eider, 2; Oldsquaw, 1; Am. Golden Plover, 1; Ruddy Turnstone, 1; Baird's Sandpiper, 1; Pomarine Jaeger, 1; Snow Bunting, + **Total:** 11 species; 40 territorial males or females (111/km², 45/100 acres). **Visitors:** Long-billed Dowitcher, White-rumped Sandpiper. **Remarks:** See AB 29:1135 (1975) re calculation of Pectoral Sandpiper density. While no females nested this year, 5.5 Pectoral males defended territories. Totals based on territorial male Pectorals instead of nesting females are: 12 spp; 46.5 territorial males or females (129/km², 52/100 acres). Breeding bird density rose compared to last year (110 birds/km² in 1977) toward levels observed in 1975 and 1976 (143 and 148 birds/km², respectively). The increase was largely a result of a 4-fold rise in Red Phalaropes above the 1977 figure (7/km²) to densities within the range observed during 1975 and 1976 (average = 39/km²). Only two species showed appreciable absolute declines in density: Dunlin, from 26 to 20/km², and Lapland Longspur, from 37 to 28/km². Both these changes carried these species back toward their 1975-76 levels. Changes in waterfowl and lemming predators paralleled those reported in Census 173. Nests located (number hatched successfully in parentheses): Oldsquaw 1 (0); Steller's Eider 1 (0); Am. Golden Plover 1 (1); Ruddy Turnstone 2 (2); Baird's Sandpiper 1 (0); Dunlin 5 (4); Semipalmated Sandpiper 4 (1); Red Phal-

arope 7 (4); Pomarine Jaeger 1 (0); Lapland Longspur 4 (1). This work was funded by DOE as part of a study of shorebird ecology. — *J. P. MYERS, W. D. SHUFORD, and F. A. PITEKKA, Museum of Vertebrate Zool., Univ. of Calif., Berkeley, Calif. 94720.*

175. WET COASTAL PLAIN TUNDRA III. — **Location:** Alaska; North Slope Borough, 3 km SSE of Naval Arctic Research Laboratory, Barrow; 71°18'N, 156°38'W; Barrow Quadrangle, USGS. **Continuity:** New. **Size:** 36 ha = 88.9 acres (square, surveyed and gridded). **Description of Plot:** Lies on an old beach ridge elevated 1-2 m above the surrounding lowland. Microtopography dominated by polygonized ground resulting from interactions between shallow permafrost, the seasonal freeze-thaw cycle, and other physiographic factors. Polygon diameters range up to 10 m and polygon top-to-trough vertical heights reach 80 cm, although most are 30-50 cm. Position on beach ridge and well-developed polygons ensure early and largely complete draining during melt-off. As a result, this plot is relatively upland compared to surrounding areas and to the preceding two census plots. Standing water remains, however, in a few of the deeper polygon troughs through June, and a network of thermokarst ponds extends peripherally into one edge. To quantify habitat available on the plot we followed a procedure developed for our other plots and described in AB 29:1135-36 (1975): Low-center polygons mixed with thaw ponds 4%; low polygons 7%; mesic slopes 5%; high-center polygons 84%. Average maximum vegetation height measured in 42 50 × 50 m units on the plot was 12.7 cm, with the maximum average in all plots being 15.0 cm. **Edge:** Bordered on N and E sides by low wetlands, on S by continuing beach ridge upland, and on W by a mesic slope leading to low wetlands. **Elevation:** Below 50 ft. **Weather:** See Census 173. Melt-off was more protracted than on our other two Barrow plots, with extensive bare sites exposed on polygon tops by June 3; 50% melt-off was not reached until June 7, and the 100% clear date was June 12. **Coverage:** June 9, 13, 16-19, 24-25; July 1, 8. Total man-hours: 51. Most censuses 0700-1200 hours, with some during afternoon. **Census:** Lapland Longspur, 15.5 (43, 17); Dunlin, 6 (17, 7); Baird's Sandpiper, 3 (8, 3); Am. Golden Plover, 2; Pectoral Sandpiper, 2 (nesting females); Snow Bunting, 2; Pintail, 1; Red Phalarope, 1; Pomarine Jaeger, 1; Semipalmated Sandpiper, +; Snowy Owl, +. **Total:** 11 species; 33.5 territorial males or females (93/km², 38/100 acres). **Visitors:** Ruddy Turnstone. **Remarks:** See AB 29:1135-6 re Pectoral Sandpiper calculations. 3.5 male Pectorals defended territories on the plot (10/km²); totals based on Pectoral male density instead of female are 35 territorial males or females (97/km², 39/100 acres). The census results reflect the relative upland character of this plot compared to the two preceding censuses: While only Lapland Longspurs are markedly more common on this plot, the species pool has a broad upland bias, with Am. Golden Plover, Baird's Sandpiper, and Dunlin dominating the shorebird community. Red Phalaropes scarcely used the plot, and only one species of waterfowl (Pintail) nested here. Semipalmated Sandpiper were virtually

absent, probably because their distribution around Barrow is linked to the proximity of water courses, none of which were closer than 500 m to this plot. The decreased densities of these species more than offset any increase in others. Thus total density was lower here. Nests located (number hatched successfully in parentheses): Pectoral Sandpiper 1 (0), Baird's Sandpiper 1 (1); Dunlin 5 (4); Lapland Longspur 10 (5). At least one Lapland Longspur male attracted two females, showing sequential polygyny. This work was funded by DOE as part of a study of shorebird ecology — *J. P. MYERS, B. J. McCAFFERY, and F. A. PITEKKA, Museum of Vertebrate Zool., Univ. of Calif., Berkeley, Calif. 94720.*

176. WET COASTAL TUNDRA I. — **Location:** Alaska; Cape Krusenstern, 55 km NW of Kotzebue; 67°7'11"N, 163°42'31"W, Noatak (A-4) Quadrangle, USGS. **Continuity:** Established 1977. **Size:** 29.75 ha = 73.5 acres. **Description of Plot:** See AB 32:118 (1978). **Weather:** Melt-off was unusually early, with snow cover less than 10% before May 24. Average June temperature (mean of daily maxima and minima) was 44.4°F. Temperature range 29-67°F. Total rainfall 1.57 in. **Coverage:** May 30; June 3, 8, 14, 19, 22, 29, July 3, 7, 13, 18; 0600-1700. Total man-hours 31. **Census:** Savannah Sparrow, 11.5 (39, 16); Lapland Longspur, 11.5; Semipalmated Sandpiper, 4.5 (15, 6); N. Phalarope, 4.5; Com Snipe, 3.5 (12, 5); W. Sandpiper, 3.5; Com Redpoll, 2.5; Willow Ptarmigan, 2; Oldsquaw, 1; Am. Golden Plover, 1; Long-billed Dowitcher, 0.5; Sandhill Crane, +; Black-bellied Plover, +. **Total:** 13 species; 46 territorial males or females (155/km², 63/100 acres). **Visitors:** Red-throated Loon, Green-winged Teal, Whimbrel, Pectoral Sandpiper, Dunlin, Long-tailed Jaeger. **Remarks:** The early melt-off permitted some species to nest very early (W Sandpiper, complete clutch May 25; Redpoll, complete clutch by May 25) but the bulk of nest dates was similar to 1977. As in 1977, Long-tailed Jaegers were present throughout the season but did not nest. Arctic Foxes were absent, and Red Foxes were seen less frequently than in 1977. We did not observe any microtines in either year. This work was supported by BLM and NOAA as part of the Outer Continental Shelf Environmental Assessment Program (OCSEAP).

A typographical error in the previous year's report of this census, AB 32:118 (1978), listed total territories as 153/km². The correct value is 133/km². — *PETER G. CONNORS, DOUGLAS WOODBY, CAROLYN S. CONNORS, Bodega Marine Laboratory, Univ. of Calif., Bodega Bay, Calif. 94923.*

177. SHRUBBY SWAMP AND SEDGE HUMMOCKS. — **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; 12 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 19:625-627 (1965). **Coverage:** Apr. 30; May 24; June 12-13. Total man-hours: 20.5. **Census:** Swamp Sparrow, 50 (618, 250); Red-winged Blackbird, 32 (395, 160); Yellow Warbler, 22 (272, 110); Virginia Rail, 14 (173, 70); Willow Flycatcher, 11 (136, 55); Long-billed Marsh Wren, 9 (111, 45); Cedar Waxwing, 8 (99, 40); Song Sparrow, 8,

Com. Yellowthroat, 7 (86, 35), Gray Catbird, 6 (74, 30); Am. Goldfinch, 6; Mallard, 4 (49, 20); Brown-headed Cowbird, 4; Wood Duck, 3 (37, 15); E. Kingbird, 3; Alder Flycatcher, 2; Canada Goose, 1; Black Duck × Mallard, 1; Com. Gallinule, 1; Tree Swallow, 1; Com. Flicker, 0.5; Blue-gray Gnatcatcher, 0.5; Chestnut-sided Warbler, 0.5; Veery, +. **Total:** 24 species; 194.5 territorial males (2.403/km², 973/100 acres). **Remarks:** The water-level was the highest ever, from 1.5-3.5 ft throughout, with only some interspersed sedge-hummocks above it. Basic vegetation-sedge, Button-bush (*Cephalanthus occidentalis*), Meadowsweet (*Spirea alba*), and willow (*Salix* sp.) - was only 2.5 ft high. A harsh winter killed most willow thickets above this height, and general leaf-out was very thin, reducing Yellow Warbler's (down from 30-22) habitat to the higher edges of lake, river, and encroaching Red Maple (*Acer rubrum*). The decline in Com. Yellowthroats from 16 to 7 is believed due to the high water's reduction of nesting and feeding habitat. Virginia Rails and Long-billed Marsh Wrens, Red-winged Blackbirds, Swamp Sparrows, seemed unaffected. Numbers on this high density plot are believed to be more accurate each year due to practice and increased use of experimental techniques. Swamp Sparrows were found counter-singing throughout the plot approximately 125 ft from each other. The rise from 42 in 1977 to 50 this year is based on using that footage-distance figure and extrapolating it throughout. Thanks to Jim Cavanaugh. — **ANDREW MAGEE**, 34 Hobson St., Springfield, Mass. 01109.

178. CAT-TAIL MARSH. — **Location:** New York; St. Lawrence Co., 2 mi NW of Canton, NE end of Upper and Lower Lakes Wildlife Mgt. Area; 0.1 mi SW of Rte 68; 44°37'N, 75°14'W, Canton 7.5' Quadrangle, USGS. **Continuity:** New. **Size:** 6.9 ha = 17 acres (surveyed on ice). **Description of Plot:** A freshwater marsh created by impoundment of Indian Creek, which flows between Grasse and Oswegatchie Rivers. About 50% is open water; the remainder is occupied by typical submerged floating and emergent plants, including *Spartanium*, *Potamogeton*, *Alisma sagittaria*, sedges, *Lemna*, *Pontederia cordata*, *Iris*, and *Juncus*. Broad-leaved Cat-tail (*Typha latifolia*) is dominant. Woody emergents include *Salix* and *Spirea* spp. A zone of alder (*Alnus* spp.) was not included in the census. **Edge:** Bounded on NW and SE by alders and open fields, on NE by dam; on SW by similar habitat. **Topography:** Flat; adjacent fields slope toward plot. **Elevation:** 300-310 ft. **Weather:** Warm and dry during period (50-85°F). **Coverage:** May 23-24, 27; July 11; 0740-1700, EST. Total man-hours: 5. **Census:** Red-winged Blackbird, 11 (160, 65); Long-billed Marsh Wren, 6 (87, 35); Com. Gallinule, 4.5 (65, 26); Blue-winged Teal, 4 (58, 24); Mallard, 1; Ring-necked Duck, 1; Swamp Sparrow, 1; Am. Bittern, 0.5; Canada Goose, 0.5; E. Kingbird, 0.5; Wood Duck, +. **Total:** 11 species; 30 territorial males (436/km², 176/100 acres). **Visitors:** Great Blue Heron, Black Duck, Am. Coot, Killdeer, Com. Snipe, Black Tern, Tree Swallow, Barn Swallow, Cliff Swallow. **Remarks:** Yellow Warbler, Com. Yellowthroat, Song Sparrow nest in edge. — **LEE H. HARPER**, **KENNETH L. CROWELL**, Dept.

of Biol., St. Lawrence Univ., Canton, N.Y. 13617.

179. INLAND FRESH WATER MARSH. — **Location:** Pennsylvania; Luzerne Co., Salem Township; 4.2 km NE of Beach Haven and 6 km SSW of Shickshinny, Pa., approximately 50 m E of U.S. Highway 11; 41°06'N, 76°08'W, Shickshinny Quadrangle, USGS. **Continuity:** New (1977). **Size:** 5.2 ha = 12.8 acres (rectangular, 125 × 414 m surveyed with staff compass and tape). **Description of Plot:** Inland fresh water marsh, varying in depth from 3-80 cm. The area is maintained by a levee covered with Smooth Sumac (*Rhus glabra*), Silky Dogwood (*Cornus amomum*), Blackberry (*Rubus allegheniensis*), and Speckled Alder (*Alnus rugosa*). There are three small patches of Com. Cat-tail (*Typha latifolia*) totaling about 300 m. Thirty-one m² quadrats were measured and the three most frequent plants encountered were Rice Cut-grass (*Leersia oryzoides*) (87.1%), Arrowhead (*Sagittaria latifolia*) (61.3%), and Jewelweed (*Impatiens biflora*) (58.1%). Four plants composed 93% of the total cover; Rice Cut-grass (49.3%), Arrow-head (16.7%), Goldenrod (*Solidago gigantea*) (15%), and Bur-reed (*Spartanium eurycarpum*) (12%). **Edge:** Bordered by agricultural fields on the E, ponds on the N and S, and a railroad and highway on the W. **Topography:** The marsh lies in a basin with levees surrounding the land; has slight eastward slope downward. **Elevation:** 158.5 m (520 ft). **Weather, 1977:** Observation days varied greatly from sunny to overcast to fog. Average temperature, 18°C (65°F), and little to no breeze, 0-3 kph. **Coverage:** May 2, 20; June 7, 22-23, 27-28; dawn to 0930 and two evening trips. Total man-hours: 10. **Census 1977:** Red-winged Blackbird, 14 (270, 109); Song Sparrow, 5 (97, 39); Willow Flycatcher, 3 (58, 23); Yellow Warbler, 3; Am. Robin, 2.5; Gray Catbird, 2; Com. Yellowthroat, 2; N. Oriole, 2; Swamp Sparrow, 2; Indigo Bunting, 0.5. **Total:** 10 species; 36 territorial males (695/km², 281/100 acres). **Weather, 1978:** Relatively cool, temperature 6-18°C; usually partly cloudy. **Coverage:** May 8, 11, 13, 23, 30; June 1, 6; dawn to 0840, and one evening trip. Total man-hours: 14. **Census 1978:** Red-winged Blackbird, 22 females (425, 172); Song Sparrow, 5 (97, 39); Yellow Warbler, 4 (77, 31); Willow Flycatcher, 3 (58, 23); Com. Yellowthroat, 3; Gray Catbird, 2; Am. Robin, 2; Cardinal, 2; Swamp Sparrow, 2; Indigo Bunting, 0.5; Mallard, +; Wood Duck, +; Com. Grackle, +; Am. Goldfinch, +. **Total:** 14 species; 45.5 territorial males or females (878/km², 355/100 acres). **Remarks:** Nests located: Red-winged Blackbird, 52 (22 active); Willow Flycatcher, 2; Gray Catbird, 2; Am. Robin, 2; Yellow Warbler, 2; Swamp Sparrow, 2; and Cardinal, 1. Special thanks to J. D. Montgomery for his assistance with the botanical work and D. A. Gross for helping with the census. — **ROBERT M. RUHE**, *Ichthyological Associates, Inc.*, R.D. 1, Berwick, Pa. 18603.

180. SEDGE-TAMARACK DUNE POND. — **Location:** Ontario; Haldimand-Norfolk Regional Municipality; Port Rowan, 5.7 mi W of Long Point Lighthouse; 42°33'N, 80°05'W; Little Creek Ridges, Department of Energy, Mines and Resources, Ottawa. **Continuity:** New. **Size:** 9.66 ha = 23.86 acres (following

contours of shoreline, laid out in 0.52 acre squares with compass and measured rope, long and narrow, 1050 × 110 yds). **Description of Plot:** Mapped on graph paper and areas of three communities calculated. Of the total 23.86 acres, 12.9 acres were open water with no emergent vegetation (depth 2-4 ft); 7.6 acres are water (0.5-3 ft) densely vegetated with clumps or tufts composed principally of Sedge (*Carex stricta*), Marsh Fern (*Thelypteris palustris*), and Blue-joint Grass (*Calamagrostis canadensis*). The third community type of 3.3 acres, forming the NW portion of the grid, is Tamarack (*Larix laricina*) wetland. The two vegetation types are treated here separately. Sedge pond border had no canopy cover. Understory was composed exclusively of Buttonbush (*Cephalanthus occidentalis*). Groundcover was analyzed using 8 armlength transects each of .01 acre. A total of 160 oracular tube sightings were taken and species of plant in each sighting noted. Dominant species (figures after each give relative dominance



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(%) and frequency of occurrence (%) in the 8 transects Sedge, 30, 100, Marsh Fern, 23, 100, Blue-joint Grass, 22, 100; Swamp Loosestrife (*Decodon verticillatus*), 6, 75; Smartweed (*Polygonum amphibium*), 3, 63; False Nettle (*Boehmeria cylindrica*), 2, 38; Bull-head Lily (*Nuphar variegatum*), 2, 63; Marsh Cinquefoil (*Potentilla palustris*), 2, 38; Goldenrod (*Solidago* sp.), 2, 38; Marsh Scullcap (*Scutellaria epilobifolia*), 2, 63; Bracken (*Pteridium aquilinum*), 2, 13; Com. Cattail (*Typha latifolia*), 1, 13; Com. Bladderwort (*Utricularia vulgaris*), 1, 38. Also present in transects: *Carex comosa*, Canada Blue Grass (*Poa compressa*), Fragrant Water Lily (*Nymphaea odorata*), and Swamp Milkweed (*Asclepias incarnata*). Shrub stems/acre: 790; ground cover, 69%; canopy cover, 0. Standing water was a major component in all transects. Tamarack Wetland: Major canopy trees are Tamarack and Red Maple (*Acer rubra*). A quantitative vegetation survey following the method prescribed by James and Shugart gave the following results: Trees 3 in. diameter and over, based on five 0.1 acre circular samples, 96/acre, total basal area 38.2 ft²/acre. Species comprising 95% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence): Tamarack, 52, 54, 35, 100; dead trees, 34, 36, 36, 80; Red Maple, 4, 4, 19, 40; White Ash (*Fraxinus americana*), 2, 2, 4, 20; and White Cedar (*Thuja occidentalis*), 2, 2, 2, 20. Also present were Silver Maple (*A. saccharinum*), and Red Oak (*Quercus rubra*). Trees by diameter size class, figures after each class give number of trees/acre, relative density (%), basal area in

ft²/acre, relative dominance (%) A (3-6 in.) 48, 50, 4.8, 13, B (6-9 in.) 22, 23, 6, 6, 17, C (9-12 in.) 20, 21, 16, 42; D (12-15 in.) 6, 6, 10.8, 28. Shrub stems/acre 280; ground cover 75%; canopy cover 34%; average height 38 ft (range 30-65). Standing water is an important component of the area. **Edge:** Bordered on N and S by rolling dunes of blue grass, milkweed grasslands. The E border is a continuation of Sedge, Blue-joint Grass as described for the grid pond edge. Tamarack-Sedge wetland forms the W boundary. **Topography:** The pond forms the basin between two large ridges of sand dunes running in an E-W direction and rising 20-30 ft above the pond level. **Elevation:** 575 ft. **Weather:** Temperatures generally warm (14-24°C) with winds light. Overcast 40%; no rain. **Coverage:** May 30; June 6, 9, 17-18, 30; July 5, 9; between 0600-1300 and 1830-2030, EST. Total man-hours: 58.5. **Census:** Red-winged Blackbird, 38 (394, 159); E. Kingbird, 3 (31, 13); Tree Swallow, 3; Com. Yellowthroat, 3; N. Oriole, 2; Com. Flicker, 1; Starling, 1; Yellow Warbler, 1; Song Sparrow, 1; Meadowlark, +; Chipping Sparrow, +. **Total:** 11 species; 53 territorial males or females (549/km², 222/100 acres). **Remarks:** 45 nests located: Red-winged Blackbird, 38; Tree Swallow, 2; N. Oriole, 2; kingbird, 1; Starling, 1; Yellow Warbler, 1. Red-winged Blackbirds deserved special consideration. It was felt that the number of territorial males was not a reliable indication of breeding individuals for two reasons: First, was the polygamous nature of male Red-winged Blackbirds; Second, was the difficulty due to a high concentration and marked overlap of male territories. Consequently, the number of nests located was used to represent the number of territorial males or females. Since the search for nests was extensive, this is considered a reasonable estimate. — RICK HURST (compiler), MARY DELAFIELD, JARMO JALAVA, CHRIS RISLEY, and JAMES TASKER, Long Point Bird Observatory, Port Rowan, Ont., N0E 1M0 Canada.

664 (1967), and 23 742-743 (1969) Influx of silt and nutrients continues to deteriorate marsh. Core samples taken on W edge of main marsh on July 13 show 8 in. of silt accumulation. A core of the N marsh showed 6 in. of silt. This rapid accumulation has occurred over a period of only 10 years. **Weather:** Temperature was average, rainfall was over twice the average, the highest on record for the period (10 in.) **Coverage:** June 18, 20, 24, 27; July 1-4, 7-8, 10; most between 0600 and 1000 although some in early evening Total man-hours: 57. **Census:** Main marsh- Red-winged Blackbird, 41 (824, 333); Long-billed Marsh Wren, 15 (301, 122); Virginia Rail, 6 (121, 49); Sora, 2; Swamp Sparrow, 2, Pied-billed Grebe, 1; Am. Coot, 1. North Marsh- Red-winged Blackbird, 28; Com. Grackle, 8; Long-billed Marsh Wren, 6. **Total** (both marshes): 8 species; 110 territorial males (1928/km², 780/100 acres). **Visitors:** Regular- (A) nesting on or near edge: Com. Yellowthroat, Yellow Warbler, Tree Swallow, Gray Catbird, (B) suspected of nesting in marsh Com. Gallinule, (C) others: Green Heron, Blue-winged Teal, Killdeer, Black Tern, Mourning Dove, E. Kingbird, Rough-winged Swallow, Barn Swallow, Am. Robin, Cedar Waxwing, Irregular — Am. Bittern, Mallard, Wood Duck, Ring-necked Pheasant, Com. Snipe, Belted Kingfisher, Com. Flicker, Willow Flycatcher, Purple Martin, Warbling Vireo, Brown-headed Cowbird, Cardinal, Am. Goldfinch. **Remarks:** Because the census was begun late, the Red-winged Blackbird count is based primarily on the first few days of observation. They appear to have declined after an extremely high population in 1972. Virginia Rails and Soras have also declined. Long-billed Marsh Wrens show an increase since 1972. The following nests were found Main marsh- Red-winged Blackbird, 20, Long-billed Marsh Wren, 5; Am. Coot, 1, Tree Swallow, 1. North marsh- Red-winged Blackbird, 14; Com. Grackle, 8. Censusing was accomplished by wading and canoeing. Only 2 muskrat platforms were present compared with 300 in the 1969 census. Black Terns have not been recorded as nesting in the marsh since 1967. Swallows feeding over the marsh were too numerous to count. Although the Yellow-headed Blackbird appeared to be making a comeback in 1972 none were seen in 1978. The Pied-billed Grebe has declined from 3 pairs in 1972 to 1 pair. The loss of Least Bitterns and Pied-billed Grebes may well be due to decreasing water quality during the past years reducing their food source populations. The heavy rainfall during the census period carried large amounts of silt through the storm sewers causing extremely high turbidity in the N marsh and the E half of the main marsh. — JOHN RILEY (compiler) and JOHN FAHERTY, 1242 Morrison Court #2, Madison, Wisc. 53703.

181. CAT-TAIL AND SEDGE MARSH. — **Location:** Wisconsin; Dane Co., S border of Madison, T6N, R9E, Sect. 5 (Fitchburg Township), Madison Quadrangle, USGS. **Continuity:** Established 1967; 4 intermittent years. **Size:** Main marsh (S of railroad berm)-12.47 ha = 30.8 acres total, from 1969 census. The area of emergent vegetation on the edge is approximately 5 ha = 12.3 acres, estimated in 1972 census. The remainder is open water, unsuitable for nesting. The actual values are subject to continual variation because of water level fluctuations and differential advancement/recession of emergent growth. North marsh (N of railroad berm, not included in 1967 census)-1.33 ha = 3.2 acres total. Emergent vegetation on edge is .73 ha = 1.8 acres. **Description of Plot:** See AFN 21:662-

BREEDING BIRD CENSUSES IN WEST-CENTRAL NORTH DAKOTA

Breeding bird censuses were conducted on two lakes and two wetlands located near Underwood; situated in the Couteau Slope, a physiographic region characterized by numerous lakes and wetlands. The study sites are located on property owned by the Coal Creek Power Plant, that currently uses lignite coal from nearby strip mines. Precipitation records for June 1978 show a total of 2.19 in. of rain in the study area (Bismarck Weather Modification Board). The temperature ranged from an average high of 81° to an average low of 55°F. — JAN KNODEL, Zoology Dept., N.D. State Univ., Fargo, N.D. 58102.

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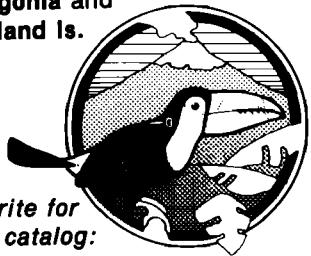
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182. FRESHWATER WETLAND I. —

Location: North Dakota, McLean Co., 4 mi S and 3½ mi W of Underwood, 47°24'N, 101°10'W, Underwood Quadrangle, USGS. **Continuity:** New. **Size:** 93.8 ha = 232 acres (irregular, measured by planimeter from county map). **Description of Plot:** A freshwater permanent (Class V) wetland. The dominant emergent marsh plants are Broad-leaved Cat-tail (*Typha latifolia*), *Phragmites communis*, and River Bulrush (*Scirpus fluviatilis*). The principal submergents are Com. Duckweed (*Lemna minor*), Com. Watermilfoil (*Myriophyllum exalbescens*), and Marsh Swampweed (*Polygonum coccineum*). The principal wet meadow plants are Prairie Cord-grass (*Spartina pectinata*), Sow Thistle (*Sonchus arvensis*), Foxtail (*Hordeum jubatum*), W Dock (*Rumex occidentalis*), Prairie Thistle (*Cirsium undulatum*), Hedge Nettle (*Stachys palustris*), Smooth Brome (*Bromus inermis*), Com. Ragweed, (*Ambrosia artemisiifolia*), Yellow Sweet Clover (*Melilotus officinalis*), White Sweet Clover (*M. alba*), and W. Wild Rose (*Rosa woodsii*). Approximately half of the wetland is covered by emergent vegetation, of which cat-tail is the most abundant. **Edge:** The NE and E sides are bordered by grazed pasture. Cattle were present during the census period. Wheat (*Triticum aestivum*) borders the NW and S edges, with fallow also bordering on the NW. Directly W, East Weller connects onto Census 183. Plains Cottonwood (*Populus sargentii*) and Peachleaf Willow (*Salix amygdaloides*) are found along the NW side. **Elevation:** 1900 ft. **Coverage:** June 5, 7, 9, 12, 22, 27; 0600-1100, CDT. Total man-hours: 12. **Census:** Yellow-headed Blackbird, 175 (186, 75); Red-winged Blackbird, 56 (60, 24); Am Coot, 29 (31, 13); Eared Grebe, 28 (30, 12), Gadwall, 20 (21, 9); Black Tern, 18 (19, 8), Blue-winged Teal, 11 (12, 5); Ruddy Duck, 11, Redhead, 4 (4, 2); N. Shoveler, 2; Com. Yellowthroat, 2; Pied-billed Grebe, 1; Am. Bittern, 1; Am. Wigeon, 1; Lesser Scaup, 1; Virginia Rail, 1; Marbled Godwit, 1; E. Kingbird, 1; Long-billed Marsh Wren, 1; Song Sparrow, 1; Mallard, 0.5. **Total:** 21 species; 365 territorial and non-territorial males (389 /km², 158/100 acres). **Visitors:** Great Blue Heron, Pintail, Spotted Sandpiper, Willet,


Ring-billed Gull, Am Robin, W Meadowlark, Com. Grackle, Brown-headed Cowbird. **Remarks:** Nests found: Yellow-headed Blackbird, 7; Am. Coot, 3; Black Tern, 1; 1 Mallard brood. A canoe was used three times to aid in coverage. This wetland was populated with a high density of dabbling ducks.

183. FRESHWATER WETLAND II. —

Location: North Dakota; McLean Co., 4 mi S and 4½ mi W of Underwood, 47°24'N, 101°12'W, Underwood Quadrangle, USGS. **Continuity:** New. **Size:** 246.9 ha = 610 acres (irregular, measured by planimeter from county map). **Description of Plot:** A freshwater permanent (Class V) wetland. The vegetation is identical to Census 182 however, the emergent vegetation is restricted to approximately 20% of the wetland. Broad-leaved Cat-tail and *Phragmites communis* comprised most of the emergent vegetation. **Edge:** The SW edge is bordered by grazed pasture. Cattle were present during the census period. Cropland consisting of wheat borders the NE and SE. A wheat and fallow field occur on the NW. Directly S is hayland. The wetland connects onto East Weller (Freshwater Wetland I) directly E. Plains Cottonwoods are found on the W side. **Elevation:** 1900 ft. **Coverage:** June 5-7, 9, 12, 14, 22, 28; 0600-0900, CDT. Total man-hours: 16. **Census:** Yellow-headed Blackbird, 12 (5, 2); Blue-winged Teal, 6 (2, 1); Mallard, 4 (2, 0.7); Killdeer, 4; Red-winged Blackbird, 4; Lesser Scaup, 3 (1, 0.5); Pintail, 2 (0.8, 0.3); Gadwall, 2; Am. Coot, 2; Long-billed Marsh Wren, 2; Com. Yellowthroat, 2; Song Sparrow, 2; Great Horned Owl, 1 (0.4, 0.2); N. Shoveler, 0.9; Redhead, 0.9; Green-winged Teal, 0.8; Wilson's Phalarope, 0.6. **Total:** 17 species; 49 territorial and non-territorial males (20/km², 8/100 acres). Owing to the large census area, complete coverage was difficult, resulting in a low density. **Visitors:** Ruddy Duck, Marbled Godwit, Upland Sandpiper, Willet, Com. Tern, Mourning Dove, Com. Flicker, E. Kingbird, Barn Swallow, W. Meadowlark, Brown-headed Cowbird. **Remarks:** Nests found: Blue-winged Teal, 2; Gadwall, 1. No waterfowl broods were sighted.

184. FRESHWATER LAKE I. —

Location: North Dakota, McLean Co., Samuelson Lake, 4 mi S and 2 mi W of Underwood, 47°23'N, 101°08'W, Underwood Quadrangle, USGS. **Continuity:** New. **Size:** 134.4 ha = 332 acres (irregular, measured by planimeter from county map). **Description of Plot:** An inland freshwater lake. The dominant emergent plants are Broad-leaved Cat-tail, and *Phragmites*. The principal submergents are Com. Duckweed and Marsh Smartweed (*Polygonum coccineum*). The principal wet meadow plants are Foxtail, Sow Thistle, W. Dock, Prairie Thistle, Hedge Nettle, Smooth Brome, Com. Ragweed, Black-eyed Susan (*Rudbeckia serotina*), Yellow Sweet Clover, White Sweet Clover, Alfalfa (*Medicago sativa*), Milkweed (*Asclepias syriaca*), Mock Cucumber (*Echinocystis lobata*), and Millet (*Setaria italica*). Emergent vegetation is restricted to approximately 15% of the lake. Cat-tails comprised approximately 85% of the emergent cover. The soft bottom drops off steeply. **Edge:** The wetland is bordered by wheat on the NW and SE edges. A hayfield lies directly S, with the Coal Creek Power Plant on the SW margin. Disturbed ground and a fallow field occur on the NE. In addition, Plains Cottonwood, Peachleaf Willow, and Lombardy Poplar (*Populus nigra*) surround the entire lake. **Elevation:** 1900 ft. **Coverage:** June 5-6, 8, 13, 15, 21, 23, 27; 0600-0900, CDT. Total man-hours: 16. **Census:** scaup sp., 54 (40, 16); Eared Grebe, 23 (17, 7); Yellow-headed Blackbird, 12 (9, 4), Red-winged Blackbird, 6 (4, 2); Redhead, 5 (4, 2); Ruddy Duck, 3 (2, 1); Am. Coot, 3; Gadwall, 2; Killdeer, 2; Song Sparrow, 2; Mallard, 1; Am. Wigeon, 1; Blue-winged Teal, 1, Mourning Dove, 1; Warbling Vireo, 1; Com Yellowthroat, 1; Clay-colored Sparrow, 1, Wilson's Phalarope, +. **Total:** 18 species; 119 territorial and non-territorial males (89/km², 36/100 acres). **Visitors:** Black-crowned Night Heron, Canada Goose, Wood Duck, Gray Partridge, Willet, Ring-billed Gull, Black Tern, E. Kingbird, Barn Swallow, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** 1 Canada Goose, 2 Gadwall and 2 Mallard broods were sighted. This lake was populated with a high density of diving ducks.



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4. Tropical Ecology—July 25–Aug 8, Dr. Joseph Copeland, Mr. John Moyle
5. Nature Photography—Aug 8–22, Mr. Herman Kitchen, Dr. Paul Sher

185. FRESHWATER LAKE II. — **Location:** North Dakota; McLean Co., Coal Lake, 4 mi S and 1 mi W of Underwood, 47°27'N, 101°05'W, Washburn NE Quadrangle, USGS. **Continuity:** New. **Size:** 49 ha = 121 acres (irregular, measured by planimeter from county map). **Description of Plot:** An inland freshwater lake. The dominant emergent plants are Broad-leaved Cat-tail, Com. Bulrush (*Scirpus validus*), River Bulrush (*S. fluviatilis*), and *Phragmites*. The principal submergents are Com. Duckweed, and Com. Watermilfoil (*Myriophyllum exalbescens*). The principal wet meadow plants are Foxtail (*Hordeum jubatum*), Sow Thistle (*Sonchus arvensis*), W. Dock, Com. Spikerush (*Eleocharis palustris*), Prairie Cordgrass,

Prairie Thistle, Hedge Nettle, Smooth Brome, and Millet. The lake is completely open, except for one stand of River Bulrush. The stony bottom drops off steeply. **Edge:** All sides are bordered by grazed pasture. Cattle were not present during the census period. Two stands of Juneberry (*Amelanchier alnifolia*) are on NW edge. **Elevation:** 2000 ft. **Coverage:** June 5-6, 8, 13, 21, 23, 27; 0600-1100, CDT. Total man-hours: 14. **Census:** Red-winged Blackbird, 6 (12, 5); Lesser Scaup, 4 (8, 3); Yellow-headed Blackbird, 4; Mallard, 2; Blue-winged Teal, 2; Black Tern, 2; Clay-colored Sparrow, 2; Chestnut-collared Longspur, 2; Gadwall, 1; Am. Wigeon, 1; Ruddy Duck, 1; Killdeer, 1; Upland Sandpiper, 1; Willet, 1. **Total:** 14 species; 30 territorial and non-territorial

males (61/km², 25/100 acres). **Visitors:** W. Grebe, Eared Grebe, Double-crested Cormorant, Great Blue Heron, Canada Goose, N. Shoveler, Redhead, Marbled Godwit, Ring-billed Gull, Mourning Dove, W. Meadowlark, Com. Grackle. **Remarks:** Nest found: Gadwall, 1. The following waterfowl broods were sighted: 1 Mallard; 1 Blue-winged Teal.

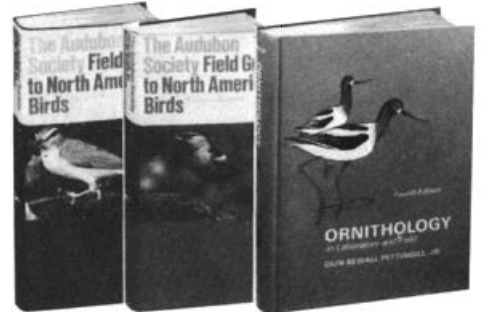
186. BULRUSH AND CAT-TAIL MARSH IN CONIFER FOREST. — **Location:** Montana; Lake Co., on W side of Flathead Lake, 6 mi N of Polson, on Kings Point Rd.; 47°35'N, 114°09'W, Wild Horse Island Quadrangle, USGS. **Continuity:** Established 1975; 4 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 31:84-85

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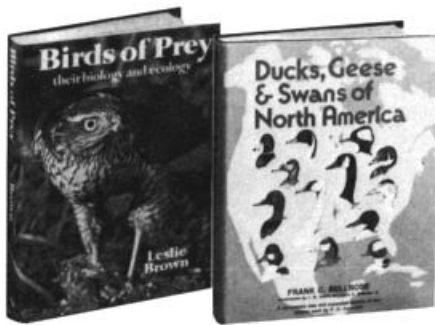
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(1976). **Weather:** All trips were on clear days with moderate breeze except one which had intermittent showers. **Coverage:** Apr. 13, 20; May 11, 25; June 8, 16, 28; July 8; 1800-2100 and dawn-1000. Total man-hours: 41. **Census:** Song Sparrow, 16 (40, 16); Yellow-headed Blackbird, 12 (30, 12); Com. Yellowthroat, 9 (22-9); Red-winged Blackbird, 9; Redhead, 6 (15, 6); Tree Swallow, 6; Canada Goose, 5 (12, 5); Mallard, 5; Am. Coot, 5; Willow Flycatcher, 5; Black-capped Chickadee, 5; Long-billed Marsh Wren, 5; Swainson's Thrush, 5; Mourning Dove, 4 (10, 4); Am. Robin, 4; Yellow Warbler, 4; Chipping Sparrow, 4; Wood Duck, 3 (7, 3); Ring-necked Duck, 3; W. Wood Pewee, 3; Barn Swallow, 3; Violet-green Swallow, 3; Cedar Waxwing, 3; Cassin's

Finch, 3; Pied-billed Grebe, 2; Cinnamon Teal, 2; Osprey, 2; Ruffed Grouse, 2; Calliope Hummingbird, 2; W. Flycatcher, 2; Mountain Chickadee, 2; Red-breasted Nuthatch, 2; Ruby-crowned Kinglet, 2; Yellow-rumped Warbler, 2; MacGillivray's Warbler, 2; Am. Redstart, 2; Dark-eyed Junco, 2; Prairie Falcon, 1; Rufous Hummingbird, 1; Com. Flicker, 1; Olive-sided Flycatcher, 1; Dusky Flycatcher, 1; Com. Raven, 1; Townsend's Solitaire, 1; Warbling Vireo, 1; Orange-crowned Warbler, 1; Great Blue Heron, +; Sharp-shinned Hawk, +; Red-tailed Hawk, +; Pileated Woodpecker, +; Solitary Vireo, +. **Total:** 51 species; 165 territorial males or females (408/km², 165/100 acres). **Remarks:** 17 nests found: Canada Goose, 3; Mallard, 1;

Osprey, 2; Prairie Falcon, 1; Am. Coot, 2; Com. Flicker, 1; Tree Swallow, 4; Black-capped Chickadee, 1; Am. Robin, 1; Song Sparrow, 1. Additional fledglings seen: Pied-billed Grebe, 3; Canada Goose, 8; Mallard, 2; Wood Duck, 12; Ruffed Grouse, 5; Am. Coot, 4; Black-capped Chickadee, 5; Am. Robin, 2; Cedar Waxwing, 6; Song Sparrow, 1. Bulrush and Cat-tail growth in 1977 was retarded by extremely dry weather. Heavy winter snows crushed these emergents further and reduced the old growth as early spring cover. Bulrush mats that normally provide nest platforms for a variety of water birds were almost non-existent in the 1978 season. This appears to account for the greatly reduced numbers of water birds and shore line insectivores present



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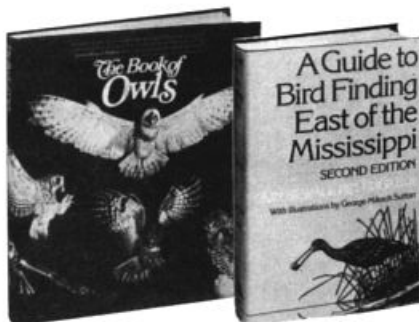
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187. FLOODPLAIN POND. — **Location:** Colorado, Weld Co., about 6 mi S and 1.5 mi E of Johnstown. Parts of Secs. 34 & 35, T4N, R67W, 40°15'N, 104°52'W; Milliken Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AB 28:1034-1035 (1974). **Weather:** Mostly clear, dry and warm throughout period. **Coverage:** May 14, 23, 30; June 6, 13, 20, 27; sunrise-0700. Total man-hours: 3.5. **Census:** Yellow-headed Blackbird, 9 (106, 43); Com. Yellowthroat, 3 (35, 14); Killdeer, 1; Long-billed Marsh Wren, 1. **Total:** 4 species; 14 territorial males (165/km², 67/100 acres). **Remarks:** There has been a 48% decline in numbers of breeding birds. The dominant Yellow-headed Blackbirds have declined for a second season. No birds are replacing them. Common Yellowthroats have declined slightly again. Long-billed Marsh Wren and Killdeer are new nesting species. There have been no visible major environmental changes. The plot, established to evaluate the effects of the St. Vrain Nuclear Generating Station on the surrounding environment, acts as an intermediate holding location for blowdown water from the cooling towers of the plant, which has been operational periodically at reduced capacity in 1978. — LADISLAV R. HANKA, Dept. of Zool. and Ent., Colorado State Univ., Fort Collins, Colo., 80523.

188. HAY-CROPPED MEADOW. — **Location:** Massachusetts; Plymouth Co., Town of Duxbury land, 2 mi SW of South Duxbury Center; 42°00'N, 70°43'W, Duxbury Quadrangle, USGS. **Continuity:** New. **Size:** 9.53 ha = 23.55 acres (a nearly regular area of this habitat within a rectangle with sides running NE-SW and NW-SE, surveyed). **Description of Plot:** Within what is probably the

oldest continuously farmed field in the United States, having been established in 1628 or 1630. In recent years the plot has been a meadow. Circa 2/5 of the plot was mown on June 21 to a height of 5 cm. There were neither tree nor shrub layers present. A survey of 7 random 1 m squares showed 9 species of grasses, sedges and rushes as the dominant group in the herb layer with 97% mean cover, an average 182 flowering spikes /1 m² (range 121-288) and mean height 51 cm (range 25-94). In order of decreasing density, the 5 commonest dicotyledons present were Red Clover (*Trifolium pratense*), Alsike Clover (*T. hybridum*), Tufted Vetch (*Vicia cracca*), Lesser Stitchwort (*Stellaria graminea*) and Ragweed (*Ambrosia elatior*); average herb layer cover was 100%. **Edge:** Surrounded by similar vegetation, except at the junction with an area of 11-year second growth (see Census No. 64). **Topography:** Essentially flat. **Elevation:** 15 ft. **Weather 1977:** Fairly clear days without precipitation; light SW-NW winds; temperature range 59°-79°F. **Coverage 1977:** June 17, 21, 25, 28; July 1, 6-7, 11, 16, 20; Aug. 11; 0515-0750, EDST. Total man-hours: 20. **Census 1977:** Bobolink, 20 (males) (210, 85); E. Meadowlark, 2; Song Sparrow, 1.5; Bobwhite, 1; Red-winged Blackbird, 1; Am. Kestrel, 0.5; Upland Sandpiper, 0.5; Am. Robin, 0.5. **Total:** 8 species; 27 territorial males (283/km², 115/100 acres). **Visitors:** Mourning Dove, Chimney Swift, Tree Swallow, Am. Goldfinch. **Remarks:** The figure for Bobolink represents a pre-mowing estimate of territorial males only. The census was of particular local interest, owing to the continuing decline of this meadow habitat throughout New England. **Weather 1978:** Fairly clear days without precipitation; winds light and variable; temperature range -58°-80°F. **Coverage 1978:** May 30; June 1, 5, 7, 13, 16, 19-20, 24-25, 29; July 1, 6; 0545-0930, EDST. Total man-hours: 27. **Census 1978:** Bobolink, 11 males (115, 47); E. Meadowlark, 2.5; Red-winged Blackbird, 1; Sharp-tailed Sparrow, 1. **Total:** 4 species; 15.5 territorial

males (163/km², 66/100 acres) **Visitors:** Bobwhite, Mourning Dove, Chimney Swift, Barn Swallow, Starling. **Remarks:** The 1977 total of 20 male Bobolinks dropped to 11 males. The latter figure was supported by a mean of 10.6 males seen per visit and 4 nests found; there were no obvious signs of polygamy. The Sharp-tailed Sparrow nest in a moist (fresh water) part of the meadow represents an unusual habitat for the species in Massachusetts where they normally breed in salt marsh vegetation. The work both years was carried out with the assistance of the intern staff of Manomet Bird Observatory. Grateful thanks to them, and to the Plymouth Five Cents Savings Bank for a generous grant, which completely supported the work. I am further indebted to the Town of Duxbury Selectmen for their enlightened cooperation — TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Manomet, Mass. 02345

189. OLD FIELD. — **Location:** Pennsylvania; Schuylkill Co., 1 mi SW of Weishample; 40°41'N, 76°27'W, Tremont Quadrangle, USGS. **Continuity:** Established 1974; 5 consecutive years. **Size:** 7.11 ha = 17.58 acres. **Description of Plot:** See AB 28:1053 (1974). **Weather:** Cool to moderately warm with temperatures 49°-72°F. Most count days were clear; one was cloudy with some light rain. **Coverage:** May 29-30; June 11-13, 23, 26, 30; 0535-0930. Total man-hours 8. **Census:** Field Sparrow, 15 (211, 85); Gray Catbird, 3 (42, 17); Com. Yellowthroat, 3; Indigo Bunting, 3; House Wren, 2; Golden-winged Warbler, 2; Cardinal, 2; Rufous-sided Towhee, 2; Wood Thrush, 1; Prairie Warbler, 1; Am. Goldfinch, 1; Chipping Sparrow, 1; Yellow-billed Cuckoo, +; Red-eyed Vireo, +; Yellow-breasted Chat, +; N. Oriole, +; Song Sparrow, +. **Total:** 17 species; 36 territorial males or females (506/km², 205/100 acres) **Visitors:** Ring-necked Pheasant, Ruby-throated Hummingbird, Com. Flicker, Downy Woodpecker, Great Crested Flycatcher, Tuf-

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ted Titmouse, Am. Robin, Cedar Waxwing, Blue-winged Warbler, Yellow Warbler. **Remarks:** A Field Sparrow nest was found. — **ROLAND BERGNER**, *William Penn Memorial Museum, Box 1026, Harrisburg, Pa. 17120.*

190. 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; 4 consecutive years. **Size:** 6.3 ha = 15.6 acres. **Description of Plot:** See AB 29:1140 (1975). **Coverage, 1977:** May 16, 27; June 7, 11, 17, 23; July 6, 18, 23; Aug. 4. Total man-hours: 4. **Census:** Field Sparrow, 9 (143, 58); Grasshopper Sparrow, 4 (63, 26); E. Meadowlark, 1; Red-winged Blackbird, 1; Am. Goldfinch, 1. **Total:** 5 species; 16 territorial males (253/km², 103/100 acres). **Remarks:** Nests found: Field Sparrow, 3. **Coverage, 1978:** May 12, 22, 31; June 7, 14, 22, 30; July 10, 17, 22; August 1, 18. Total man-hours: 6.1. **Census:** Field Sparrow, 10 (158, 64); Grasshopper Sparrow, 4 (63, 26); Red-winged Blackbird, 2; Yellow-breasted Chat, 1; E. Meadowlark, 1; Indigo Bunting, 1. **Total:** 6 species; 19 territorial males (301/km², 122/100 acres). **Remarks:** Nests found: Yellow-breasted Chat, 1; Red-winged Blackbird, 2; Indigo Bunting, 1; Field Sparrow, 4. — **PAUL W. WOODWARD**, *2433 Southgate Sq., Reston, Va. 22091.*

191. ORCHARD GRASS-TALL FESCUE MEADOW. — **Location:** Illinois; McLean Co., 6 mi S Gridley; T25N, R2E, SE 1/4, NW 1/4, Sec. 5, Normal Quadrangle, USGS. **Continuity:** Established 1976; 3 consecutive years. **Size:** 12.1 ha = 30 acres. **Description of Plot:** See AB 31:88-89 (1977). **Coverage:** June 10, 13, 20, 22, 30; July 1-3, 6-7, 9, 18, 20; 0600-0900 and 1800-2000 hours. Total man-hours: 18. **Census:** Red-winged Blackbird, 21 (173, 70); Dickcissel, 3 (25, 10); E. Meadowlark, 2

(15, 6); E. Kingbird, 1 (8, 3); Com. Yellowthroat, 1; Bobolink, 1; W. Meadowlark, 1; Ring-necked Pheasant, +; Mourning Dove, +; Barn Swallow, +; Com. Grackle, +; Am. Goldfinch, +. **Total:** 12 species; 30 territorial males (247/km², 100/100 acres). **Remarks:** The total population remained about the same as in 1975 and 1976. Dickcissels increased slightly (1 in 1976), although not regaining the 1975 level (6). The Red-winged Blackbird sex ratio was about 1:1 this year (23 females), compared to 19 males, 17 females in 1976 and 18:33 in 1975. — **DALE E. BIRKENHOLZ**, *Illinois State Univ., Normal, Ill. 61761.*

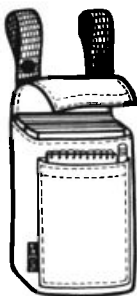
192. VALLEY GRASSLAND. — **Location:** California; Los Angeles Co., W half of Horse Flats; 34°17'40"N, 118°33'42"W. Oat Mountain Quadrangle, USGS. **Continuity:** New. **Size:** 8.13 ha = 20.08 acres (rectangular, 270 × 360 yds, measured with steel tape and compass). **Description of Plot:** Open valley grassland at base of the Santa Susana Mountains. Treeless with winter rain and hot dry summers. A dirt road runs N-S through the E half of the plot. Vegetation: Twenty-five 1/2 m² random circular plots were sampled to determine percent cover, percent species composition and standing height. Vegetation covers 58% of the plot. Oat (*Avena* sp.), Brome Grass (*Bromus* sp.) and Medick (*Medicago* sp.) comprise 42% of the stand; 44% is composed of Storksbill (*Erodium* sp.); and 7% is composed of Mustard (*Brassica* sp.). Together, these genera form a standing height of 20-30 cm. In addition, Horehound (*Marrubium vulgare*) comprises 6% (45-60 cm tall) of the stand while trace amounts of Dove Weed (*Eremocarpus setigerus*) and Loco Weed (*Astragalus* sp.) are present. **Topography:** Elevation 472 m (1150 ft), mildly sloping (2-3%) SE. **Edge:** Similar flat grassland on all sides. Beyond this lie moderately steep rolling foothills. **Water:** A seasonal stream lies 640 m to the SE.

Weather. Temperatures 51-96 F, with all counts occurring within 58°-70°F. Winter rainfall was extremely heavy, totaling 33.44 in. (norm is 14.01 in.). Precipitation measurements from the U.S. Weather Bureau Station in Los Angeles located 38 km SSE of the plot. Skies were clear during 5 counts and low overcast during 1. Wind on only 3 counts; 20, 10 and 5 mph respectively. **Coverage:** May 12-15, 20, 22; 0530-0730 hours. Total man-hours: 12. **Census:** Horned Lark, 5 (62, 25); W. Meadowlark, 1.5; Lark Sparrow, +. **Total:** 3 species; 6.5 territorial males (80/km², 32/100 acres). **Visitors:** Red-tailed Hawk, Prairie Falcon, Am. Kestrel, Mourning Dove, White-throated Swift, W. Kingbird, Com. Raven. **Remarks:** No nests were found. Mourning Doves were seen on every count and appeared to feed on the plot. Off-road vehicles occasionally used the plot and surrounding area. — **LAWRENCE K. AXELROD**, *19210 Clymer St., Northridge, Calif. 91326.*

193. SUBURBAN HOUSING DEVELOPMENT. — **Location:** Massachusetts; Plymouth Co., Jan Marie Dr., 3 mi SW of Plymouth Center; 41°56'N, 70°42'W, Plymouth Quadrangle, USGS. **Continuity:** New. **Size:** 15 ha = 37.07 acres (an approximate rectangle with sides running NE-SW and NW-SE, calculated from building plans). **Description of Plot:** This area lies at the edge of the Myles Standish State Forest, a Pitch Pine (*Pinus rigida*)/Scrub Oak (*Quercus ilicifolia*) community with 8 previously published Breeding Bird Censuses, see AB 27:975-977 (1973), AB 29:1101, 1105-1106 (1975), AB 31:51 (1977). The development, started in a c. 30 year old forest in 1973, was completed in 1977. Lot size averaged 2,074 m² (22,320 ft²) with a range of 1,858-10,002 m² (20,000-107,671 ft²) separated by paved roads 12.2 m (40 ft wide). All lots had new houses and most had surfaced driveways and newly planted lawns. The amount of original tree, shrub and herb layer present varied

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enormously although most lots had retained several to many Pitch Pines of height 3-5 m. Ornamental trees and shrubs were often present, but provided minimal nesting cover. Circa 10% of the owners had put up nest boxes. **Edge:** Bordered by further development to the NE and SE, an open grass field to the NW, and natural Pitch Pine/Scrub Oak forest to the SW. **Topography:** Essentially flat. **Elevation:** 160 ft. **Weather:** Observations were confined to days without precipitation but with light NW-S winds; temperature range 47°-68°F. **Coverage 1977:** June 2, 8, 14, 22-23, 27; July 5, 8, 11, 15; Aug. 8; 0500-0715, EDST. Total man-hours: 26. **Census:** Am. Robin, 6 (40, 16); Blue Jay, 5 (33, 13); Rufous-sided Towhee, 4 (27, 11); Chipping Sparrow, 4; N. Oriole, 3.5 (23, 9); Mourning Dove, 3 (20, 8); House Wren, 3; Starling, 2; Com. Grackle, 2; Tree Swallow, 1; House Sparrow, 1; Mockingbird, 0.5; Bobwhite, +; Rock Dove, +; Black-capped Chickadee, +; Cardinal, +. **Total:** 16 species; 35 territorial males (233/km², 94/100 acres). **Visitors:** Com. Flicker, Barn Swallow. **Remarks:** The original habitat was largely destroyed by the housing construction while new growth has had little time to mature. A comparison with an unpublished census from the same area in 1974 shows a drop of more than half in Rufous-sided Towhee territories (the most abundant species in 1974), and the establishment of Tree Swallow, Starling and House Sparrow territories with nests in artificial sites by 1977. The work was carried out with the assistance of 9 volunteers and intern staff of the Manomet Bird Observatory, to whom grateful thanks are expressed. — **TREVOR L. LLOYD-EVANS**, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.

194. SUBURBAN RESIDENTIAL. — **Location:** New Jersey; Mercer Co., Lawrenceville, between Princeton Pike and Lawrence-

ville Road about 1 mi S of Interstate 295, 40° 16' N, 74° 43' W, Princeton Quadrangle, USGS **Continuity:** New. **Size:** 5.83 ha = 14.4 acres (irregular, mapped from town tax assessment map). **Description of Plot:** Two-square-block area of uniform suburban subdivision bounded by Lumar Road (S, E); and Merritt Drive (N, W) and bisected by Allwood Drive. The plot includes 66 rectangular property lots of 7,300 to 14,400 ft², each privately owned and containing one single-family, split-level house built 20-25 years ago. No major roads or commercial structures are nearby. Detailed quantitative analysis of 8 randomly selected lots (10.9% of total area) gave the following results: Trees 3-in. diameter and over 30/acre; total basal area 21 ft²/acre. Species comprising 90% of the total number of trees: Silver Maple (*Acer saccharinum*), 6, 16, 22, 50; Green Ash (*Fraxinus pennsylvanica*), 6, 15, 24, 62; Red Cedar (*Juniperus virginiana*), 3, 8, 4, 50; Norway Maple (*A. platanoides*), 3, 7, 5, 37; Mimosa (*Albizia julibrissin*), 3, 7, 3, 37; Am. Crab (*Malus coronaria*), 3, 7, 6, 37; Sweetgum (*Liquidambar styraciflua*), 2, 5, 1, 12; White Oak (*Quercus alba*), 1, 3, 3, 12; Gray Birch (*Betula populifolia*), 1, 3, 2, 25; E. Hemlock (*Tsuga canadensis*), 1, 3, 5, 25; Weeping Willow (*Salix babylonica*), 1, 3, 8, 25; *Magnolia* ssp., 1, 3, 1, 25; Blue Spruce (*Picea pungens*), 1, 3, 1, 25; Pin Oak (*Q. palustris*), 1, 2, 4, 12; White Pine (*Pinus strobus*), 1, 2, 5, 12; Tuliptree (*Liriodendron tulipifera*), 1, 2, 1, 12. Trees by diameter size class: A (3-6 in.) 19, 49, 2, 14; B (6-9 in.) 11, 28, 3, 24; C (9-15 in.) 8, 20, 6, 46; D (15-21 in.) 1, 3, 2, 16. Shrub stems /acre about 250 (mostly yews, privets, dogwoods, cedars); ground cover about 60% (mostly lawn grasses); canopy cover 19%; average canopy height 23 ft (range 10-42). Paved streets cover 10% of the plot, paved driveways and sidewalks 10%, houses about 22%, and shrubs 4.5%. **Edge:** Bordered by similar suburban habitat on all sides. Nearest

open field about 50 m to W, 30 m utility right-of-way approaches within 50 m of NE corner. **Topography:** Essentially flat, but with slight downward slope toward Little Shaban-kunk Creek, about 200 m off NW corner. **Elevation:** 80-100 ft. **Weather:** Generally warm and humid, since late migration forced censusing in June and July. **Coverage:** June 1, 6, 13, 20, 27; July 11, 13; 0455-0810 hours. Total man-hours: 10. **Census:** Am. Robin, 11 (189, 76); House Sparrow, 10 (172, 69); Mockingbird, 4.5 (77, 31); Cardinal, 3.5 (60, 24); Song Sparrow, 3 (51, 21); Mourning Dove, 2; Blue Jay, 2; Com. Grackle, 2; House Finch, 2; Carolina Chickadee, 1; Starling, 1; Gray Catbird, +; Chipping Sparrow, +. **Total:** 13 species; 42 territorial and non-territorial males (721/km², 292/100 acres). **Visitor:** Com. Crow. **Remarks:** The age and vegetational maturity of this site attract a fairly diverse avifauna, with comparatively high proportions of strongly territorial species (61% by population), and tree-nesting species (plurality of 39% by population) for a suburban area. Most species were evenly distributed over the homogeneous site, except for a concentration of granivorous birds at the E end, where several feeders are operated year-round. The resident birds appeared primarily dependent on weed seeds, garden fruit, insects, and worms for food. Although several nest boxes had been erected to attract House Wrens, none were occupied. Territories of Am Robins were particularly difficult to outline because these birds usually ceased singing before dawn, although they remained active and visible all morning. Singing locations for grackles were notably inconsistent; consequently, the census figure is an estimate based on foraging patterns. All property owners were cooperative, but generally showed little interest in or concern for the resident avifauna. — **PATRICK S. ROMANO**, Dept of Biol., Princeton Univ., Princeton, N.J. 08540

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195. URBAN HABITAT. — **Location:** Washington, D C , The White House grounds, 1600 Pennsylvania Avenue. **Continuity:** Established 1972, 2 intermittent years. **Size:** 7.89 ha = 19.5 acres. **Description of Plot:** See AB 26:998-9 (1972). **Coverage:** Apr. 25; May 2, 10-11, 17, 30; June 6, 16, 20; 0545-0730 and 1915-2025, EDST. Total man-hours: 11.3. **Weather:** Generally clear, no strong winds or rain, calm, 50°-65°F near end of survey period; generally cooler than normal for period. **Census:** Starling, 8 (101, 41); Am. Robin, 6 (76, 31); Mourning Dove, 5 (63, 26); Gray Catbird, 4 (51, 21); Mockingbird, 3 (38, 15), Com. Grackle, 2; Cardinal, 2; House Finch, 2; Downy Woodpecker, 1; Blue Jay, 1; Fish Crow, 1; House Sparrow, 1; Song Sparrow, 1; Rock Dove, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 16 species; 37 territorial males (469/km², 190/100 acres). **Visitors:** Chimney Swift, Com. Crow, House Wren, Bewick's Wren, Brown Thrasher, Wood Thrush, Red-eyed Vireo, N. Oriole, Rufous-sided Towhee. **Remarks:** Nests found: Am Robin, 4; Starling, 4; Mourning Dove, 3; Gray Catbird, 2; Com. Grackle, 2; Mockingbird, 1. **Remarks:** Grounds keepers try to reduce nesting of Rock Doves, Starlings and House Sparrows, resulting in many fewer nests than their daily population would indicate. Robins nested successfully on the front and side porticos of the White House within 5-10 ft of thousands of passing tourists. Mourning Doves nest each year on an abacus of the West Wing colonnade pillars outside the President's office. Security personnel are active within 10 ft of the nests most of each 24 hours. — *FRED*

G EVENDEN, 7805 English Way, Bethesda, Md

196. PITCH PINE-SCRUB OAK FOREST II. 15-YEAR REGENERATION. **Location:** Massachusetts; Plymouth Co., Myles Standish State Forest, 1-3/4 mi E of College Pond; 41° 52' N, 70° 38' W, Wareham Quadrangle, USGS. **Continuity:** Established 1973; 2 intermittent years. **Size:** 7.5 ha = 18.53 acres. **Description of Plot:** See AB 27:976 (1973). In the intervening five years the live Pitch Pines (*Pinus rigida*) increased in height, while the number of standing dead trees declined sharply from decay and winter storms. **Weather:** Fairly clear without precipitation; winds light, mostly S-SW-W; temperature range 10°-19°C. **Coverage:** May 23, 31; June 2, 5, 7, 12, 15, 17, 19, 21, 23, 26, 28, 30; 0600-0900, EDST, and one 2 hour census of nocturnal species starting at dusk. Total man-hours: 51. **Census:** Prairie Warbler, 21 (280, 113); Rufous-sided Towhee, 11.5 (153, 62); Field Sparrow, 8 (107, 43); Com. Yellowthroat, 7.5 (100, 40); Black-and-white Warbler, 7 (93, 38); Am. Goldfinch, 2.5; Whip-poor-will, 2; Black-capped Chickadee, 2; Brown Thrasher, 2; Brown-headed Cowbird, 2; Blue Jay, 1; Gray Catbird, 1; House Wren, 0.5; Mockingbird, 0.5; Hermit Thrush, 0.5. **Total:** 15 species; 69 territories (920/km², 372/100 acres). **Visitors:** Mourning Dove, Tree Swallow, Fish Crow, Com. Grackle. **Remarks:** Previously published censuses were carried out in identical vegetation 0, 1, 2, 10 and 30 years after fire. This 15-year old succession showed a similar diversity to the 10-

year plot (our previous maximum), and more total territories than any other plot. The Prairie Warbler density represents a peak in this area of the NE, but the decay of trees killed by the fire has reduced numbers of cavity nesters from the level seen in the 10-year succession. The work was carried out with the assistance of John A. Douglas and 7 of the other intern staff at Manomet Bird Observatory whose invaluable assistance is gratefully acknowledged. — *TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Manomet, Mass. 02345.*

197. HICKORY - OAK - ASH FLOOD-PLAIN FOREST. — **Location:** Maryland, Howard Co., Middle Patuxent River, due W of Hobbits Glen Golf Course, Columbia; 39° 13' 10" N, 76° 54' 45" W, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; 7 intermittent years. **Size:** 18.4 ha = 45.5 acres. **Description of Plot:** The dominant canopy trees are Pin Oak (*Quercus palustris*), White Ash (*Fraxinus americanus*), Am. Elm (*Ulmus americana*), and Red Maple (*Acer rubrum*). Most prominent in the understory are Am Hornbeam (*Carpinus caroliniana*) and Flowering Dogwood (*Cornus florida*). The ground cover is predominantly Japanese Honeysuckle (*Lonicera japonica*), Wood-nettle (*Laportea canadensis*), and Poison Ivy (*Rhus radicans*), however, the following species also are common: Virginia Creeper (*Parthenocissus quinquefolia*), Jewelweed (*Impatiens* sp.), Trout-lily (*Erythronium americanus*), Mayapple (*Podophyllum peltatum*), False Spikenard (*Smilacina racemosa*), Christmas Fern (*Poly-*

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stichum acrostichoides), New York Fern (*Dryopteris noveboracensis*) and Royal Fern (*Osmunda regalis*). The quantitative vegetation survey published last year (*AB* 32:59, 1978) based on 7 circular 0.1-acre samples was found to be too small a sample and was supplemented with 5 additional 0.1-acre counts to give the following revised habitat description: Trees 3-in. dbh and over, 164/acre; total basal area, 94.7 sq ft/acre. Species comprising 93% of the total number of trees: Pin Oak, 24, 15, 31.5, 75; Red Maple, 26, 16, 17.1, 50; Am Elm, 19, 12, 5.4, 50; dead trees, 18, 11, 14.3, 83; Am. Hornbeam, 27, 16, 3.7, 58; White Ash, 10, 6, 9.6, 33; Bitternut Hickory (*Carva cordiformis*), 5, 3, 2.9, 25; Tulip-tree (*Liriodendron tulipifera*), 4, 3, 2.3, 25; Black Cherry (*Prunus serotina*), 4, 3, 2.0, 42; Black Haw (*Viburnum prunifolium*), 4, 3, 0.4, 17; Black Walnut (*Juglans nigra*), 3, 2, 2.4, 33; Sycamore (*Platanus occidentalis*), 3, 2, 2.1, 17; Black Willow (*Salix nigra*), 3, 2, 1.1, 17; grape (*Vitis* sp.), 3, 2, 0.4, 17. Trees by diameter size class: A (3-6 in.) 72, 44, 7.3, 8; B (6-9 in.) 30, 18, 9.0, 10; C (9-15 in.) 42, 25, 33.3, 35, D (15-21 in.) 14, 9, 25.5, 27; E (21-27 in.) 5, 3, 15.5, 16; F (27-33 in.) 1, 1, 4.1, 4. Shrub stems /acre, 15.175; ground cover 39%; canopy cover 73%; average canopy height 105 ft (range 83-116). For soils see *AB* 32:59 (1978) **Edge, Topography, and Elevation:** See *AB* 32:59. **Coverage:** May 20, 27, 29; June 14; July 1, 7, 10, 13. Surveys started within 10 minutes of sunrise and lasted an average of 3.3 hours Total hours: 26. **Census:** Gray Catbird, 36 (196, 79); Acadian Flycatcher, 20.5 (111, 45), Red-eyed Vireo, 14 (76, 31); Wood Thrush, 11.5 (62, 25); Cardinal, 9 (49, 20); Tufted Titmouse, 8 (43, 18); Am. Redstart, 8; Red-bellied Woodpecker, 6.5 (35, 14); White-eyed Vireo, 6 (33, 13); Yellow-billed Cuckoo, 5.5 (30, 12); Downy Woodpecker, 5.5; Veery, 5.5, Com. Yellowthroat, 5.5; E. Wood Pewee, 5

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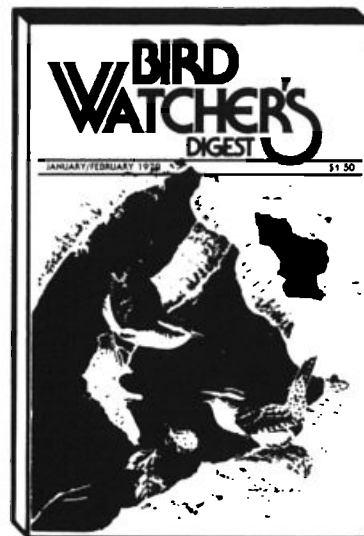


(27 11) Mourning Dove 3 5 (19 8) Blue gray Gnatcatcher, 3.5; Com. Flicker, 3 (16, 7); Carolina Chickadee, 3; N. Parula, 3; Brown-headed Cowbird, 3; Scarlet Tanager, 2.5; Hairy Woodpecker, 2; Louisiana Waterthrush, 2; Kentucky Warbler, 2; Rufous-sided Towhee, 2; White-breasted Nuthatch, 1.5; Yellow-throated Vireo, 1.5; Ruby-throated Hummingbird, 1; Blue Jay, 1; Am. Robin, 1; Starling, 1; Cerulean Warbler, 1; Red-shouldered Hawk, 0.5; Pileated Woodpecker, 0.5; Indigo Bunting, 0.5; Green Heron, +; Mallard, +; Turkey Vulture, +; Am. Woodcock, +; Belted Kingfisher, +; Com. Crow, +; Carolina Wren, +; Brown Thrasher, +; Hooded Warbler, +; Am. Goldfinch, +. **Total:** 45 species; 185.5 territorial males (1007/km², 408/100 acres). **Remarks:** Total species and territorial males were near normal, but warbler numbers were low for the third consecutive year. — **CHANDLER S. ROBBINS**, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.

198. UPLAND TULIP - TREE - MAPLE-OAK FOREST. — **Location:** Maryland; Howard Co., W edge of Middle Patuxent River Valley, SW of the Hobbits Glen Golf Course at Columbia; 39°12'55"N, 76°54'40"W, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; 8 consecutive years. **Size:** 11.98 ha = 29.6 acres. **Description of Plot:** See *AB* 32:61-62 (1978). **Coverage:** May 19, 21, 26; June 23; July 4, 6, 11-12. Surveys started within 5 minutes of sunrise and lasted an average of 2.1 hours. Total hours: 17. **Census:** Red-eyed Vireo, 16 (134, 54); Wood Thrush, 14.5 (121, 49); Acadian Flycatcher, 9 (75, 30); Gray Catbird, 6 (50, 20); Cardinal, 5 (42, 17); Veery, 4.5 (38, 15); Tufted Titmouse, 4 (33, 14); Scarlet Tanager, 4; Kentucky Warbler, 3.5 (29, 12); Red-bellied Woodpecker, 2.5; E.

Wood Pewee 2 5 Hooded Warbler 2 5, Downy Woodpecker, 2; Carolina Chickadee, 2; Com. Flicker, 1.5; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Blue-gray Gnatcatcher, 1; Ovenbird, 1; N. Oriole, 1; Brown-headed Cowbird, 1; Rufous-sided Towhee, 1; Hairy Woodpecker, 0.5; Red-shouldered Hawk, +; Barred Owl, +; Blue Jay, +; Com. Crow, +; Yellow-throated Vireo, +; N. Parula, +. **Total:** 29 species; 87 territorial males (726/km², 294/100 acres). **Remarks:** Although the total species dropped

to a new low this summer, the number of territorial males per 100 acres was only slightly below the 8-year mean of 300. The greatest change continues to be the continuing decrease ($p < 0.001$) in number of territorial male wood warblers. Warblers have dropped from 18.5 pairs in 1971 to 7 pairs in 1978; the number of warbler species has been variable from year to year, ranging from 5 to 9, but dropped to a new low of 4 species in 1978. The beginning of housing construction one-quarter mile away across the river is not



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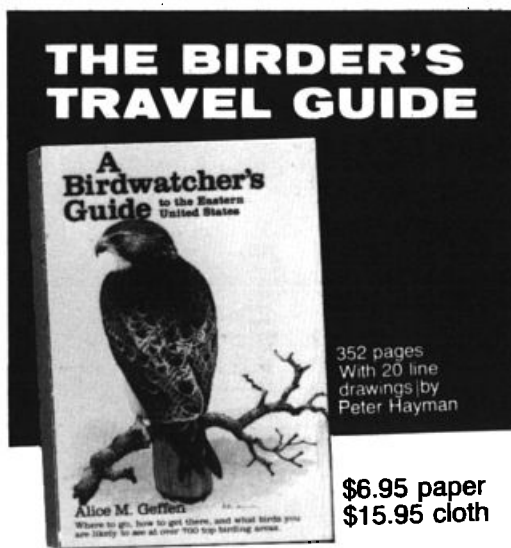
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believed to have had any important effect to date on bird populations of this study plot — CHANDLER S. ROBBINS, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.

199. COASTAL SAGE SCRUB. — **Location:** California; Orange Co., Lower Santiago Regional Park, Rinker's side of Blume Ranch, 4 mi E of Windes road end; 33°49'12"N, 117°45'57"W, Orange Quadrangle, USGS. **Continuity:** New. **Size:** 6.0 ha = 14.8 acres. Longest side 350 m, width 225 m, surveyed with theodolite and 50 m steel tape. **Description of Plot:** The plot was situated on a hillside with SW exposure. A ravine drainage bisected the plot forming slopes facing SE & NW, a third SE facing slope joined the NW facing slope forming a ridge. Average vegetation height 0.86 m; coverage 75.9% determined by line intercept sampling. Plant species in order of dominance were: *Salvia mellifera* 42.3%,

Artemisia californica 22.9%, *Malacothamnus fasciculatus* 17.6%, *Eriogonum fasciculatum* 4.6%, *Rhus integrifolia* 4.0%, *Baccharis glutinosa* 3.0%, the remaining 5.6% consisted of *Artemisia vulgaris*, *Urtica holoserica*, and *Heteromeles arbutifolia*. **Edge:** A dirt fire road bordered the S and W sides of the plot. The N side was adjacent to an area approx. 100 m × 75 m consisting primarily of *Brassica* sp., which faded back into coastal scrub vegetation. The E and W sides bordered similar vegetation type and the S side was within close range of an ecotone between the Coastal Sage Scrub and a Riparian Woodland. Santiago creek was situated about 150 m S and 15 m below the plot and was flowing during the censusing. **Topography:** A horse trail transected the plot from S to N. Elevation ranged from 500 to 800 ft. **Weather:** Temperature ranged from cool to moderate with about half the days exhibiting early morning low clouds or fog breaking by mid-morning.

Coverage: May 1, 3-6, 8, 9, 11, 12, 16, 20, 22-24, 0530-1000, PDT May 6 & 20 were also censused at 2030-2200, PDT. Total man-hours: 77.65. **Census:** Wrentit, 12 (200, 81), Brown Towhee, 4.5 (75, 30); Rufous-sided Towhee, 3.5 (58, 24); Scrub Jay, 1.5; California Thrasher, 1.5; California Quail, 1; Ash-throated Flycatcher, 1; Bewick's Wren, 1, Lazuli Bunting, 1. **Total:** 9 species; 27 territorial males (451/km², 182/100 acres) **Visitors:** Turkey Vulture, Red-tailed Hawk, Mourning Dove, Great Horned Owl, Anna's Hummingbird, Cliff Swallow, Common Crow, Com. Raven, Com. Bushtit, Phainopepla, Western Meadowlark, House Finch, American Goldfinch, Lesser Goldfinch. **Remarks:** Owing to property lines our plot size was limited to 14.8 acres rather than the conventional minimum of 15. Many thanks to Charles Schneebeck of Fullerton College for his aid in research. — TERRY CATLIN, RICK MARTIN, and JEFF ROGERS.

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