

Com. Flicker were seen on 5 of the 6 trips. The Red-tailed Hawk was seen on the study area 3 times. Black-bellied Plover, Whimbrel, Tree Swallow, Com. Crow, Starling, and Lesser Goldfinch were recorded only at the end of the survey period; but Com. Crow was seen on every trip in adjacent areas. Waterfowl were concentrated on the 40-acre lake. The *Falco* sp., a Prairie or Peregrine, was distantly seen once. Approximately half the Mallards were wild-type birds while the rest were white "Peking" or intermediate types. The Anna's Hummingbird and Loggerhead Shrike were showing signs of territoriality.—*BRAD R. BLOOD*, Dept. of Biology, Calif. St. Univ., Long Beach, CA 90840, and *JANET L. VIERHELLER*, 5368 La Pasada St., Long Beach, CA 90815.

82. SUBURBAN NATURE CENTER. —
Location: California; Los Angeles Co., El Dorado Nature Center, Long Beach. Bounded on N by Spring St., S by Willow St., E by Long Beach Tree Farm, W by San Gabriel River. 33°47'N, 118°08'W, Quadrangle, USGS. **Continuity:** Established 1971: 7 years. **Size:** 32.38 ha = 80 acres (rectangu-

lar, ½ mi N-S, ¼ mi E-W). **Description of Plot:** See AB 25: 656 (1971). **Weather:** Mild during the survey with a mean high of 70°F and a mean low of 48° (range 38-89°). Precipitation totaled 3.55 in., including 2.35 on Jan. 28-29. **Coverage:** Dec. 23; Jan. 14, 20, 26, 29; Feb. 4, 11, 16. Eight trips, 0700-1130, averaging 140 min each. **Count:** White-crowned Sparrow, 68 (210, 85); Yellow-rumped Warbler, 52 (161, 65); Am. Goldfinch, 42 (130, 53); Bushtit, 36 (111, 45); Cedar Waxwing, 36; House Finch, 31 (96, 29); Anna's Hummingbird, 21 (65, 26); Am. Wigeon, 20 (62, 25); Lincoln's Sparrow, 16 (49, 20); Mockingbird, 15 (46, 19); Ruby-crowned Kinglet, 14 (43, 18); Song Sparrow, 14; Hermit Thrush, 12 (37, 15); Am. Robin, 10 (31, 13); Lesser Goldfinch, 10; Blue-gray Gnatcatcher, 9 (28, 11); Com. Yellowthroat, 9; Mallard, 7 (22, 9); Am. Coot, 7; Orange-crowned Warbler, 7; Fox Sparrow, 7; Gadwall, 5 (15, 6); Scrub Jay, 5; N. Shoveler, 4 (12, 5); Canvasback, 4; Ruddy Duck, 4; Mourning Dove, 4; Pied-billed Grebe, 3 (9, 4); Com. Flicker, 3; Black Phoebe, 3; House Wren, 3; Loggerhead Shrike, 3; Starling, 3; Purple Finch, 3; Chipping Sparrow, 3;

Golden-crowned Sparrow, 3; Double-crested Cormorant, 2 (6, 3); Cinnamon Teal, 2; Spotted Dove, 2; Tree Swallow, 2; Brown Towhee, 2; Great Egret, 1 (3, 1); Green-winged Teal, 1; Sharp-shinned Hawk, 1; Red-tailed Hawk, 1; Red-shouldered Hawk, 1; Am. Kestrel, 1; Caspian Tern, 1; Belted Kingfisher, 1; Com. Crow, 1; Yellow-rumped Warbler, 1; Black-throated Gray Warbler, 1; Townsend's Warbler, 1; House Sparrow, 1; Great Blue Heron, 1; Green Heron, +; Snowy Egret, +; Am. Bittern, +; Pintail, +; Ring-necked Duck, +; White-tailed Kite, +; Greater Yellowlegs, +; *Selasphorus* sp., +; Com. Flicker, +; W Flycatcher, +; Bewick's Wren, +; Long-billed Marsh Wren, +; Red-winged Blackbird, +; Brazilian Cardinal, +; Rufous-sided Towhee, +; Swamp Sparrow, + **Average Total:** 519 birds (1603/km², 649/100 acres). **Remarks:** Total species, 71. On Feb 16, 121 Am. Wigeons were seen, the previous high was 6. A group of 12 Tree Swallows were seen on Feb. 11, the only time they were recorded.—*BRIAN E. DANIELS*, Dept. of Biol., California St. Univ. and 3471 Lama, Long Beach, CA 90808.

Forty-fifth Breeding Bird Census

Edited by Willet T. and Aldeen C. Van Velzen

List of Censuses

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs. obs.	Species	Yrs. of study
1. Birch-Maple Forest I	Nova Scotia	12.8	923	43	25	1
2. Birch-Maple Forest II	Nova Scotia	7.2	764	22	13	1
3. Birch-Maple Forest III	Nova Scotia	5.6	1128	21	23	1
4. Second-growth Hardwood Forest	Connecticut	10.1	988	11	37	15
5. Beech-Maple-Birch Forest	New York	20.0	563	47	21	1
6. Beech-Maple Forest	New York	6.5	499	7	19	1
7. Young Mixed Forest	New York	4.4	589	8	27	5
8. Young Red Maple-Gray Birch Forest	New York	8.1	1001	14	31	6
9. Mature Deciduous Floodplain Forest	Maryland	7.6	797	27	30	31
10. Mixed Hardwood Forest	Maryland	11.3	918	16	45	17
11. Mixed Upland Habitat	Dist. of Columbia	14.2	801	26	25	22
12. Beech-Cherry-Basswood	West Virginia	6.1	370	8	11	1
13. Black Cherry-Red Maple Forest	West Virginia	6.1	288	9	9	1
14. Maple-Beech-Birch Forest	West Virginia	6.1	445	10	16	1
15. Oak-Maple-Hickory Forest	West Virginia	6.1	420	9	13	3
16. Red Oak-Hickory Forest	West Virginia	6.1	498	10	20	2
17. Red Oak-Red Maple	West Virginia	6.1	461	7	26	3
18. White Oak-Hickory Forest	West Virginia	6.1	313	7	10	3
19. Mixed Oak and Pine Forest	Virginia	8.1	272	13	18	1
20. Oak-Hickory-Tulip-tree Forest	Virginia	13.5	326	18	17	3
21. Upland Oak-Hickory Forest	Virginia	11.0	718	66	22	9
22. Floodplain Forest	North Carolina	13.0	593	19	27	5
23. Mixed Deciduous Forest	North Carolina	8.8	374	28	16	8
24. Mixed Deciduous Forest	North Carolina	12.6	526	19	26	6
25. Hardwood Swamp Forest	South Carolina	8.1	1476	17	24	2
26. Swamp Hardwood Forest I	South Carolina	8.1	1075	24	21	1
27. Swamp Hardwood Forest II	South Carolina	8.1	1174	24	21	1
28. Swamp Hardwood Forest III	South Carolina	8.1	1297	24	20	1
29. Swamp Hardwood Forest IV	South Carolina	8.1	1124	24	21	1
30. Virgin Hardwood Bottomland Swamp Forest	South Carolina	8.1	741	32	22	2
31. Mature Beech-Magnolia Forest	Florida	15.8	530	25	30	2
32. Silver Maple Swamp	Ontario	9.9	616	22	31	1
33. Upland Maple Forest	Ontario	10.0	350	20	22	1

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs obs.	Species	Yrs of study
34. Wooded City Ravine	Ontario	20.0	210	20	15	12
35. Elm-Ash-Birch Forest	Minnesota	8.7	1172	27	29	2
36. Mature Aspen-Northern Hardwoods Forest	Minnesota	13.9	473	18	19	3
37. Mature Birch-Aspen	Minnesota	8.1	309	16	13	1
38. Upland Maple-Oak Forest	Wisconsin	5.4	269	8	11	5
39. Aspen Clearcut	Minnesota	9.9	116	16	10	1
40. Aspen Clearcut	Minnesota	10.6	268	18	16	1
41. Aspen Clearcut	Michigan	9.0	211	13	14	2
42. Aspen Clearcut	Michigan	18.5	279	20	34	3
43. Mature Mixed Hardwood Forest	Michigan	9.3	1166	25	28	8
44. Oak-Hickory Forest	Illinois	6.0	826	22	22	1
45. Oak-Hickory-Maple Forest Interior	Illinois	13.0	247	11	21	6
46. Black Oak-Sassafras Woods	Indiana	22.2	108	37	11	8
47. Neotoma Valley	Ohio	20.2	460	120	33	4
48. Virgin Beech-Maple Forest	Ohio	6.1	1203	13	25	7
49. Ozark Oak-Hickory Forest, Second Growth	Missouri	7.9	611	25		2
B. Eastern—Coniferous—Deciduous (Mixed)						
50. Maple-Pine-Oak Second-growth Forest	Massachusetts	11.8	377	25	23	6
51. Climax Hemlock-White Pine Forest	Connecticut	10.5	965	14	35	15
52. Red Pine Plantation-Climax Hemlock Forest	Connecticut	8.1	568	53	30	1
53. White Pine-Hemlock-Northern Hardwoods Forest	Connecticut	14.3	352	20	32	2
		14.3	511	34	31	3
54. Beech-Spruce-Hemlock Forest	New York	23.9	549	44	21	2
55. Beech-Spruce-Maple Forest	New York	19.4	511	45	19	2
56. Second-growth Oak-Pine Forest	New York	9.3	538	33	14	5
57. Pitch Pine-Scrub Oak Barrens	New York	9.7	465	25	5	5
58. Upland Maple-Hemlock Forest	New York	10.6	808	20	17	1
59. Upland Mixed Pine-Spruce-Hardwood Plantation	New York	16.6	560	20	35	8
60. Mixed Oak-Pine Forest I	Pennsylvania	6.0	676	36	29	5
61. Mixed Oak-Pine Forest II	Pennsylvania	11.1	493	45	31	5
62. Central Hardwood Forest with Scattered Pine	Dist. of Columbia	26.3	177	27	23	24
63. White Pine-Oak Forest	West Virginia	6.1	502	9	24	3
64. Mountain Top Habitat	Virginia	6.1	264	9	9	1
65. Forested Stream Gorge I	Wisconsin	19.4	413	33	38	1
66. Forested Stream Gorge II	Wisconsin	19.4	655	33	48	1
67. Forested Stream Gorge III	Wisconsin	19.4	856	33	39	1
68. Forested Stream Gorge IV	Wisconsin	19.4	800	33	43	1
69. Mature Aspen-Fir	Minnesota	11.2	179	18	14	1
70. Mixed Successional Aspen-Oak-Conifer Forest	Minnesota	8.9	789	32	16	2
71. Mixed Pine-Deciduous Forest	Louisiana	8.9	528	16	21	1
C. Eastern—Coniferous						
72. Young Spruce Forest	Maine	3.2	1035	6	20	4
73. Red Pine Plantation	Connecticut	8.5	1100	11	43	4
74. Jack Pine Forest I	New York	3.8	454	30	11	1
75. Jack Pine Forest II	New York	9.0	367	30	13	1
76. Jack Pine Forest III	New York	9.0	295	30	14	1
77. Jack Pine Forest IV	New York	9.0	250	30	15	1
78. Jack Pine Forest V	New York	9.0	228	30	15	1
79. Jack Pine Forest VI	New York	9.0	272	30	19	1
80. Jack Pine Forest VII	New York	9.0	306	30	19	1
81. Mixed Pitch Pine-Jack Pine Forest	New York	9.0	306	30	17	1
82. Upland Scotch Pine Plantation	New York	9.3	919	22	26	13
83. Atlantic White Cedar	Virginia	6.9	1050	36	20	2
84. Atlantic White Cedar	North Carolina	6.9	1057	36	16	2
85. Longleaf Pine Forest	South Carolina	8.1	509	16	22	1
86. Mature Longleaf Pine Forest	Georgia	20.0	480	22	35	2
87. Cutover Subtropical Slash Pine Forest	Florida	20.2	77	24	9	2
88. Virgin Subtropical Slash Pine Forest—February Burn	Florida	5.8	292	5	12	1
89. Virgin Subtropical Slash Pine Forest—December Burn	Florida	4.4	458	7	10	1
90. Virgin Subtropical Slash Pine Forest—Summer Burn	Florida	5.8	275	6	10	1
91. Virgin Subtropical Slash Pine Forest—Unburned Control	Florida	2.9	137	5	4	1
92. Jack Pine-Black Spruce Forest	Michigan	17.5	392	104	20	2
D. Eastern—Mixed Habitat						
93. Mixed Upland Habitat and Swamp	Connecticut	14.2	226	11	30	14
94. Oak Forest, Pastures and Thickets	Connecticut	14.2	611	28	32	3
		14.2	466		31	3
95. Upland Brushy Pasture	Connecticut	8.5	1083	11	36	15
96. Deciduous Forest with Pond and Brook	New Jersey	16.2	327	12	29	18

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs obs.	Species	Yrs of study
97. Brushy Field and Wooded Edge	Pennsylvania	7.5	604	14	23	4
98. Red Oak-American Basswood Savannah	Ontario	7.5	1242	18	2	
99. Regenerating Old Field	Ontario	7.3	1151	24	80	1
100. Urban Park with Pond	Ontario	10.9	494	27	26	1
101. Mixed Wetland with Tamarack and Aspen Groves	Wisconsin	16.9	756	14	34	5
102. Disturbed Oak-Hickory Forest	Ohio	14.2	579	20	37	43
103. Deciduous Clearcut	Tennessee	20.2	450	24	21	7
104. Disturbed Mixed—Mesophytic Woodland Ravine	Tennessee	9.8	880	18	28	1
105. Mixed—Mesophytic Woods, Fields, and Brush	Tennessee	30.0	311	45	38	5
106. Suburban Cemetery	Alabama	15.0	601	37	26	3
		15.0	541	37	27	4
E. Central—Prairie						
107. Tall Grass Prairie	Illinois	12.1	264	10	9	6
108. Kentucky Blue Grass Prairie	North Dakota	4.9	113	3	10	10
109. Mixed Prairie I	North Dakota	10.0	215	10	17	10
110. Mixed Prairie II	North Dakota	6.1	82	3	12	10
111. Mixed Prairie III	North Dakota	6.1	74	4	7	10
112. Mixed Prairie IV	North Dakota	6.1	98	5	10	10
113. Mixed Prairie V	North Dakota	6.1	139	6	11	10
114. Mixed Prairie VIII	North Dakota	8.7	69	4	13	6
115. Floodplain Tallgrass Prairie	Kansas	10.1	297	5	5	8
F. Central—Disturbed Habitat						
116. Improved Pasture and Oak-Pine Forest	Oklahoma	9.1	774	27	27	3
117. Mixed Habitat—Disturbed Bottomland	Oklahoma	40.5	326	37	42	10
118. Oak-Pine Ravine Forest with Clearings	Oklahoma	7.4	803	24	22	3
G. Central—Shelter Belts						
119. Immature Three-row Belt	Minnesota	0.2	3119	4	4	3
120. Immature Four-row Belt	Minnesota	0.3	4365	9	6	3
121. Immature Nine-row Belt	Minnesota	0.8	1847	10	10	3
122. Mature Three-row Belt	Minnesota	0.3	1544	6	3	3
123. Mature Eight-row Belt	Minnesota	0.4	5237	11	12	3
124. Mature Five-row Belt	Minnesota	0.7	3337	14	8	3
125. Mature Four-row Belt	Minnesota	0.7	2801	18	12	3
H. Central—Deciduous						
126. River Bottom Forest	Manitoba	14.0	379	22	21	5
127. American Elm-Cottonwood-Black Ash Lowland Forest	North Dakota	1.1	961	3	11	1
128. Boxelder-Black Ash-American Elm Lowland Forest	North Dakota	0.8	1112	3	12	1
129. Boxelder-Cottonwood-Elm-Ash Lowland Forest	North Dakota	1.3	1351	3	15	1
130. Bur Oak-Green Ash Forest	North Dakota	3.2	710	5	10	1
131. Bur Oak-Green Ash Thicket	North Dakota	4.4	977	7	17	1
132. Bur Oak-Green Ash-Quaking Aspen Forest	North Dakota	3.1	1154	5	22	1
133. Mature Quaking Aspen Forest	North Dakota	4.1	754	8	21	1
134. Quaking Aspen-Green Ash Forest	North Dakota	4.1	803	7	22	1
135. Black Ash-Quaking Aspen Forest	North Dakota	4.1	519	6	19	1
136. Riparian Willow Shrub	North Dakota	1.3	2008	3	11	1
137. Willow-Saskatoon Serviceberry Floodplain Thicket	North Dakota	1.3	2394	6	13	1
138. Saskatoon Serviceberry Thicket	North Dakota	1.3	734	3	7	1
139. Oak-Hickory Forest	Kansas	8.1	531	26	19	1
140. Oak-Hickory Forest I	Kansas	8.1	482	16	19	4
141. Oak-Hickory Forest II	Kansas	8.1	346	15	18	4
142. Oak-Hickory Forest III	Kansas	8.1	661	24	22	4
143. Oak-Hickory Forest IV	Kansas	8.1	531	18	24	4
144. Oak-Hickory Forest V	Kansas	8.1	556	25	26	4
145. Oak-Hickory Forest VI	Kansas	8.1	531	24	26	4
146. Deciduous Floodplain Forest	Oklahoma	6.7	1258	27	24	3
I. Western—Deciduous						
147. Gambel's Oak-Mountain Mahogany Woodland	Colorado	18.4	136	30	9	3
148. Scrub Oak-Mountain Mahogany Woodland	Colorado	8.0	231	21	13	2
149. Maple-Boxelder Creekbottom	Utah	11.1	749	95	15	1
150. Coast Live Oak Riparian Woodland	California	6.9	915	36	26	1
151. Creekside Willow Woodland	California	6.1	1639	24	23	1
152. Sycamore-Coast Live Oak Riparian Woodland	California	7.2	694	67	17	2
153. Willow-Riparian	California	3.1	2305	15	15	1

Habitat		State or Province	Hectares	Pairs per sq. km.	Hrs obs.	Species	Yrs of study
J. Western—Coniferous							
154. Burned Pine–Fir Forest	California	8.4	213	27	21	1	
155. Mature Pine–Fir Forest	California	8.4	213	28	15	1	
K. Western—Coniferous-Deciduous (Mixed)							
156. Ponderosa Pine–Scrub Oak Forest	Colorado	12.0	225	20	13	2	
157. Ponderosa Pine–Scrub Oak–Mt. Mahogany Woodland	Colorado	9.1	395	55	11	15	
158. Riparian Woodland–Live Oak–Juniper	Arizona	9.2	1872	54	42	2	
		9.2	1697	36	36	3	
L. Western—Mixed Habitat							
159. Mountain Meadow and Open Coniferous Forest	Colorado	13.0	413	101	24	1	
160. Urban Cat-tail Marsh and Cottonwood Woodland	Colorado	3.5	943	27	16	1	
161. Campground in Old Orchards	Utah	10.1	692	29	21	1	
162. Slickrock–Ponderosa Pine–Pygmy Forest–Chaparral	Utah	16.2	306	32	17	2	
163. Scattered Mixed Coniferous Forest	Oregon	32.4	161	17	11	9	
164. Stable Coastal Sand Dunes	California	9.4	607	23	11	1	
165. Urban Park–Lake, Marsh and Mixed Forest	California	5.0	2064	19	20	1	
166. Urban Park–Mature Mixed Coniferous Forest	California	8.4	764	14	14	1	
M. Western—Desert and Scrub							
167. Desertscrub–Riparian	Arizona	20.2	410	50	25	1	
168. Coastal Sage Scrub I	California	8.1	507	18	14	1	
169. Coastal Sage Scrub II	California	8.1	371	19	13	1	
170. Coastal Sage Scrub III	California	8.1	253	14	9	1	
171. Coastal Scrub	California	8.1	575	205	14	9	
172. Disturbed Coastal Scrub A	California	4.7	607	98	18	9	
173. Disturbed Coastal Scrub B	California	8.1	587	264	16	10	
174. Colorado Desert Floodplain	California	20.3	214	15	14	1	
175. Palo Verde–Chuparosa Desert Wash	California	12.6	441	15	16	1	
176. Palo Verde–Cheesebush–Chuparosa Desert Wash	California	23.5	359	19	17	1	
N. Northern—Tundra and Taiga							
177. Inland Coastal Tundra	Alaska	100.0	115	275	19	6	
178. Wet Coastal Plain Tundra	Alaska	110.0	138	776	19	3	
179. Aspen Forest	Manitoba	16.0	296	22	16	5	
180. Low Arctic Tundra	Manitoba	16.2	102	8	10	1	
O. Wetlands							
181. Shrubby Swamp and Spruce Hummocks	Connecticut	8.1	2422	14	34	15	
182. Cat-tail–Bulrush Swamp	New Jersey	5.9	622	16	4	2	
183. Freshwater Marsh with Scattered Trees	New Jersey	5.0	767	12	7	2	
184. Cat-tail Marsh	New York	9.7	664	7	21	3	
185. Cat-tail Marsh	Ontario	7.5	3219	27	9	1	
186. Cordgrass Salt Marsh I	Florida	25.0	120	16	4	1	
187. Cordgrass Salt Marsh II	Florida	25.0	164	16	6	1	
188. Gulf Coast Salt Marsh	Florida	31.0	213	168	3	2	
189. Closed Black Spruce Bog	Minnesota	17.5	280	17	12	2	
190. Open Black Spruce Bog	Minnesota	5.0	300	7	8	2	
191. Shrub Swamp	Minnesota	12.5	816	14	13	2	
192. Open Bog	Minnesota	10.0	750	8	6	2	
193. Open Fen	Minnesota	15.0	473	14	4	2	
194. Tamarack Bog and Hardwood	Michigan	8.5	294	8	17	6	
195. Bulrush and Cat-tail Marsh in Conifer Forest	Montana	40.5	687	37	61	7	
196. Wet Meadow with Patchy Willows	Oregon	6.0	568	14	13	1	
197. Desert Riparian–Freshwater Marsh and Ponds	California	15.4	966	25	34	5	
198. Restored Coastal Brackish Marsh	California	8.2	584	33	7	2	
P. Fields and Cultivated Areas							
199. Hay Meadow	New York	2.3	434	2	5	1	
200. Old Field Habitat	New Jersey	7.3	785	12	9	2	
201. Abandoned Field I	Pennsylvania	6.0	793	79	18	4	
202. Abandoned Field II	Pennsylvania	4.3	635	45	11	3	
203. Old Field	Pennsylvania	7.1	422	8	15	8	
204. Grassland Municipal Airport	Louisiana	12.1	412	8	5	1	

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs obs.	Species	Yrs of study
205. Subirrigated Grassland	Nebraska	16.2	130	4	6	1
206. Subirrigated Native Hay	Nebraska	16.2	148	4	7	1
207. Wetland Sedge Meadow	Nebraska	16.2	136	5	7	1
Q. Residential						
208. Small Town, Residential and Commercial	New Brunswick	50.5	269	23	16	2
209. Village, Residential	Ohio	14.2	325	70	14	1

1. BIRCH-MAPLE FOREST I. — **Location:** Nova Scotia, Kings Co., 44°50'N, 64°44'W. **Continuity:** New. **Size:** 12.8 ha. = 31.6 acres. **Description of plot:** The dominant canopy trees are White Birch (*Betula papyrifera*), Red Maple (*Acer rubrum*), and Yellow Birch (*B. allegheniensis*). Most prominent in the understory are Red Maple, Am. Beech (*Fagus grandifolia*), Witherod (*Viburnum cassinoides*) and Yellow Birch. The ground cover is primarily Bunchberry (*Cornus canadensis*), Wild Sarsaparilla (*Aralia nudicaulis*), Hay-scented Fern (*Dennstaedtia punctilobula*), and Wood Fern (*Dryopteris spinulosa*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 15 65.6 × 65.6 ft² plots, 507/acre; total basal area 106.4 ft²/acre. Species comprising 90% of the total number of trees, followed by trees/acre, relative density (%), basal area in ft²/acre, and relative dominance (%): White Birch, 214, 42, 44, 100; Red Maple, 139, 27, 31, 100; Yellow Birch, 81, 16, 9, 73; Am. Beech, 26, 5, 2, 53. Trees by diameter size class: A (3-6 in.) 307, 60, 33, 31; B (6-9 in.) 157, 31, 43, 40; C (9-15 in.) 44, 9, 28, 26; D (15-21 in.) 1, 0.2, 3, 3. Shrub stems/acre 4149; ground cover 54%; canopy cover 73%; average canopy height 51.5 ft (range 35-81 ft). **Edge:** Bordered on all sides by similar forest. **Topography:** Essentially flat. **Elevation:** 600 ft. **Weather:** Warm to hot and dry over most of period. **Coverage:** June 1-July 2; between dawn and 12:15 or 19:00-21:30. Total man-hours: 43.4. **Census** (territorial males, followed in parentheses by territorial males per km² and per 100 acres): Least Flycatcher, 25.5 (199, 81); Am. Redstart, 20.5 (160, 65); Ovenbird, 20 (156, 63); Red-eyed Vireo, 15 (117, 47); Black-throated Green Warbler, 9 (70, 28); Black-and-white Warbler, 5 (39, 16); Veery, 4 (31, 13); Hermit Thrush, 3 (23, 9); N. Parula, 3; Solitary Vireo, 2; N. Waterthrush, 2; Black-throated Blue Warbler, 1.5; E. Wood Pewee, 1; Am. Robin, 1; Yellow-rumped Warbler, 1; Com. Yellowthroat, 1; Dark-eyed Junco, 1; Yellow-bellied Flycatcher, 0.5; Tennessee Warbler, 0.5; Chestnut-sided Warbler, 0.5; Rose-breasted Grosbeak, 0.5; White-throated Sparrow, 0.5; Hairy Woodpecker, +; Swainson's Thrush, +; Canada Warbler, +. **Total:** 25 species; 118 territorial males (923/km², 373/acres). **Visitors:** Ruffed Grouse, Black-capped Chickadee, White-breasted Nuthatch, Mourning Warbler. **Remarks:** Nests located (6): Least Flycatcher, 1; Wood Pewee, 1; Hermit Thrush, 1; Black-

and-white Warbler, 1; Ovenbird, 2. This work was funded by research grants from the Canadian Wildlife Service and Dalhousie University, and is part of a larger study investigating the impact of forestry on breeding bird populations—K.H.B. MORGAN, B. FREEDMAN, C. BEAUCHAMP, A. GREENE, and E. GREENE, Dept. of Biol., Dalhousie Univ., Halifax, N.S. B3H 4J1.

2. BIRCH-MAPLE FOREST II. — **Location:** Nova Scotia, Kings Co., 44°50'N, 64°44'W. **Continuity:** New. **Size:** 7.2 ha = 17.8 acres. **Description of Plot:** The dominant canopy trees are White Birch (*Betula papyrifera*), Red Maple (*Acer rubrum*), Yellow Birch (*B. allegheniensis*), Am. Beech (*Fagus grandifolia*) and Sugar Maple (*A. saccharum*). Most prominent in the understory are Am. Beech, Red Maple, Sugar Maple and White Ash (*Fraxinus americana*). The ground cover is primarily Hay-scented Fern (*Dennstaedtia punctilobula*), Wild Sarsaparilla (*Aralia nudicaulis*), Wood Fern (*Dryopteris spinulosa*) and Red Maple. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 8 square 65.6 × 65.6 ft plots, 514/acre; total basal area 122 ft²/acre. Species comprising 90% of the total number of trees: White Birch, 213, 41, 43, 100; Red Maple, 113, 22, 27, 100; Yellow Birch, 64, 13, 7, 75; Am. Beech, 44, 9, 3, 75; and Sugar Maple, 44, 9, 9, 75. Trees by diameter size class: A (3-6 in.) 300, 63, 33, 37; B (6-9 in.) 153, 30, 46, 38; C (9-15 in.) 59, 12, 37, 30; D (15-21 in.) 2, 0.1, 5, 4. Shrub stems/acre 3224; ground cover 34%; canopy cover 79%; average canopy height 56 ft (range 35-81 ft). **Edge:** Bordered on all sides by similar forest. **Topography:** Essentially flat. **Elevation:** 600 ft. **Weather:** Warm to hot and dry over most of period. **Coverage:** June 1-July 2; between dawn and 12:15 or 19:00-21:30. Total man-hours: 22.1. **Census:** Least Flycatcher, 13 (180, 73); Am. Redstart, 10 (139, 56); Ovenbird, 9.5 (132, 53); Red-eyed Vireo, 9 (125, 51); Black-throated Green Warbler, 6 (83, 34); Veery, 2.5; Black-and-white Warbler, 1.5; N. Parula, 1.5; Hermit Thrush, 1; Am. Robin, 0.5; Rose-breasted Grosbeak, 0.5; E. Wood Pewee, +; Swainson's Thrush, +. **Total:** 13 species; 55 territorial males (764/km², 309/100 acres). **Visitors:** Ruffed Grouse, Hairy Woodpecker, Black-capped Chickadee, Chestnut-sided Warbler. **Remarks:** Nests located (3): Wood Pewee;

Black-and-white Warbler; Ovenbird. This work was funded by research grants from the Canadian Wildlife Service and Dalhousie University, and is part of a larger study investigating the impact of forestry on breeding bird populations.—K.H. MORGAN, B. FREEDMAN, C. BEAUCHAMP, A. GREENE, and E. GREENE, Dept. of Biol., Dalhousie Univ., Halifax, N.S., B3H 4J1

3. BIRCH-MAPLE FOREST III. — **Location:** Nova Scotia, Kings Co., 44°50'N, 64°44'W. **Continuity:** New. **Size:** 5.6 ha = 13.8 acres. **Description of Plot:** The dominant canopy trees are White Birch (*Betula papyrifera*), Red Maple (*Acer rubrum*) and Yellow Birch (*B. allegheniensis*). Most prominent in the understory are Witherod (*Viburnum cassinoides*), Red Maple, Rhodora (*Rhododendron canadense*) and Sheep Laurel (*Kalmia angustifolia*). The ground cover is primarily Bunchberry (*Cornus canadensis*), Canada Blueberry (*Vaccinium myrtilloides*), Wild Sarsaparilla (*Aralia nudicaulis*) and Sheep Laurel. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 7 65.6 × 65.6 ft² plots, 474/acre; total basal area 88.6 ft²/acre. Species comprising 90% of the total number of trees: White Birch, 200, 42, 46, 100; Red Maple, 168, 35, 39, 100; Yellow Birch, 86, 18, 12, 71. **Trees by diameter class:** A (3-6 in.) 300, 63, 33, 37; B (6-9 in.) 148, 31, 40, 45; C (9-15 in.) 26, 6, 16, 18. Shrub stems/acre 5136; ground cover 74%; canopy cover 66%; average canopy height 46 ft (range 39-64 ft). **Edge:** Bordered on all sides by similar forest. **Topography:** Essentially flat. **Elevation:** 600 ft. **Weather:** Warm to hot and dry over most of period. **Coverage:** June 1-July 2; between dawn and 12:00 or 19:00-21:30. Total man-hours: 21.3. **Census:** Least Flycatcher, 12.5 (224, 91); Ovenbird, 10.5 (188, 76); Am. Redstart, 10.5; Red-eyed Vireo, 6 (107, 43); Black-and-white Warbler, 3.5 (63, 25); Black-throated Green Warbler, 3 (54, 22); Hermit Thrush, 2; Solitary Vireo, 2; N. Waterthrush, 2; Veery, 1.5; N. Parula, 1.5; Black-throated Blue Warbler, 1.5; E. Wood Pewee, 1; Yellow-rumped Warbler, 1; Com. Yellowthroat, 1; Dark-eyed Junco, 1; Yellow-bellied Flycatcher, 0.5; Am. Robin, 0.5; Tennessee Warbler, 0.5; Chestnut-sided Warbler, 0.5; White-throated Sparrow, 0.5; Hairy Woodpecker, +; Canada Warbler, +. **Total:** 23 species; 63 territorial males (1128/km², 457/100 acres). **Visitors:**

White-breasted Nuthatch, Mourning Warbler, Rose-breasted Grosbeak, Ruffed Grouse. **Remarks:** Nests located (3): Least Flycatcher; Hermit Thrush; Ovenbird. This work was funded by research grants from the Canadian Wildlife Service and Dalhousie University, and is part of a larger study investigating the impact of forestry on breeding bird populations.—*K.H. MORGAN, B. FREEMAN, C. BEAUCHAMP, A. GREENE, and E. GREENE, Dept. of Biol., Dalhousie Univ., Halifax, N.S. B3H 4J1.*

4. 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, 15 intermittent years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AFN 19: 590-591 (1965). **Coverage:** Apr. 9; June 2, 5, 9-11 Total man-hours: 11. **Census:** Ovenbird, 15 (148, 60); Veery, 10 (99, 40); Red-eyed Vireo, 9 (89, 36); Black-capped Chickadee, 5 (49, 20); Black-and-white Warbler, 5; Scarlet Tanager, 5; Chestnut-sided Warbler, 4 (40, 16), Com. Yellowthroat, 4; Com. Flicker, 3 (30, 12); Tufted Titmouse, 3; White-breasted Nuthatch, 2.5; Wood Thrush, 2.5; Rose-breasted Grosbeak, 2.5; Downy Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; Gray Catbird, 2; Blue-gray Gnatcatcher, 2; Brown-headed Cowbird, 2; Cardinal, 2; Com. Crow, 1.5; Wood Duck, 1; Broad-winged Hawk, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Brown Creeper, 1; House Wren, 1; Am. Robin, 1; La Waterthrush, 1; Canada Warbler, 1; Am. Redstart, 1; N. Oriole, 1; Rufous-sided Towhee, 1; Ruffed Grouse, 0.5; Barred Owl, 0.5; E Phoebe, 0.5; Song Sparrow, 0.5. **Total:** 37 species; 100 territorial males (988/km², 400/100 acres). **Remarks:** Density increased by 9.5 males or 10%. Rufous-sided Towhee declined by 6, the single Blue-winged Warbler disappeared, but basically no surprising changes or new species. Gypsy moth caterpillar infestation was significant. Brown-headed Cowbirds more conspicuous than usual.—*ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.*

5. BEECH-MAPLE-BIRCH FOREST. — **Location:** New York; Essex Co., on slope of Gooseberry Mountain; 44°03'N, 74°14'W, Santanoni Quadrangle, USGS. **Continuity:** New **Size:** 20 ha = 49.4 acres (400 × 500 m; complete 50 m, partial 25 m grid). **Description of Plot:** The forest is almost entirely deciduous, unusual for this region of New York. The dominant canopy trees are Am. Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), and Yellow Birch (*Betula alleghaniensis*). Most prominent in the understory are Beech and Sugar Maple. The ground cover is primarily Sugar Maple seedlings and ferns (*Dryopteris* spp.). A quantitative survey of the vegetation gave the following Trees 3 cm diameter and over, based on 52 0.1-acre circular samples, 431/acre; total basal area 159.8 ft²/acre. Species comprising at least 90% of the total number of trees: Am. Beech, 245, 57, 34, 98; Sugar Maple, 60, 14, 37, 98; Yellow Birch, 49, 11, 11, 67; dead trees, 43, 10, 9, 98. Trees by diameter size class S(3-8 cm) 166, 39, 4.3, 3; A(8-15 cm) 98, 23, 9.8, 6; B(15-23 cm) 73, 17, 21.9, 14;

C(23-38 cm) 64, 15, 51, 2, 32, D(38-53 cm) 16, 4, 28.6, 18; E(53-69 cm) 10, 2, 32, 20; F(69-84 cm) 2, 0.5, 10.5, 7; G(84-102 cm) 0.2, 0.04, 1.4, 1. Shrub stems/acre 2670; ground cover 42%; canopy cover 92%; average canopy height 19.6 m (range 3-29 m). **Edge:** Bordered on all sides by similar forest. **Topography:** Moderate slope. **Elevation:** 550-640 m. **Weather:** Temperatures and precipitation normal throughout the period. **Coverage:** June 5-6, 8, 10-12, 18, 25, 30; July 1; between dawn and 1130. Total man-hours: 47. **Census:** Red-eyed Vireo, 34 (170, 69); Am. Redstart, 24 (120, 49); Least Flycatcher, 11.5 (58, 23); Black-throated Blue Warbler, 10 (50, 20); Ovenbird, 6 (30, 12); Black-throated Green Warbler, 5 (25, 10); Veery, 4.5 (23, 9); Scarlet Tanager, 3 (15, 6); Yellow-bellied Sapsucker, 2; Rose-breasted Grosbeak, 2; Ruffed Grouse, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; Olive-sided Flycatcher, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Winter Wren, 1; Wood Thrush, 1; Black-and-white Warbler, 1; Blackburnian Warbler, 1; Downy Woodpecker, 0.5. **Total:** 21 species; 112.5 territorial males (563/km², 228/100 acres). **Visitors:** Broad-winged Hawk, Ruby-throated Hummingbird, Pileated Woodpecker, Blue Jay, Brown Creeper, Am. Robin, Hermit Thrush, Swainson's Thrush, Cedar Waxwing, Solitary Vireo, Chestnut-sided Warbler, Canada Warbler, White-throated Sparrow. **Remarks:** Nests found: Yellow-bellied Sapsucker, Hairy Woodpecker, Downy Woodpecker, Red-eyed Vireo, Scarlet Tanager. This study was conducted at the Adirondack Ecological Center, SUNY College of Environmental Science and Forestry, Newcomb, NY.—*SAM DROEGE, BARRY R. NOON, ROBIN A. BINGHAM, and DEANNA K. DAWSON, Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, MD 20708.*

6. BEECH-MAPLE FOREST. — **Location:** New York; Monroe Co., North Chili, 43°08'N, 77°48'W. **Continuity:** New. **Size:** 6.52 = 16.1 acres (rectangular, 975 × 720 ft, E boundary irregular in shape, paced with compass). **Description of Plot:** Canopy varied from largely closed to semi-open. Species composition: 60% Am. Beech (*Fagus grandifolia*), 20% Red Maple (*Acer rubrum*), 10% Sugar Maple (*A. saccharum*), 10% other species. Beech and Sugar Maple dominated drier portions while Red Maple was common on wet sites. Herbaceous ground cover and understory saplings were relatively sparse in the beech stands but thick in Red Maple stands. Stems of mature trees were up to 60 ft tall, averaged 1 ft dbh, and averaged about 30 ft apart. The NW corner contained a portion of a shrubby glade with Reed Canary Grass (*Phalaris arundinacea*). **Edge:** Tract bounded on the S, N, and W by similar forest, and on the E by a woodland composed of young, dense Burr Oak (*Quercus macrocarpa*), Red Maple, and elm (*Ulmus* sp.). A shrubby glade abuts the NW corner, and shrubby fields run parallel to and about 100 ft out from the S boundary. **Topography:** Basically flat but the S half is higher and drier than the N half. Standing water was not present during most of the study period. **Coverage:** June 3, 15, 18, 24, 28; July 4; 0545-0715,

EDT Total man-hours 7 **Census:** Wood Thrush, 6.5 (100, 40); Red-eyed Vireo, 5 (77, 31); E. Wood Pewee, 3 (46, 19); Downy Woodpecker, 2; House Wren, 2; Cardinal, 1.5; Red-tailed Hawk, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Veery, 1; N. Oriole, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Starling, 0.5. **Total:** 19 species; 32.5 territorial males (499/km², 202/100 acres) **Visitors:** Am. Kestrel, Mourning Dove, Brown Creeper, Am. Robin, Cedar Waxwing, House Sparrow, Com. Grackle, Brown-headed Cowbird. **Remarks:** Wood Thrush, Red-eyed Vireo, and E. Wood Pewee territories were distributed throughout the plot. The single Red-tailed Hawk, Great Crested Flycatcher, White-breasted Nuthatch, and Scarlet Tanager males apparently each utilized most or all of the plot. The Veery was largely limited to one of the wetter portions of the plot with many fallen trees. The Brown Creeper was singing but observed only once.—*LYNN BRABAND, Rochester, New York.*

7. YOUNG MIXED FOREST. — **Location:** New York; St. Lawrence Co., 0.25 mi E of Howardville Rd., 0.25 mi SW of Rte 68, 44°33'N, 75°03'W, Pierrepont Quadrangle, USGS. **Continuity:** Established 1976; 5 intermittent years. **Size:** 4.4 ha = 10.9 acres **Description of Plot:** See AB 32: 74 (1978) **Weather:** Warm and dry from May 12 to June 22; mean min. daily temp. 49.2°F (9.6°C), mean max. daily temp. 70.1°F (21.2°C); total precipitation 4.56 in. (11.7 cm). **Coverage:** May 1, 17, 23-24, 27; June 3, 5, 15, 28; 0450-0800, EST. Total man-hours: 8. **Census:** Nashville Warbler, 4 (91, 37); Field Sparrow, 2; White-throated Sparrow, 2; Black-capped Chickadee, 1.5; Black-and-white Warbler, 1.5; Com. Yellowthroat, 1.5; Rufous-sided Towhee, 1.5; Song Sparrow, 1.5; Ruffed Grouse, 1; Gray Catbird, 1; Am. Robin, 1, Wood Thrush, 1; Veery, 1; Red-eyed Vireo, 1; Golden-winged Warbler, 1; Chestnut-sided Warbler, 1; Ovenbird 1; Rose-breasted Grosbeak, 1; Mourning Dove, 0.5; Black-billed Cuckoo, +; Whip-poor-will, +; Com. Flicker, +; Great Crested Flycatcher, +; Blue Jay, +; Yellow Warbler, +; N. Oriole, +; Brown-headed Cowbird, +. **Total:** 27 species; 26 territorial males (589/km², 239/100 acres). **Visitors:** Am. Kestrel, Com. Crow, Am. Goldfinch. **Remarks:** Nests located: Mourning Dove, Am. Robin, Song Sparrow.—*KENNETH L. CROWELL, Dept. of Biol., St. Lawrence Univ., Canton, NY 13617.*

8. YOUNG RED MAPLE-GRAY BIRCH FOREST. — **Location:** New York; St. Lawrence Co., 4 mil NE of Waddington at Coles Creek, 44°53'N, 75°07'W, Louisville Quadrangle, USGS. **Continuity:** Established 1976, 6 consecutive years. **Size:** 8.1 ha = 20 acres **Description of Plot:** See AB 31: 31 (1977) **Weather:** A wet season. **Coverage:** June 1-2, 4, 7, 10, 13, 16, 18, 22; July 1; 0440-2100, EDT. Total man-hours: 14. **Census:** Veery, 17 (210, 85); Am. Redstart, 6 (74, 30); Yellow Warbler, 5 (62, 25); N. Oriole, 5; Am. Robin, 4 (49, 20); Com. Yellowthroat, 4; Com. Flick-

er, 3 (37, 15), Gray Catbird, 3, Red-eyed Vireo, 3; Warbling Vireo, 3; Com. Grackle, 3, Rose-breasted Grosbeak, 3; Song Sparrow, 3; Least Flycatcher, 2; Cedar Waxwing, 2, Ovenbird, 2; Red-winged Blackbird, 2; White-throated Sparrow, 2; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1, Black-capped Chickadee, 1; Wood Thrush, 1; Black-and-white Warbler, 1; Nashville Warbler, 1; Purple Finch, 1; Swamp Sparrow, 1; Green-winged Teal, +; Hairy Woodpecker, +; Downy Woodpecker, +; N. Waterthrush, +. **Total:** 31 species; 81 territorial males ($1001/\text{km}^2$, 405/100 acres). **Visitors:** Com. Loon, Great Blue Heron, Mallard x Black Duck, Am. Wigeon, Broad-winged Hawk, Killdeer, Ring-billed Gull, Chimney Swift, Belted Kingfisher, E. Kingbird, Alder Flycatcher, Barn Swallow, Purple Martin, Com. Crow, House Wren, Brown Thrasher, Starling, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** Along with rain, the water level in this area was raised by the Moses Saunders Dam in the St. Lawrence River, 18 mi to the E.—J. VAN RIET, 26 Williams St., Massena NY 13662.

9. MATURE DECIDUOUS FLOODPLAIN FOREST.—**Location:** Maryland; Montgomery Co., Glen Echo, 2.5 mi NW of the District of Columbia, between the C. & O. Canal and the Potomac River, $38^\circ58'N$, $77^\circ30'W$, Falls Church Quadrangle, USGS. **Continuity:** Established 1947; 31 intermittent years. **Size:** 7.6 ha = 18.75 acres. **Description of Plot:** See AFN 1: 212-213 (1947). **Weather:** Average temperature was 65°F . Weather was generally fair with no extreme storm or flood conditions. **Coverage:** Apr. 4, 11, 25; May 3, 9, 24-25; June 6, 13, 21; July 5; 0500-1300, EST. Total man-hours: 27. **Census:** Starling, 10 (132, 53); Cardinal, 4 (53, 21); Red-eyed Vireo, 4; Downy Woodpecker, 3 (40, 16); Acadian Flycatcher, 3; Carolina Chickadee, 3, Tufted Titmouse, 3; Blue-gray Gnatcatcher, 3; Great Crested Flycatcher, 2; Red-bellied Woodpecker, 2; Carolina Wren, 2; N. Parula, 2; Brown-headed Cowbird, 2; Prothonotary Warbler, 1.5; Mallard, 1; Wood Duck, 1; Barred Owl, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Veery, 1; Warbling Vireo, 1; Yellow-throated Warbler, 1; Am. Redstart, 1; N. Oriole, 1; Song Sparrow, 1. **Total:** 30 species; 60.5 territorial males or females ($797/\text{km}^2$, 323/100 acres). **Visitors:** Yellow Warbler, Com. Yellowthroat, Indigo Bunting. **Remarks:** Nests located: Starling, 10; 1 each for Mallard, Pileated Woodpecker, Carolina Chickadee, Tufted Titmouse, Brown Creeper, Cardinal. The totals for species and territories are higher than last year (30 as compared with 26 and 60.5 as compared with 49.5 in 1980). The increase in species was caused by the appearance of Mallard, Hairy Woodpecker and Ruby-throated Hummingbird and by the Veery which had not nested since 1973. Although total territories increased in 1981, this did not involve any significant changes in the downward trend of the Acadian Flycatcher, Red-eyed Vireo, N. Parula, or Am. Redstart. As

mentioned in 1980 and previous reports this seems to be a part of a decrease in forest-nesting neo-tropical migrants which has also occurred in other long-term censuses.—J.R. GAUTHEY, JOAN H. CRISWELL (compiler), 3519 Jermantown Road, Fairfax, VA 22030.

10. MIXED HARDWOOD FOREST. —

Location: Maryland; Calvert Co., NW of Plum Point and one mi inland from Chesapeake Bay on Tobacco Road between Routes 263 and 261. **Continuity:** Established 1960; 17 intermittent years. **Size:** 11.3 ha = 28 acres. **Description of Plot:** See AFN 13: 333 (1959). **Weather:** Except for 3, the counts were made on clear days, and high temperatures varied between 60 - 90°F . The creek flowed and the low area was wet until the last trip when both were dry. **Coverage:** Apr. 27, 30; May 2, 9, 16, 23, 26; June 4, 7, 18, 24, 29. The 12 trips averaged 82 minutes and started between 0555-1036. **Census:** Red-eyed Vireo, 15 (132, 54); Hooded Warbler, 12 (106, 43); Rufous-sided Towhee, 9 (79, 32); White-eyed Vireo, 8 (71, 29); Com. Yellowthroat, 6 (53, 21); Wood Thrush, 5 (44, 18); Yellow-breasted Chat, 5; Cardinal, 5; Mourning Dove, 4 (35, 14); Tufted Titmouse, 4; Kentucky Warbler, 4; Indigo Bunting, 4; Carolina Wren, 3 (26, 11); Ovenbird, 3; Scarlet Tanager, 3; Bobwhite, 2; Red-bellied Woodpecker, 2; Acadian Flycatcher, 2; Pine Warbler, 2; Am. Woodcock, 1; Blue Jay, 1; E. Wood Pewee, 1; Carolina Chickadee, 1; Louisiana Waterthrush, 1; Summer Tanager, 1; Green Heron, +; Red-tailed Hawk, +; Red-shouldered Hawk, +; Com. Flicker, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Downy Woodpecker, +; E. Kingbird, +; Great Crested Flycatcher, +; Com. Crow, +; Gray Catbird, +; Brown Thrasher, +; Blue-gray Gnatcatcher, +; Yellow-throated Vireo, +; N. Parula, +; Prairie Warbler, +; Am. Redstart, +; Com. Grackle, +; Brown-headed Cowbird, +; Field Sparrow, +. **Total:** 45 species; 104 territorial males ($918/\text{km}^2$, 371/100 acres).

Remarks: The 25 species considered to be on territory (1 or more pairs) this year were the lowest yet recorded. In contrast, the total of 20 visitors was the greatest yet recorded. Last year's 29 species were the lowest up to that time. The 21-year average of 35 remains unchanged from last year. However, the territorial males increased from last year's all-time low of 89 to 104. The 21-year average showed a further drop from 210 last year to 205. The 5 most numerous species were the same as last year. The Red-eyed Vireo was again first and increased by one territory. The Hooded Warbler was second for the first time, and its territories showed a marked increase from 6 to 12, which matched the average of the first 10 years. This species has increased well after a low of 2 territories in 1975. The White-eyed Vireo rose from 5 to 8 territories, the highest ever for this species; and it was fourth in number of territories. There were no notable losses.—JOHN H. FALES, 2809 Ridge Road, Neeld Estate, Huntingtown, Md. 20639.

11. MIXED UPLAND HABITAT. —

Location: District of Columbia, the central third of Glover-Archbold Park, $38^\circ55'N$, $77^\circ05'W$, Washington W Quadrangle, DC-MD-VA, 7.5

min. series USGS. **Continuity:** Established 1959; 22 consecutive years. **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AFN 14 502-503 (1960). **Weather:** Temperature 50 - 85°F , average 70° . On the 13 trips; 8 were clear, 5 partly cloudy, with wind calm on 9, 7-10 mph on the other 3. **Coverage:** Apr. 11, 26, May 3, 16-17, 24; June 7, 19, 21, 28-29, from 0840-2100. Total man-hours 25.5. **Census:** Veery, 23 (162, 66); Cardinal, 17 (120, 49); Gray Catbird, 13 (92, 37); Carolina Chickadee, 11 (78, 31); Blue Jay, 8 (56, 23); Tufted Titmouse, 8; Carolina Wren, 6 (42, 17); Wood Thrush, 5.5 (39, 16); Red-bellied Woodpecker, 3 (21, 9); Com. Crow, 3; Am Robin, 3; Red-eyed Vireo, 3; Rufous-sided Towhee, 3; Downy Woodpecker, 2; Screech Owl, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Mockingbird, 1; Starling, 1; Rock Dove, +; E. Wood Pewee, +; White-breasted Nuthatch, +; Ovenbird, +; House Sparrow, +; Com. Grackle, +. **Total:** 25 species; 113.5 territorial males ($801/\text{km}^2$, 324/100 acres). **Visitors:** Chimney Swift, Great Crested Flycatcher, House Wren, Am Redstart, N. Oriole, Am. Goldfinch, Song Sparrow. **Remarks:** Coverage was next to the lowest in the 23 years of the census, and while numbers of common, conspicuous birds remain about the same as in recent years, number of species is down, and some listed as visitors might have proved to be territorial with 1 or 2 more observations. No changes in weather or the area and its surroundings occurred to explain a down trend. The largest drop was in towhees, from 11 to 3, but they tend to go up and down that much from year to year. Two nest holes were noted, for Carolina Chickadee and Com Flicker. Both Red-bellied and Downy Woodpeckers were down; in the past 5 years, Red-bellies have had 7, 7, 6.5, 6.5, to 3 territories, and Downies from the former 6 level; 6, 3 5, 3, 3, 2. It cannot be from competition with Starlings, since these continue their decline from 25 in 1970 to 1 now.—SHIRLEY A BRIGGS (compiler), OLIVE HOLBROOK, GT. and SUSAN HUNT, 7605 Honeywell Lane, Bethesda, MD 20814.

12. BEECH-CHERRY-BASSWOOD. —

Location: West Virginia; Pocahontas Co., 10 mil NW of Marlinton; $38^\circ18'47''N$, $80^\circ12'56''W$, Woodrow Quadrangle, USGS. **Continuity:** New. **Size:** 607 ha = 15 acres (rectangular 110×660 yds, length measured, width estimated). **Description of Plot:** The dominant canopy trees are Am. Beech (*Fagus grandifolia*), Black Cherry (*Prunus serotina*) and Am. Basswood (*Tilia americana*). Prominent in the understory are Striped Maple (*Acer pensylvanicum*) and seedlings of the canopy species. The ground cover is primarily Wood Nettle (*Laportea canadensis*), Blue Cohosh (*Caulophyllum thalictroides*) and many species of ferns. The vegetation consists of: Trees 3 in. diameter and over 283/acre; total basal area 179 ft²/acre. Species comprising 97% of the total number of trees: Am. Beech, 45, 16, 27 7, 100; Black Cherry, 25, 9, 20.0, 75; Am Basswood, 40, 14, 18.3, 75; Sugar Maple (*A. saccharum*), 42, 15, 10.9, 100; Sweet Buckeye (*Aesculus octandra*), 15, 5, 6.3, 100; Cucumber (*Magnolia acuminata*), 20, 7, 5, 5 50; Yellow Birch (*Betula lutea*), 28, 10, 3 5, 50; Red Maple (*A. rubrum*), 25, 9, 2 2, 75

Trees by diameter size class A (3-6 in.) 127, 45, 12, 7, 7; B (6-9 in.) 37, 13, 2, 15, 5, 8, 7; C (9-15 in.) 77, 27, 4, 59, 5, 33, 3; D (15-21 in.) 27, 9, 7, 49, 5, 27, 8; E (21-27) 12, 3, 5, 31, 17, 4; F (27-33) 2, 5, 1, 10, 5, 3. **Shrub stems/acre** 7200, ground cover 57%; canopy cover 70% average canopy height 82 ft (range 77-88). **Edge:** Bordered on all sides by similar forest. **Topography:** Centerline follows a logging access road. **Elevation:** 3400 to 3600 ft. on the E-facing side of Black Mountain. **Coverage:** June 11-14; between dawn and 0800 or 1800-2000. Total man-hours: 8. **Census:** Black-throated Green Warbler, 6 (99, 40); Black-throated Blue Warbler, 5 (82, 33); Red-eyed Vireo, 4 (66, 27), Wood Thrush, 2; Veery, 2; Dark-eyed Junco, 2; Solitary Vireo, 1; Scarlet Tanager, 0.5; Blue Jay, +; White-breasted Nuthatch, +. **Total:** 10 species; 22.5 territorial males or females ($370/\text{km}^2$, 150/100 acres). **Remarks:** This study is an area of mature timber inside an extensive forest of similar habitat. The variety and number of species are a verification of the homogeneity of the plot and the maturity of the forest.—*BROOKS BIRD CLUB, 707 Warwood Avenue, Wheeling, WV 26003.*

13. BLACK CHERRY-RED MAPLE FOREST. — **Location:** West Virginia; Pocahontas Co.; 4 mi W of Edray; $38^\circ 18' 37''\text{N}$; $80^\circ 11' 08''\text{W}$, Edray Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds measured longitudinally and estimated laterally). **Description of Plot:** A forested section of the Handley Public Hunting Area near the camping ground. The dominant canopy trees are Black Cherry (*Prunus serotina*) and Red Maple (*Acer rubrum*). Most prominent in the understory are: Witch Hazel (*Hamamelis virginiana*), Serviceberry (*Amelanchier laevis*) and saplings of canopy trees. The ground cover: Hay-scented and New York ferns and violets (*Viola* sp.). Results of the quantitative survey of vegetation: Trees 3 in. diameter and over based on six 0.1 acre circular samples, 402/acre; total basal area $159 \text{ ft}^2/\text{acre}$. Species comprising 96% of the total number of trees: Black Cherry, 83, 21, 37, 83, Red Maple, 200, 50, 37, 50; Yellow Birch (*Betula lutea*), 25, 6, 4.0, 50; Black Birch (*B. lenta*), 7, 2, 5, 50; Am. Beech (*Fagus americana*), 22, 5, 3, 50; Quaking Aspen (*Populus tremuloides*) 15, 4, 5, 33; Hemlock (*Tsuga canadensis*), 12, 3, 4, 50. Trees by diameter size class: A (3-6 in.) 168, 42, 17, 11; B (6-9 in.) 135, 34, 41, 26; C (9-15 in.) 85, 21, 68, 43; D (15-21 in.) 7, 2, 18, 11; E (21-27 in.) 7, 2, 16, 10. Shrub stems/acre: 3417, ground cover 65%; canopy cover 90%; average canopy height 60 ft (range 50-71 ft). **Edge:** Bordered on all sides by similar habitat. **Topography:** Fairly level, extending NE from 3160-3200 ft. **Weather:** Clear with some fog and intermittent light rain. **Coverage:** June 10-14, between dawn and 0830 plus 2 mid-morning and 2 evening trips. Total man-hours: 8.5. **Census:** Black-throated Green Warbler, 4 (66, 27); Ovenbird, 4; Red-eyed Vireo, 3 (49, 20); Hermit Thrush, 2; Black-throated Blue Warbler, 2; Magnolia Warbler, 1.5; Solitary Vireo, 1; Veery, +; Scarlet Tanager, +. **Total:** 9 species; 17.5 territorial males ($288/\text{km}^2$, 117/100 acres). **Visitors:** Pileated Woodpecker, Com. Crow,

Brown-headed Cowbird, Am Goldfinch. **Remarks:** The age of the trees in the plot appeared to be between 50-60 years old, a take-over of former grazing land presumed by the presence of old fencing.—*K. ANDERSON, E.D. CHANDLER, G. HURLEY, G. KOCH, N. LAITSCH, B. SMITH and E.R. CHANDLER (compiler), Brooks Bird Club, 707 Warwood Avenue, Wheeling, WV 26003.*

14. MAPLE-BEECH-BIRCH FOREST. — **Location:** West Virginia; Pocahontas Co.; in the Handley State Hunting and Fishing Area, 8 mi NW from Marlinton; $38^\circ 18' 54''\text{N}$, $80^\circ 11' 24''\text{W}$, Woodrow Quadrangle, USGS. Extends NE. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, length measured, width estimated). **Description of Plot:** A mature forest last cut about 1935. The dominant trees are Sugar Maple (*Acer saccharum*) and Am. Beech (*Fagus grandifolia*). Prominent in the understory are Striped Maple (*A. pensylvanicum*), Spicebush (*Lindera benzoin*), and seedlings of the canopy species. The varied ground cover includes Canada Mayflower (*Maianthemum canadense*), Mountain Wood Sorrel (*Oxalis montana*), violets (*Viola* sp.), ferns and *Lycopodium* sp. The results of a vegetation survey are: Trees 3 in. dia. and over 207/acre; total basal area $94 \text{ ft}^2/\text{acre}$. Species comprising 98% of the total number of trees; Red Oak (*Quercus rubra*), 28, 14, 33, 100; White Oak (*Q. alba*), 48, 23, 32, 83; Sugar Maple, 69, 33, 16, 100, Flowering Dogwood (*Cornus florida*), 45, 22, 8, 83; Pignut Hickory (*Carya glabra*), 12, 5, 11, 50. Trees by diameter size class: A (3-6 in.) 118, 56, 12, 13; B (6-9 in.) 52, 25, 15, 16, C (9-15 in.) 17, 8, 13, 14; D (15-21 in.) 15, 7, 27, 29; E (21-27 in.) 3, 2, 10, 11; F (27-33 in.) 3, 2, 16, 17. Shrub stems 5300/acre; ground cover 31%; canopy cover 78%; average canopy height 75 ft (range 58-93). **Edge:** Forest continues on all sides. **Topography:** The centerline trial follows a narrow ridge at elevation 2700 ft. The sides are from 10-50 ft lower than the centerline. **Weather:** Generally foggy with rain during the early part of the week; warm and sunny for the last 2 days. **Coverage:** May 30-June 3; between dawn and 0800, plus 4 mid-morning trips and 2 evening trips (13 trips). Total party-hours: 9. **Census:** Red-eyed Vireo, 6 (99, 40); Cerulean Warbler, 4 (66, 27); Wood Thrush, 4; Ovenbird, 3 (49, 20); Scarlet Tanager, 2; Black-throated Green Warbler, 2; Black-and-white Warbler, 1.5; E. Wood Pewee, 1; Am. Redstart, 1, Great Crested Flycatcher, 1; Red-bellied Woodpecker, +; Tufted Titmouse, +, Brown-headed Cowbird +. **Total:** 13 species; 25.5 territorial males ($420/\text{km}^2$, 170/100 acres). **Visitors:** Ruffed Grouse, Yellow-billed Cuckoo, Pileated Woodpecker, Downy Woodpecker, Blue Jay, Cedar Waxwing, Black-capped Chickadee, Solitary Vireo, Yellow-throated Vireo, Rose-breasted Grosbeak.—*G.F. HURLEY, M KIFF, E. and W. THOMPSON, C. CONRAD, L. HARPER, D. NEMANICH, E ZIMMERMAN, and K.H. ANDERSON (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.*

15. OAK-MAPLE-HICKORY FOREST. — **Location:** West Virginia; Greenbrier Co.; 3 mi NE from Anthony; $32^\circ 54' 58''\text{N}$, $80^\circ 17' 29''\text{W}$, Anthony Quadrangle, USGS. **Continuity:** Established 1971; 2 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 25: 973 (1971). Previously published under name of maturing oak-hickory forest. The dominant canopy trees are Red Oak (*Quercus rubra*) and Pignut Hickory (*Carya glabra*). Most prominent in the understory are Dogwood (*Cornus florida*) and Redbud (*Cercis canadensis*). The ground cover is primarily Black Cohosh (*Cimicifuga racemosa*) and Sarsaparilla (*Aralia nudicaulis*). A quantitative survey of the vegetation gave the following results: Trees 3-in

lished 1966, 3 intermittent years. See AFN 20: 613-614 (1966) and 25: 974 (1971). **Size:** 6.07 ha = 15 acres. **Description of Plot:** A mature forest from which considerable oak and hickory was removed in the late sixties and early seventies. The new growth is primarily Sugar Maple (*Acer saccharum*) although oaks still predominate. Prominent in the understory are *Sassafras albidum*, Sourwood (*Oxydendrum arboreum*), *Vaccinium* sp., and seedlings of the canopy species. The ground cover is primarily Hairy Disporum (*Disporum lanuginosum*), Black Cohosh (*Cimicifuga racemosa*), and several ferns. The results of a vegetation survey are: Trees 3-in. dia. and over 207/acre; total basal area $94 \text{ ft}^2/\text{acre}$. Species comprising 98% of the total number of trees; Red Oak (*Quercus rubra*), 28, 14, 33, 100; White Oak (*Q. alba*), 48, 23, 32, 83; Sugar Maple, 69, 33, 16, 100, Flowering Dogwood (*Cornus florida*), 45, 22, 8, 83; Pignut Hickory (*Carya glabra*), 12, 5, 11, 50. Trees by diameter size class: A (3-6 in.) 118, 56, 12, 13; B (6-9 in.) 52, 25, 15, 16, C (9-15 in.) 17, 8, 13, 14; D (15-21 in.) 15, 7, 27, 29; E (21-27 in.) 3, 2, 10, 11; F (27-33 in.) 3, 2, 16, 17. Shrub stems 5300/acre; ground cover 31%; canopy cover 78%; average canopy height 75 ft (range 58-93). **Edge:** Forest continues on all sides. **Topography:** The centerline trial follows a narrow ridge at elevation 2700 ft. The sides are from 10-50 ft lower than the centerline. **Weather:** Generally foggy with rain during the early part of the week; warm and sunny for the last 2 days. **Coverage:** May 30-June 3; between dawn and 0800, plus 4 mid-morning trips and 2 evening trips (13 trips). Total party-hours: 9. **Census:** Red-eyed Vireo, 6 (99, 40); Cerulean Warbler, 4 (66, 27); Wood Thrush, 4; Ovenbird, 3 (49, 20); Scarlet Tanager, 2; Black-throated Green Warbler, 2; Black-and-white Warbler, 1.5; E. Wood Pewee, 1; Am. Redstart, 1, Great Crested Flycatcher, 1; Red-bellied Woodpecker, +; Tufted Titmouse, +, Brown-headed Cowbird +. **Total:** 13 species; 25.5 territorial males ($420/\text{km}^2$, 170/100 acres). **Visitors:** Ruffed Grouse, Yellow-billed Cuckoo, Pileated Woodpecker, Downy Woodpecker, Blue Jay, Cedar Waxwing, Black-capped Chickadee, Solitary Vireo, Yellow-throated Vireo, Rose-breasted Grosbeak.—*G.F. HURLEY, M KIFF, E. and W. THOMPSON, C. CONRAD, L. HARPER, D. NEMANICH, E ZIMMERMAN, and K.H. ANDERSON (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.*

16. RED OAK-HICKORY FOREST. — **Location:** West Virginia; Greenbrier Co.; 3 mi NE from Anthony; $32^\circ 54' 58''\text{N}$, $80^\circ 17' 29''\text{W}$, Anthony Quadrangle, USGS. **Continuity:** Established 1971; 2 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 25: 973 (1971). Previously published under name of maturing oak-hickory forest. The dominant canopy trees are Red Oak (*Quercus rubra*) and Pignut Hickory (*Carya glabra*). Most prominent in the understory are Dogwood (*Cornus florida*) and Redbud (*Cercis canadensis*). The ground cover is primarily Black Cohosh (*Cimicifuga racemosa*) and Sarsaparilla (*Aralia nudicaulis*). A quantitative survey of the vegetation gave the following results: Trees 3-in

diameter and over, based on 6 circular samples, 257/acre; total basal area 107 ft²/acre. Species comprising 92.37% of the total number of trees: Red Oak, 23, 9, 27, 83; Pignut Hickory, 43, 17, 19, 66; Red Maple (*Acer rubrum*), 43, 17, 7, 50; dead trees, 18, 11, 7, 83; Black Oak (*Q. velutina*), 15, 6, 7, 50; White Oak (*Q. alba*), 19, 7, 7, 33; Mockernut Hickory (*Carya alba*), 20, 8, 6, 83; Black Locust (*Robinia pseudo-acacia*), 8, 3, 4, 66; Black Walnut (*Juglans nigra*), 10, 4, 4, 33; Chestnut Oak (*Q. prinus*), 7, 3, 4, 33. Trees by diameter size class: A (3-6 in.) 123, 48, 12.3, 11.4; B (6-9 in.) 77, 29.6, 23.0, 21.3; C (9-15 in.) 40, 15.4, 32, 29.7; D (15-21 in.) 15, 5.8, 27, 25; E (21-27 in.) 1.6, .6, 5, 4.8; F (27-33 in.) 1.7, .6, 8, 7.6. Shrub stems/acre 5200; ground cover 31%; canopy cover 77%; average canopy height 69 ft (range 50-83). **Edge:** Surrounded by similar habitat. **Topography:** The center line is a trail which follows a ridge crest in a NE direction and sides slope away. **Elevation:** 2700 ft. **Weather:** Rain every day. **Coverage:** May 29 to June 4; between dawn and 0700 and 1030-1130. Total party-hours: 10.3. **Census:** Red-eyed Vireo, 8 (132, 53); Indigo Bunting, 4 (66, 27); Cerulean Warbler, 4; Tufted Titmouse, 2; Wood Thrush, 2; Blue-gray Gnatcatcher, 2; Ovenbird, 2; Scarlet Tanager, 1; Black-throated Green Warbler, 1; Blackburnian Warbler, 1; Hooded Warbler, 1; Yellow-throated Vireo, 0.75, Downy Woodpecker, 0.5; E. Wood Pewee, 0.5; Black-and-white Warbler, 0.5; Barred Owl, +; Whip-poor-will, +; Great Crested Flycatcher, +; Com. Raven, +; Brown-headed Cowbird, +. **Total:** 20 species; 30.25 territorial males (498/km², 187/100 acres). **Visitors:** Ruby-throated Hummingbird, Red-bellied Woodpecker, White-breasted Nuthatch, Worm-eating Warbler, Am. Redstart, Rose-breasted Grosbeak, Rufous-sided Towhee. **Remarks:** Special thanks to Glen Phillips for his help on all phases of this project.—*B. ATHEY, K. BUSH, D. CAPERTON* (compiler), *E. HUTTON, H. HOOKER, J. JONES, M. WITT, Brooks Bird Club, 707 Warwood Avenue, Wheeling, W Va. 26003.*

17. RED OAK-RED MAPLE.—**Location:** West Virginia; Greenbrier Co. 3.25 mi N of Bluebend Recreation Area; 37°57'01"N, 80°15'28"W, Anthony Quadrangle, USGS. **Continuity:** Established 1966; 3 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Published as Cut-over Oak-hickory Forest in AFN 20:656-657 (1966) and AB 25:999-1000 (1971). The dominant canopy trees are Red Oak (*Quercus rubra*) and Red Maple (*Acer rubrum*). Most prominent in the understory are Spicebush (*Lindera benzoin*) and Hazelnut (*Corylus americana*). The ground cover is primarily ferns and Black Cohosh (*Cimicifuga racemosa*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 176/acre; total basal area 68.2 ft²/acre. Species comprising 90% of the total number of trees: Red Oak 25, 14.1, 51, 100; Red Maple 58, 32.9, 19.2, 100; White Oak (*Q. alba*), 15, 8.5, 10.5, 33; Chestnut Oak (*Q. montana*), 5, 2.8, 5.9, 16; Cucumbertree (*Magnolia acuminata*), 15, 8.5, 2.2, 50; Yellow Oak (*Q. muehlenbergii*), 2, 9, 2, 16. Trees by diameter size class: A (3-

6 in) 115, 65, 11.5, 16.8, B (6-9 in) 25, 14, 7.5, 10.9; C (9-15 in.) 28, 16, 226, 32; D (15-21 in.) 1.6, .9, 3, 4.4; E (21-27 in.) 5, 2.8, 15.5, 22.6; F (27-33 in.) 1.6, .9, 8.2, 11.9. Shrub stems/acre 3733; ground cover 68%; canopy cover 77%; average canopy height 67 ft (range 32-103). **Edge:** Similar habitat continues on all boundaries. Elevation: 3150 ft. **Weather:** Damp with morning fogs and seasonable temperatures. **Coverage:** May 30-June 3; between dawn and 1100 hours or 1800-2000 hours. Total party-hours: 7. **Census:** Red-eyed Vireo, 5 (82, 33); Chestnut-sided Warbler, 3 (49, 20); Acadian Flycatcher, 2; Least Flycatcher, 2; Black-and-white Warbler, 2; Hooded Warbler, 2; Am. Redstart, 2; Scarlet Tanager, 2; Gray Catbird, 1; Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Worm-eating Warbler, 1; Golden-winged Warbler, 1; Cerulean Warbler, 1; Ovenbird, 1; Indigo Bunting, 1; Yellow-billed Cuckoo, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Great Crested Flycatcher, +; E. Wood Pewee, +; Black-capped Chickadee, +; Tufted Titmouse, +; White-breasted Nuthatch, +; Black-throated Green Warbler, +; Brown-headed Cowbird, +; Cardinal, +; Rufous-sided Towhee, +. **Total:** 26 species; 28 territorial males (461/km², 187/100 acres). **Remarks:** This study shows the trend in numbers of bird species as the area reverts from a cut-over brushy area to a mature forest. For example, blackberries are gone because of the shade caused by the canopy of the growing trees. The change in habitat is correlated with the decrease in Chestnut-sided Warblers: 17 in 1966; 10 in 1971; 3 in 1981. A corresponding increase was observed for mature forest birds: Red-eyed Vireo 1.5 in 1966; 3 in 1971; 5 in 1981. Weather may have been a factor in the relative paucity of birds in the plot; the nearest weather station (6 mi) recorded 2.3 in. of rain for the 2 days that preceded the census. Additionally, 3 out of 4 days during the census another 1 inch was recorded. The ground was saturated; vegetation was continually wet; each morning was foggy.—*E. HUTTON, K. BUSH, M. THACKER, H. and M. HOOKER, W. SMITH* (compiler), *Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.*

18. WHITE OAK-HICKORY FOREST.—**Location:** West Virginia; Greenbrier Co., 0.9 mi off Anthony Creek Rd. on Big Draft Rd., begins 600 ft S of Big Draft Rd.; 37°53'58"N, 80°15'13"W, Anthony Quadrangle, USGS. **Continuity:** Established 1966; 3 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Published as Pole-sized Oak Woods, see AFN 20:614 (1966), and AB 25:974 (1971). The dominant canopy trees are White Oak (*Quercus alba*) and hickory (*Carya* sp.). Most prominent in the understory are seedlings of canopy trees, Witch Hazel (*Hamamelis virginiana*) and Maple-leaved Viburnum (*Viburnum acerifolium*). The ground cover is primarily *Vaccinium* sp. and Black Cohosh (*Cimicifuga racemosa*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 291/acre; total basal area 98.9 ft²/acre. Species comprising 90% of the total number of trees: White Oak, 110, 38, 38.4, 83; Hickory, 35, 12, 12.8, 67;

Red Maple (*Acer rubrum*), 47, 16.2, 9.6, 100, Red Oak (*Q. rubra*), 3, 1, 9.6, 33; Tulip-tree (*Liriodendron tulipifera*), 17, 5.8, 7.7, 83, Black Oak (*Q. velutina*), 17, 5.8, 6.2, 50. Trees by diameter size class: A (3-6 in) 152, 52, 15, 15; B (6-9 in.) 83, 29, 25, 25; C (9-15 in.) 48, 16, 38.7, 39; D (15-21 in.) 7, 2, 12, 12, F (27-33 in.) 1, .5, 8.2, 8.2. Shrub stems/acre 6.883; ground cover 63%; canopy cover 96%, average canopy height 70 ft (range 59-83). **Edge:** Surrounded on all sides by similar habitat. **Topography:** Fairly level along an old logging road and streambed. **Elevation:** 2330 ft. **Weather:** Rainy. **Coverage:** May 31-June 4; between dawn and 0720, 0940-1055, or 1915-2010. Total party-hours: 6.5. **Census:** Red-eyed Vireo, 7 (115, 47); Ovenbird, 4 (66, 27); Scarlet Tanager, 2; Acadian Flycatcher, 1; Black-and-white Warbler, 1; Worm-eating Warbler, 1; Cerulean Warbler, 1; Hooded Warbler, 1; Rufous-sided Towhee, 1; Wood Thrush, +. **Total:** 10 species; 19 territorial males (313/km², 127/100 acres). **Visitors:** Red-shouldered Hawk, Barred Owl, Pileated Woodpecker, Great Crested Flycatcher, Black-capped Chickadee, Tufted Titmouse, Purple Finch. **Remarks:** Special thanks to Glen Phillips, George Koch, Jo Wood, Carolyn Ruddle and Ruth Strosnider of the Brooks Bird Club for their assistance — *VIRGINIA JOHNSON, 24 Robinson St., Uniontown, PA 15401.*

19. MIXED OAK AND PINE FOREST.—

Location: Virginia, Rockingham Co., 2.9 mi W of Briery Branch; 38°25'47"N, 79°08'05"W, Reddish Knob Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (rectangular, 110 × 880 yds, measured longitudinally and estimated laterally) **Description of Plot:** Representative forest of the relatively level areas bordering streams at the base of the mountains in this Ridge and Valley Province of Virginia. The dominant canopy trees are White Oak (*Quercus alba*) and White Pine (*Pinus strobus*). White Oak and the other oak species represent the probable climax forest of the area. The pine species support other evidence of lumbering within the past 50 years and the White Pine also may indicate the effect of the nearby stream on the microclimate. The most prominent subcanopy trees and shrubs are Flowering Dogwood (*Cornus florida*), Com Serviceberry (*Amelanchier arborea*), and Mountain Laurel (*Kalmia latifolia*). Much of the ground cover is Blueberries (*Vaccinium stamineum* and *V. vacillans*) with localized concentrations of Cinnamon Fern (*Osmunda cinnamomea*) and many scattered plants of Wintergreen (*Gaultheria procumbens*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular 0.1 acre samples, 398/acre; total basal area 130 ft²/acre. Species comprising 90% of the total number of trees: White oak, 100, 25, 36, 100; White Pine, 55, 14, 17, 80; Red Maple (*Acer rubrum*), 70, 18, 9, 100; Red Oak (*Q. rubra*), 22, 5, 9, 80; Pitch Pine (*P. rigida*), 15, 4, 6, 30, Virginia Pine (*P. virginiana*), 15, 4, 4.5, 50, Chestnut Oak (*Q. prinus*), 7, 2, 3.5, 30, dead trees, 32, 8, 3, 80; Scarlet Oak (*Q. coccinea*), 3, 1, 3, 20; Flowering Dogwood, 33, 8, 3, 100, Com. Serviceberry, 15, 4, 2, 80. Trees by diameter size class: A (3-6 in.) 233, 59, 23, 18, B (6-9 in.) 88, 22, 26, 20; C (9-15 in.) 58, 15,

43, 33, D (15-21 in) 15, 4, 27, 21, E (21-27 in) 3, 1, 10, 8. Shrub stems/acre 9867; ground cover 52%; canopy cover 85%; average canopy height 40 ft (range 33-54). **Edge:** Similar vegetation extends along the stream valley about 1 km to the SW and NE and 0.3 km E to an abruptly rising ridge. Marked on the W by the stream and a more gently rising slope. An all-weather gravel road runs parallel to and 200-300 meters E of the plot. **Topography:** Fall is less than 80 ft along the length of the plot. **Elevation:** 1840-1920 ft. **Weather:** Seasonable temperatures and fair, with one 5-day period of rainy and cloudy weather during the first week of July. **Coverage:** June 4, 6-8, 11, 13, 15-16, 18, 26; July 3; between dawn and 1000 or 1930-2100. Total party-hours 13. **Census:** Rufous-sided Towhee, 5 (62, 25); Blue-gray Gnatcatcher, 3.5 (43, 18); Acadian Flycatcher, 3 (37, 15); Red-eyed Vireo, 3; Hooded Warbler, 2.5; Ovenbird 2; Scarlet Tanager, 1.5; Tufted Titmouse, 1; Great Crested Flycatcher, 0.5; Mourning Dove, +; Yellow-billed Cuckoo, +; Whippoorwill, +; Pileated Woodpecker, +; Downy Woodpecker, +; Carolina Chickadee, +; Wood Thrush, +; Brown-headed Cowbird, + (0.5♀/trip); Indigo Bunting, +. **Total:** 18 species; 22 territorial males ($272/\text{km}^2$, 110/100 acres). **Visitors:** Barred Owl, Com. Crow, Pine Warbler, Am. Goldfinch. Thanks to Ellen Goetz, Elwood Fisher, Ann Zimmerman, Sharon Wubben, Charles Ziegenfus and Mike and Kathleen Finnegan for help.—A. CLAIR MELLINGER, Biology Dept., E. Mennonite College, Harrisonburg, VA 22801.

20. 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; $37^{\circ}33'N$, $70^{\circ}04'W$, Amherst Quadrangle, USGS. **Continuity:** Established 1978; 3 intermittent years. **Size:** 13.5 ha = 33.3 acres. **Description of Plot:** See AB 33:61 (1979). **Coverage:** May 28; June 4-5, 10, 12, 19, 30; July 1, 0630-1130. Total man-hours: 18. **Weather:** Mostly overcast and humid through period. Temperature 60-75°F. Rain on July 1. **Census:** Wood Thrush, 16 (119, 48); Acadian Flycatcher, 3 (22, 9); Red-eyed Vireo, 2.5; Yellow-billed Cuckoo, 2; E. Wood Pewee, 2; Blue Jay, 2; Carolina Chickadee, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Scarlet Tanager, 2; Cardinal, 2; Red-bellied Woodpecker, 1.5; Com. Flicker, 1; Pileated Woodpecker, 1; Com. Crow, 1; Carolina Wren, 1; Am. Robin, 1. **Total:** 17 species, 44 territorial males or females ($326/\text{km}^2$, 132/100 acres). **Visitors:** Downy Woodpecker, Great Crested Flycatcher, E. Kingbird, Gray Catbird. **Remarks:** 3 Wood Thrush nests found. Total species declined, while total individuals increased slightly. No cowbirds were found this year in contrast to 4 pairs last year.—ERNEST P. EDWARDS and DOUGLAS H. SHEDD (compiler), Randolph-Macon Woman's College, Lynchburg, VA 24503.

21. UPLAND OAK-HICKORY FOREST. — **Location:** Virginia; Dranesville District Park, McLean, Fairfax Co., along Route 193 (Old Georgetown Pike), approximately 3/4 mi W of Exit 13, Capital Beltway (Interstate 495), $38^{\circ}57'N$, $77^{\circ}12'W$, Falls Church Quadrangle, USGS. **Continuity:** Established 1973, 9 consecutive years. **Size:** 11.0 ha = 27.2 acres. **Description of Plot:** See AB 25:636 (1971). **Weather:** About average throughout period. Temperatures on trips, 56-84°. **Coverage:** Apr. 4, 18-19; May 2, 6, 8, 10, 13, 15, 20, 24, 28, 31; June 4, 7, 11, 13-14, 19-20, 24, 28; 0610-1145 or 1255-1850, EDT. Total man-hours: 66.3. **Census:** Red-eyed Vireo, 14.5 (132, 53); Brown-headed Cowbird, 10 (91, 37); Wood Thrush, 7 (64, 26); Carolina Chickadee, 5 (45, 18); Tufted Titmouse, 5; Red-bellied Woodpecker, 4 (36, 15); Downy Woodpecker, 4; Scarlet Tanager, 3.5 (32, 13); Acadian Flycatcher, 3 (27, 11); E. Wood Pewee, 3; Blue Jay, 3; Com. Grackle, 3; Cardinal 2.5; Hairy Woodpecker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Ovenbird, 1.5; Mourning Dove, 1; Brown Creeper, 1; Worm-eating Warbler, 1; Louisiana Waterthrush, 1; Kentucky Warbler, +. **Total:** 22 species; 79 territorial males ($718/\text{km}^2$, 290/100 acres). **Visitors:** Turkey Vulture, Ruby-throated Hummingbird, Com. Flicker, Pileated Woodpecker, E. Kingbird, Com. Crow, Carolina Wren, Am. Robin, Veery, Blue-gray Gnatcatcher, Yellow-throated Vireo, Black-and-white Warbler, N. Parula, Am. Redstart, Red-winged Blackbird, Indigo Bunting, House Finch, Am. Goldfinch. **Remarks:** Nests found: Mourning Dove 1, Acadian Flycatcher 2, Wood Thrush 2, Red-eyed Vireo 2, Red-bellied Woodpecker 1, E. Wood Pewee 1, Blue Jay 1, Worm-eating Warbler 1, Cardinal 1.—KITTY DICKENS, GILBERT ESPENSHADE, KEITH GUTHRIE, ALLISON and JEAN LYNN, GRETA NILSSON, BILL PER-LEE, MARK STRONG, ROBERT J. WATSON (compiler), 2636 Marcey Road, Arlington, VA 22207.

22. FLOODPLAIN FOREST. — **Location:** North Carolina; Orange Co., within the Univ. of N.C. Mason Farm Reserve, locally known as Big Oak Woods, 3 mi SE of the center of Chapel Hill; $35^{\circ}53'N$, $79^{\circ}0'W$, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 13 ha = 32.1 acres. **Description of Plot:** See AB 32: 63 (1978). **Coverage:** 9 visits between Apr. 19 and June 30. Total party-hours: 19. **Census:** Red-eyed Vireo, 16 (123, 50); Acadian Flycatcher, 9.5 (73, 30); Blue-gray Gnatcatcher, 7.5 (58, 23); Wood Thrush, 6 (46, 19); Tufted Titmouse, 5 (38, 16); Ruby-throated Hummingbird, 3 (23, 9); Red-bellied Woodpecker, 3; Downy Woodpecker, 3; Carolina Chickadee, 3; Hooded Warbler, 3; Cardinal, 3; Carolina Wren, 2.5; Kentucky Warbler, 2.5; Yellow-billed Cuckoo, 2; Scarlet Tanager, 2; Yellow-throated Vireo, 1.5; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; N. Parula, 1; Ovenbird, 1; Pine Warbler, 0.5; Red-shouldered Hawk, +; Mourning Dove, +; Barred Owl, +; Pileated Woodpecker, +; Blue Jay, +; Com. Crow, +; Brown-headed Cowbird, +. **Total:** 27 species; 77 territorial males ($593/\text{km}^2$, 240/100 acres). **Visitors:** E. Wood Pewee, Louisiana Waterthrush, Summer Tanager, Rufous-sided Towhee. **Remarks:** A Louisiana Waterthrush sang on territory for 2 weeks.—C. CHRISTENSEN, S. HALL (co-compiler), A. LINDSEY, K. MEYER, H. MUELLER (co-compiler), H. WILEY. Dept. of Zoology,

Univ. of North Carolina, Chapel Hill, NC 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; $35^{\circ}59'N$, $79^{\circ}04'W$, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973; 8 intermittent years. **Size:** 8.8 ha = 21.8 acres. **Description of Plot:** See AB 27: 1018-1019 (1973). **Weather:** Average conditions. **Coverage:** Apr. 25; May 3, 6, 14, 16, 23, 30; June 6; 0620-0935, EDT. Total man-hours: 28. **Census:** Red-eyed Vireo, 10 (113, 46); Acadian Flycatcher, 4 (45, 18); Wood Thrush, 3.5 (40, 16); Ovenbird, 3 (34, 14); Scarlet Tanager, 2.5; Tufted Titmouse, 2; Carolina Chickadee, 1.5; Ruby-throated Hummingbird, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Carolina Wren, 1; Louisiana Waterthrush, 1; Cardinal, 1; Kentucky Warbler, 0.5; Hairy Woodpecker, +, N. Parula, +. **Total:** 16 species; 33 territorial males or females ($374/\text{km}^2$, 151/100 acres) **Visitors:** Sharp-shinned Hawk, Blue Jay, Blue-gray Gnatcatcher, Hooded Warbler, Brown-headed Cowbird. **Remarks:** Nests located (2): Carolina Chickadee and Tufted Titmouse. An unoccupied Wood Thrush nest was also seen. The total breeding population is again lower than in previous years—in fact, the lowest yet recorded for this plot.—GREG HUNTER, DANIEL KAPLAN, MATTHEW SPENCER, KATIE WEISS, NORMAN BUDNITZ (compiler), Route 1, Box 76A, Durham, NC 27705.

24. 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; $35^{\circ}21'N$, $79^{\circ}01'W$, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1976, 6 consecutive years. **Size:** 12.55 ha = 31 acres. **Description of Plot:** See AB 31: 41 (1977). **Coverage:** 9 visits between Apr. 22 and June 23. Total party-hours: 19. **Census:** Red-eyed Vireo, 12 (96, 39); Wood Thrush, 10.5 (84, 34); Tufted Titmouse, 5 (40, 16), Blue-gray Gnatcatcher, 5; Carolina Chickadee, 3 (24, 10); Carolina Wren, 3; Scarlet Tanager, 3; Cardinal, 3; Acadian Flycatcher, 2.5; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Ovenbird, 2; Summer Tanager, 2; Hairy Woodpecker, 1.5; Hooded Warbler, 1.5; Ruby-throated Hummingbird, 1; Yellow-throated Vireo, 1; Pine Warbler, 1; Kentucky Warbler, 1; Mourning Dove, +; Pileated Woodpecker, +; Blue Jay, +; Com. Crow, +; Brown-headed Cowbird, +. **Total:** 26 species; 66 territorial males ($526/\text{km}^2$, 213/100 acres) **Visitors:** Chimney Swift, Com. Flicker, Com. Grackle. **Remarks:** Nest found: Wood Thrush. Newly fledged Carolina Wrens and Cardinals were seen.—L. APPEN, C. CHRISTENSEN, S. HALL (co-compiler), F. LANE, K. MEYER, H. MUELLER (co-compiler), N. MUELLER, N. POURREAU, B. SIMPSON, M. TOVE, H. WILEY, Dept. of Zoology, Univ. of North Carolina, Chapel Hill, NC 27514.

25. HARDWOOD SWAMP FOREST — **Location:** South Carolina; Dorchester and Berkeley Cos., 6.5 mi E of Harleyville, in

Nat'l Audubon Society's Francis Beidler Forest in Four Holes Swamp; 33°11'N, 80°19'W, Ridgeville Quadrangle, USGS. **Continuity:** Established 1979; 2 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 34: 50 (1980). Sparse canopy of unlogged Laurel Oak (*Quercus laurifolia*) and White Ash (*Fraxinus americana*), with a dense understory that also contains young Sweet Gum (*Liquidambar styraciflua*), Black Willow (*Salix nigra*), Red Maple (*Acer rubrum*), and Bald Cypress (*Taxodium distichum*). **Weather:** Mostly clear, calm and mild, with 3 days of haze or overcast. Temperatures 57-76°F. **Coverage:** Apr. 17, 29; May 5, 12, 14, 20, 26, 29; June 8; dawn-1000 or 1830-dusk. Total party-hours: 17.3. **Census:** Blue-gray Gnatcatcher, 18 (222, 90); N. Parula, 16 (198, 80); White-eyed Vireo, 11 (136, 55); Red-eyed Vireo, 10 (124, 50); Tufted Titmouse, 8 (99, 40); Prothonotary Warbler, 8; Carolina Chickadee, 6.5 (80, 33); Acadian Flycatcher, 6 (74, 30); Hooded Warbler, 6; Swainson's Warbler, 5 (62, 25); Cardinal, 5; Yellow-billed Cuckoo, 4 (49, 20); Red-bellied Woodpecker, 3.5 (43, 18); Downy Woodpecker, 3 (37, 15); Carolina Wren, 2; Yellow-throated Warbler, 2; Pileated Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Wood Thrush, 1.5; Wood Duck, 1; Green Heron, +; White-breasted Nuthatch, +; Yellow-throated Vireo, +; Summer Tanager, +. **Total:** 24 species; 119.5 territorial males (1476/km², 598/100 acres). **Visitors:** Great Blue Heron, Yellow-crowned Night Heron, White Ibis, Red-shouldered Hawk, Mourning Dove, Barred Owl, Com. Crow, Fish Crow, Yellow-breasted Chat, Com. Grackle. **Remarks:** Censuses are conducted every other year, while censuses of a nearby virgin counterpart are conducted on the alternate years. Compared to the 1979 census, the total nesting density and general species composition has remained almost constant, but with a few notable changes in densities of individual species. The increased numbers of Red-eyed Vireos (from 6 to 10) and decreased numbers of White-eyed Vireos (17 to 11), Hooded Warblers (9 to 6), and Wood Thrushes (4 to 1.5) may reflect the decreasing density of undergrowth accompanying the gradual succession of this plot to a mature forest. Prothonotary Warblers increased from 5 to 8, perhaps because the drought that has affected this area for more than a year reduced the normally high nest loss from flooding last year. Compared to the 1980 census of its virgin counterpart, this plot exhibited a 13% greater total nesting density and generally higher densities per species, presumably because of the greater habitat diversity normally found in a second-growth forest. The species with the most noticeably higher densities (White-eyed Vireo, Hooded Warbler, Swainson's Warbler, Cardinal) are generally associated with shrubby thickets and undergrowth, not generally found in the virgin forest; while the few species showing actually lower densities (Great Crested Flycatcher, Red-eyed Vireo, Yellow-throated Warbler) are normally associated with tall trees, which are generally lacking in this logged forest. The Carolina Wren is the only species that showed a dramatic and unexpected reduction in numbers compared to both the 1979 census of this same plot (60% decline) and the 1980 census of the virgin plot

(50% less). This may be part of a widespread trend for this species which has been noted by others. Equally unexpected was the increase in numbers of Carolina Chickadees since 1979 (from 3 to 6.5).—KENNETH STROM (compiler), NORMAN L. BRUNSWIG, MICHAEL R. DAWSON, Route 1, Box 114, Harleyville, SC 29448.

BREEDING BIRD CENSUS OF SWAMP HARDWOOD FOREST IN COASTAL SOUTH CAROLINA

The following 4 census plots are located in an uneven-aged Swamp Hardwood Forest situated in the Santee River Floodplain. The soils are poorly drained with a loamy surface layer and a clay subsoil. All marketable Bald Cypress (*Taxodium distichum*) was cut in the 1930s. The normal flooding of this swamp forest was interrupted with the completion of the Cooper River Rediversion Project in 1940-41.

Each plot was censused 10 times during the breeding season during 0540-0930, EDT (mostly 0610-0830). Counts were conducted on mornings with winds less than 8 mph and no rain except a light rain on 1 count. Temperatures 56-90°F, with most 60-75°. The vegetation was described using 40 0.1-acre circular plots and the methods of James and Shugart (AFN 24: 727-736, 1970).

Two factors had a potential impact on the breeding bird populations. First, precipitation levels were unusually low, especially in April and June. Second, there was a heavy outbreak of Forest Tent Caterpillars (*Malacosoma disstria*, Family Lasiocampidae) in April and early May which defoliated about 52-71% of the hardwood trees. Funds for this study were provided by a grant from the U.S. Forest Service.—DENNIS M. FORSYTHE, Dept. of Biology, The Citadel, Charleston, SC 29409 and W. RUSSELL TYLER, U.S. Forest Service, Witherbee Ranger Station, Francis Marion Nat'l Forest, Rt. 3, P. O. Box 630, Moncks Corner, SC 29461.

26. SWAMP HARDWOOD FOREST I.—
Location: South Carolina, Berkeley Co., 2 mi NE of Alvin on the Santee River, Timber Compartment 8, Witherbee District, Francis Marion Nat'l Forest, Study Plot B-I; 33°22'N, 79°47'W, Bonneau Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (rectangular, 440 × 220 yds, measured by pacing and compass). **Description of Plot:** An uneven-aged stand of swamp hardwoods. The canopy consists of a variety of hardwood species. The understory includes Red Maple (*Acer rubrum*), Am. Elm (*Ulmus americana*), Ironwood (*Carpinus caroliniana*), Hackberry (*Celtis laevigata*), Possum Haw (*Ilex decidua*), greenbrier (*Smilax* spp.), and grape (*Vitis* spp.). The ground cover is mainly Poison Ivy (*Rhus radicans*), False Nettle (*Boehmeria cylindrica*), greenbrier, Trumpet Vine (*Campsis radicans*) and Virginia Creeper (*Parthenocissus quinquefolia*), throughout the sedge (*Carex* spp.) and Lizard's Tail (*Saururus cernuus*) in low areas. A quantitative survey of the vegetation gave the following results: Trees 3 in. in diameter and over, based on forty 0.1-acre circular

samples, 282 trees/acre, total basal area 183.7 ft²/acre. Species comprising 90% of the total number of trees: Red Maple 62, 22, 13, 88; Ironwood 41, 14, 4, 80; Hackberry 19, 7, 4, 90; Green Ash (*Fraxinus pennsylvanica*) 17, 6, 4, 55; hickory (*Carya* sp.) 13, 4, 12, 60, Am. Elm 12, 4, 2, 68; Bald Cypress (*Taxodium distichum*) 12, 4, 20, 45; Possum Haw 8, 3, 0.5, 33. Trees by diameter class: A (3-6 in.) 155, 55, 15, 53; B (6.9 in.) 41, 15, 12, 4, 7, C (9-15 in.) 49, 17, 39, 21; D (15-21 in.) 19, 7, 34.2, 19; E (21-27 in.) 9, 3, 27, 12, 15; F (27-33 in.) 6, 2, 30.6, 17; G (33-40 in.) 3.5, 1, 24, 9, 14. Shrub stems per acre, 767; canopy cover 90%; ground cover 71%; cypress stumps present in 41% of plots; average canopy height 79 ft (range 63-84). **Edge:** Similar habitat on all sides; bounded by an unpaved road on the W. **Topography:** Ridges and sloughs dissect the plot. **Elevation:** Ridges about 14-16 ft (4.3-4.9 m), sloughs about 2-3 ft lower. **Weather:** Temperature 56-75°F, wind 0-5 mph, light rain on one count. April-June temperatures were normal, but rainfall was below average. **Coverage:** Apr. 13, 16, 29, May 12, 19, 29-30; June 2, 15, 19; 0540-0830 EDT. Total man-hours: 24. **Census:** Red-eyed Vireo, 14 (173, 70); N. Parula, 13 (161, 65); Acadian Flycatcher, 10 (124, 50); Prothonotary Warbler, 9 (111, 45); White-eyed Vireo, 7 (86, 35); Cardinal, 5 (62, 25); Am. Redstart, 4.5 (56, 23); Kentucky Warbler, 4 (49, 20); Hooded Warbler 4; Blue-gray Gnatcatcher, 2.5; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Carolina Chickadee, 2; Tufted Titmouse, 2; Pileated Woodpecker, 1; Carolina Wren, 1; Swainson's Warbler, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Downy Woodpecker, 0.5; Indigo Bunting, 0.5. **Total:** 21 species; 87 territorial males (1075/km², 435/100 acres). **Visitors:** Yellow-crowned Night Heron, Barred Owl, Chimney Swift, Com. Crow, Fish Crow, Black-and-white Warbler, Yellow-throated Warbler, Ovenbird, Com. Yellowthroat. **Remarks:** Nests found: White-eyed Vireo, 1, Red-eyed Vireo, 2; Prothonotary Warbler, 1, Kentucky Warbler, 1. Although there was no definite proof, circumstantial evidence of breeding by redstarts was present. The night heron and Ovenbird were seen on only once

27. SWAMP HARDWOOD FOREST II.—
Location: South Carolina, Berkeley Co., 2 mi NE of Alvin on the Santee River, Timber Compartment 8, Witherbee District, Francis Marion Nat'l Forest, Study Plot B-II, 33°22'N, 79°47'W, Bonneau Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (rectangular, 440 × 220 yds, measured by pacing and compass). **Description of Plot:** This is an uneven-aged swamp hardwood forest. The canopy consist of a variety of hardwood species. The understory includes Red Maple (*Acer rubrum*), Am. Elm (*Ulmus americana*), Hackberry (*Celtis laevigata*), Possum Haw (*Ilex decidua*), hawthorn (*Crataegus* spp.), Holly (*I. opaca*), Swamp Dogwood (*Cornus stricta*), greenbrier (*Smilax* spp.) and grape (*Vitis* spp.). The ground cover is mainly Poison Ivy (*Rhus radicans*), False Nettle (*Boehmeria cylindrica*), greenbrier, Trumpet Vine (*Campsis radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*) throughout and

sedge (*Carex* ssp.) and Lizard's Tail (*Saururus cernuus*) in low areas. A quantitative survey of the vegetation gave the following results: Trees 3 in. in diameter and over, based on forty 0.1-acre circular samples, 282 trees/acre; total basal area 190.49 ft²/acre. Species comprising 90% of the total number of trees: Red Maple 80, 28, 10, 100; Sweet Gum (*Liquidambar styraciflua*) 35, 12, 6, 85; Tupelo Gum (*Nyssa aquatica*) 30, 11, 22, 52; Green Ash (*Fraxinus pennsylvanica*) 26, 9, 9, 73, Am. Elm 18, 6, 3, 73; Bald Cypress (*Taxodium distichum*) 14, 5, 20, 62; Cottonwood (*Populus deltoides*) 14, 5, 4, 38; Ironwood (*Carpinus caroliniana*) 13, 5, 1, 38; Possum Haw 12, 4, 0.6, 35; Overcup Oak (*Quercus lyrata*) 8, 3, 13, 50; hawthorn 7, 2, 0.6, 40; Water Hickory (*Carya aquatica*) 6, 2, 7, 50. Trees by diameter class: A (3-6 in.) 161, 57, 18, 03, 9; B (6-9 in.) 51, 18, 15, 15, 8; C (9-15 in.) 37, 13, 29.8, 15; D (15-21 in.) 14, 5, 24, 3, 12; E (21-27 in.) 7, 2, 22.4, 11; F (27-33 in.) 5, 2, 23.3, 12; G (33-40 in.) 6, 2, 42.6, 22; H (> 40 in.) 2, 1, 20.29, 10. Shrub stems per acre 725; canopy cover 87%; ground cover 64%, cypress stumps present in 45% of plots; average canopy height 79 ft (range 64-82). **Edge:** Similar habitat on all sides; bounded by an unpaved road on the W; on the N by Plot B-I. **Topography:** Ridges and sloughs dissect the plot. **Elevation:** Ridges about 14-16 ft (4.3-4.9 m); sloughs about 2-3 ft lower. **Weather:** Temperature 57-92°F, wind 0-7 mph, no rain on any counts. **Coverage:** Apr. 14, 18, 30; May 11, 20-21, 28; June 10, 16, 18; 0610-0835, EDT. Total man-hours: 24. **Census:** Red-eyed Vireo 14 (173, 70); N. Parula, 13.5 (167, 68); Acadian Flycatcher, 9 (111, 45); White-eyed Vireo, 8 (99, 40); Prothonotary Warbler, 6.5 (80, 33); Cardinal, 6 (74, 30); Hooded Warbler, 5 (62, 25); Am. Redstart, 5; Tufted Titmouse, 4 (49, 20); Blue-gray Gnatcatcher, 4; Kentucky Warbler, 4; Carolina Chickadee, 3 (37, 15); Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Carolina Wren, 2; Summer Tanager, 2; Swainson's Warbler, 1.5; Pileated Woodpecker, 1; Downy Woodpecker, 1; Indigo Bunting, 1; Brown-headed Cowbird, 0.5. **Total:** 21 species; 95 territorial males (1174/km²; 475/100 acres). **Visitors:** Swallow-tailed Kite, Turkey, Barred Owl, Mourning Dove, Chimney Swift, Ruby-throated Hummingbird, Great Crested Flycatcher, Com. Crow, Black-and-white Warbler, Com. Yellowthroat. **Remarks:** Nests found: Carolina Chickadee, 1; Prothonotary Warbler, 1. The kite, Turkey and crested flycatcher were seen only once.

28. SWAMP HARDWOOD FOREST III.

— **Location:** South Carolina, Berkeley Co., 2 mi NE of Alvin on the Santee River, Timber Compartment 9, Witherbee District, Francis Marion Nat'l Forest, Study Plot C-I; 33°22'N, 79°47'W, Bonneau Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (rectangular, 368 × 264 yds, measured by pacing and compass). **Description of Plot:** This swamp hardwood forest has a canopy of various hardwood tree species. The understory includes Red Maple (*Acer rubrum*), Am Elm (*Ulmus americana*), Possum Haw (*Ilex decidua*), Red Mulberry (*Morus rubra*), Hackberry (*Celtis laevigata*), Holly (*I. opaca*), Swamp Dogwood (*Cornus stricta*),

greenbrier (*Smilax* ssp.), and grape (*Vitis* ssp.). The ground cover is mainly Poison Ivy (*Rhus radicans*), False Nettle (*Boehmeria cylindrica*), greenbrier, Trumpet Vine (*Campsis radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*) throughout and sedge (*Carex* ssp.) and Lizard's Tail (*Saururus cernuus*) in low areas. A quantitative survey of the vegetation gave the following results: trees 3 in. in diameter and over, based on forty 0.1-acre circular samples, 218 trees per acre; total basal area 153.72 ft²/acre. Species comprising 90% of the total number of trees: Red Maple 74, 34, 14, 98; Tupelo Gum (*Nyssa aquatica*) 22, 10, 27, 72; Am. Elm 21, 10, 2, 80; Sweet Gum (*Liquidambar styraciflua*) 20, 9, 5, 80; Green Ash (*Fraxinus pennsylvanica*) 14, 7, 6, 50; Bald Cypress (*Taxodium distichum*) 15, 7, 18, 52; Overcup Oak (*Quercus lyrata*) 14, 6, 12, 75; Possum Haw 10, 4, 0.1, 32; Water Hickory (*Carya aquatica*) 6, 3, 7, 42; Laurel Oak (*Q. laurifolia*) 7, 3, 5, 40. Trees by diameter class: A (3-6 in.) 114, 53, 11.4, 7; B (6-9 in.) 40, 18, 11.85, 8; C (9-15 in.) 38, 17, 29.8, 19; D (15-21 in.) 13, 6, 23.4, 15; E (21-27 in.) 5, 2, 16.28, 11; F (27-33 in.) 3, 1, 14.7, 10; G (33-40 in.) 2.5, 1, 17.75, 12; H (> 40 in.) 2, 1, 28.52, 18. Shrub stems per acre 679; canopy cover 88%; ground cover 52%; cypress stumps present in 60% of plots; average canopy height 79 ft (range 61-90). **Edge:** Similar habitat on all sides; bounded by unpaved roads on the N and E. **Topography:** Ridges and sloughs dissect the plot. **Elevation:** Ridges about 14-16 ft (4.3-4.9 m); sloughs about 2-3 ft lower. **Weather:** Temperature 57-80°F; wind 0-8 mph; no rain on any count. **Coverage:** Apr. 16, 28; May 1, 14, 18, 24, 26, 31; June 9, 17; 0540-0835, EDT. Total man-hours: 24. **Census:** Red-eyed Vireo, 17 (210, 85); N. Parula, 16 (198, 80); Acadian Flycatcher, 9 (111, 45); White-eyed Vireo, 9; Prothonotary Warbler, 9; Cardinal, 6.5 (80, 33); Am. Redstart, 6 (74, 30); Hooded Warbler, 5 (62, 25); Tufted Titmouse, 4 (49, 20); Kentucky Warbler, 4; Blue-gray Gnatcatcher, 3.5 (43, 18); Carolina Chickadee, 3 (37, 15); Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Carolina Wren, 2; Swainson's Warbler, 2; Brown-headed Cowbird, 2; Pileated Woodpecker, 1; Downy Woodpecker, 1; Indigo Bunting, 1. **Total:** 20 species; 105 territorial males (1297/km²; 525/100 acres). **Visitors:** Swallow-tailed Kite, Red-shouldered Hawk, Barred Owl, Chimney Swift, Ruby-throated Hummingbird, Great Crested Flycatcher, Com. Crow, Fish Crow, Am. Robin, Wood Thrush, Black-and-white Warbler, Yellow-throated Warbler, Com. Yellowthroat, Summer Tanager. **Remarks:** Nests found: Tufted Titmouse, 1; Red-eyed Vireo, 1; N. Parula, 1; Kentucky Warbler, 1. The kite and robin were seen only once.

29. SWAMP HARDWOOD FOREST IV.

— **Location:** South Carolina, Berkeley Co., 2 mi NE of Alvin on the Santee River, Timber Compartment 9, Witherbee District, Francis Marion Nat'l Forest, Study Plot C-II; 33°22'N, 79°47'W, Bonneau Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (rectangular, 368 × 264 yds, measured by pacing and compass). **Description of Plot:** This swamp hardwood forest is adjacent to

Study Plot C-I. The understory includes Red Maple (*Acer rubrum*), Ironwood (*Carpinus caroliniana*), hawthorn (*Crataegus* ssp.), Am. Elm (*Ulmus americana*), Possum Haw (*Ilex decidua*), greenbrier (*Smilax* ssp.), and grape (*Vitis* ssp.). The ground cover is mostly False Nettle (*Boehmeria cylindrica*), Poison Ivy (*Rhus radicans*), greenbrier, Virginia Creeper (*Parthenocissus quinquefolia*), Trumpet Vine (*Campsis radicans*) throughout, and Lizard's Tail (*Saururus cernuus*) and sedge (*Carex* ssp.) in sloughs. A quantitative survey of the vegetation gave the following results: Trees 3 in. in diameter and over, based on forty 0.1-acre circular samples, 248 trees/acre; total basal area 171.62 ft²/acre. Species comprising 90% of the total number of trees: Red Maple 94, 38, 13, 100; Tupelo Gum (*Nyssa aquatica*) 23, 9, 17, 83; Am. Elm 20, 8, 4, 80; Sweet Gum (*Liquidambar styraciflua*) 16, 7, 10, 75; Green Ash (*Fraxinus pennsylvanica*) 16, 7, 7, 65; Bald Cypress (*Taxodium distichum*) 14, 6, 22, 70; Ironwood 14, 6, 1, 33; Water Hickory (*Carya aquatica*) 11, 4, 12, 50; Overcup Oak (*Quercus lyrata*) 9, 4, 9, 70; Possum Haw 8, 3, 0.5, 35. Trees by diameter class: A (3-6 in.) 134, 54, 13.37, 8; B (6-9 in.) 40, 16, 12.15, 7; C (9-15 in.) 28, 12, 22.4, 13; D (15-21 in.) 25, 10, 45, 26; E (21-27 in.) 12, 5, 37.98, 22; F (27-33 in.) 6, 2, 26.95, 16; G (33-40 in.) 2, 1, 10.6, 6; H (> 40 in.) 1, 0.3, 12.07, 7. Shrub stems per acre 591; canopy cover 92%; ground cover 59%, cypress stumps present in 58% of plots; average canopy height 77 ft (range 58-94). **Edge:** Similar habitat on all sides; bounded by an unpaved road on the N. **Topography:** Ridges and sloughs dissect the plot. **Elevation:** Ridges about 14-16 ft (4.3-4.9 m); sloughs about 2 to 3 ft lower. **Weather:** Temperature 57-78°F, wind 0-7 mph, no rain on any count. **Coverage:** Apr. 17, 22; May 3, 15, 17, 23, 25, June 1, 7, 18; 0540-0830, EDT. Total man-hours: 24. **Census:** Red-eyed Vireo, 15 (185, 75); N. Parula, 12 (148, 60); Acadian Flycatcher, 9 (111, 45); Prothonotary Warbler, 9; White-eyed Vireo, 8 (99, 40); Hooded Warbler, 5 (62, 25); Cardinal, 5; Kentucky Warbler, 4 (49, 20); Am. Redstart, 4; Blue-gray Gnatcatcher, 3 (37, 15); Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Tufted Titmouse, 2; Carolina Wren, 2; Swainson's Warbler, 2; Pileated Woodpecker, 1; Carolina Chickadee, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Indigo Bunting, 1. **Total:** 21 species; 91 territorial males (1124/km²; 455/100 acres). **Visitors:** Red-shouldered Hawk, Barred Owl, Chimney Swift, Ruby-throated Hummingbird, Hairy Woodpecker, Great Crested Flycatcher, Com. Crow, Fish Crow, Wood Thrush, Yellow-throated Vireo, Black-and-white Warbler, Yellow-throated Warbler, Com. Yellowthroat. **Remarks:** Nests found: Red-eyed Vireo, 2, N. Parula, 1. The hummingbird and vireo were seen only once.

30. VIRGIN HARDWOOD BOTTOM-LAND SWAMP FOREST.

— **Location:** South Carolina; Richland Co., Congaree Swamp Nat'l Monument, 16 mi SE Columbia; 33°N, 80°49'W, Gadsden Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 35:57 (1981). **Weather:** Very dry and warm

Coverage: April 22, 24, 28, May 1, 11, 15, 22, 29; June 9; between dawn and 1000, EST. Total man-hours: 32. **Census:** N. Parula, 20 (247, 100); Red-eyed Vireo, 5 (62, 25); Yellow-billed Cuckoo, 3 (37, 15); Acadian Flycatcher, 3; Tufted Titmouse, 3; Carolina Wren, 3; Cardinal, 3; Red-bellied Woodpecker, 2; Carolina Chickadee, 2; White-eyed Vireo, 2; Yellow-throated Warbler, 2; White-breasted Nuthatch, 1.5; Prothonotary Warbler, 1.5; Barred Owl, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Hooded Warbler, 1; Summer Tanager, 1. **Total:** 22 species; 60 territorial males ($741/\text{km}^2$, 300/100 acres). **Visitors:** Yellow-crowned Night Heron, Wood Duck, Red-shouldered Hawk, Chimney Swift, Ruby-throated Hummingbird, Fish Crow, Wood Thrush, Am. Redstart, Com. Grackle. **Remarks:** A second year of extreme drought again prevailed in swamp; no standing water was present and sloughs were "bone" dry. Number of breeding pairs down by 20% from last year, perhaps in response to drought. Northern Parula by far the dominant species, being 4 times as abundant as the next most common species, the Red-eyed Vireo; 45% of breeders are cavity nesters, while 54% are tropical migrants. One new "hole" in forest canopy was created by fallen old-growth timber. Nests found (2): Pileated Woodpecker and Cardinal; young Barred Owls seen several times during latter census periods. Thanks to Robert McDaniels, Superintendent, Congaree Swamp Nat'l Mon. for permission to conduct study.—*JOHN EMMETT CELY, Nongame-Endangered Species Section, S.C. Wildlife and Marine Res. Dept., P.O. Box 167, Columbia, SC 29202.*

31. MATURE BEECH-MAGNOLIA FOREST. — **Location:** Florida; Leon Co., Tall Timbers Research Station, Woodyard Hammock, 22 mi N of Tallahassee; $30^\circ 40' \text{N}$, $84^\circ 15' \text{W}$; Beachton Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 15.75 ha = 38.9 acres. **Description of Plot:** See AB 35:58 (1981). **Weather:** Mostly fair. **Coverage:** Apr. 12, 17, 30; May 2, 10, 14, 22, 29. Total man-hours: 24.75. **Census:** N. Parula, 17 (108, 44); Acadian Flycatcher, 14.5 (92, 37); Red-eyed Vireo, 9.5 (60, 24); Tufted Titmouse, 5 (32, 13); Carolina Wren, 5; Hooded Warbler, 5; Cardinal, 5; White-eyed Vireo, 3 (19, 8); Yellow-billed Cuckoo, 2.5; Ruby-throated Hummingbird, 2.5; Brown-headed Cowbird, 2.5; Red-bellied Woodpecker, 2; Blue-gray Gnatcatcher, 2; Pileated Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Red-shouldered Hawk, 1; Downy Woodpecker, 1; Blue Jay, 1; Carolina Chickadee, 1; Louisiana Waterthrush, 1; Wood Duck, +; Turkey, +; Barred Owl, +; Hairy Woodpecker, +; Com. Crow, +; Wood Thrush, +; Yellow-throated Vireo, +; Prothonotary Warbler, +; Kentucky Warbler, +; Summer Tanager, +. **Total:** 30 species; 83.5 territorial males ($530/\text{km}^2$, 215/100 acres). **Remarks:** This spring was very dry. The creek and the gum pond dried up completely. Thanks to Tall Timbers Research Station for financial assistance and permission to conduct research on the plot.—*TODD ENGSTROM, Dept. of Biological*

Science, Fla State Univ, Tallahassee, FL 32306.

32. SILVER MAPLE SWAMP. — **Location:** Ontario; Campbellville, Mountsberg Wildlife Centre, 40 P/8h ed.2 (Freelton), Grid #788123, $43^\circ 28' \text{N}$, $80^\circ 02' \text{W}$. **Continuity:** New. **Size:** 9.9 ha = 24.46 acres (trapezoidal, measured with tape on ground). **Description of Plot:** Dominant canopy trees are Silver Maple (*Acer saccharinum*) and Red Maple (*A. rubrum*). There are many areas of permanent standing water and some areas of intermittent standing water which became increasingly dry toward the end of the breeding season. One narrow tongue of mesic woods (maple, Beech, Hemlock) constitutes approximately 13% of the plot's area. Sensitive Fern (*Onoclea sensibilis*) is the dominant ground cover in areas not permanently covered by water. A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over based on 0.1 acre circular samples, 325/acre; total basal area $113.4 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Silver Maple, 171, 53, 45.9, 100; Red Maple, 52, 16, 19.5, 86; Sugar Maple, (*A. saccharum*) 32, 10, 8.5, 14; Red Ash (*Fraxinus pennsylvanica*), 18, 6, 4.0, 43; White Birch (*Betula papyrifera*), 13, 4, 3.1, 43; willow (*Salix* sp.), 13, 4, 8.3, 43. Trees by diameter size class: A (3-6 in.) 150, 46, 15.0, 13.2; B (6-9 in.) 101, 31, 30.2, 26.7; C (9-15 in.) 67, 21, 53.8, 47.4; D (15-21 in.) 6, 2, 10.1, 8.9; E (21-27 in.) 1, 0, 4.3, 3.8. Shrub stems: See Remarks; ground cover 60%; canopy cover 60%; average canopy height (est.) 49 ft (range 38-60). **Edge:** Bordered on 1 side by similar habitat, on 2 sides by roads and by pasture on the fourth. Along the 3 sides of dissimilar habitat, a reasonable buffer was maintained. **Topography:** Flat. **Elevation:** 970 ft (299 m). **Weather:** Generally clear and hot with good visibility; 1 trip partially rained out. **Coverage:** 1980: May 26; June 5, 14, 18, 25, 27-28; July 1, 4-5, 0555-0920; and 1845-2045. Total man-hours: 21.5. **Census:** Song Sparrow, 7 (71, 29); E. Wood Pewee, 5 (51, 20); Black-capped Chickadee, 4 (40, 16); N. Waterthrush, 4; N. Oriole, 4; Com. Grackle, 4; Veery, 3.5 (35, 14); Am. Robin, 3 (30, 12); Wood Thrush, 3; Great Crested Flycatcher, 2.5; Red-eyed Vireo, 2.5; Com. Flicker, 2; Hairy Woodpecker, 2; Downy Woodpecker, 2; Brown Creeper, 2; E. Kingbird, 1.5; Tree Swallow, 1; Blue Jay, 1; Com. Crow, 1; White breasted Nuthatch, 1; House Wren, 1; Cedar Waxwing, 1; Yellow-throated Vireo, 1; Ovenbird, 1; Rose-breasted Grosbeak, 1; Am. Kestrel, +; Least Flycatcher, +; Blue-gray Gnatcatcher, +; Gray Catbird, +; Com. Yellowthroat, +; Red-winged Blackbird, +. **Total:** 31 species; 61 territorial males or females ($616/\text{km}^2$, 249/100 acre). **Visitors:** Canada Goose, Blue-winged Teal, Ruffed Grouse, Am. Woodcock, Com. Nighthawk, Belted Kingfisher, Pileated Woodpecker, Barn Swallow, Starling, Warbling Vireo, Am. Goldfinch. **Remarks:** Nests found: Hairy Woodpecker, 2; Downy Woodpecker, 1; Tree Swallow, 1. The territories of both the Ovenbird and White-breasted Nuthatch were associated more with the mesic "tongue" of woods than the surrounding swamp. The catbird territory was re-

stricted to a shrubbier portion of the plot edge. Because of the dispersed nature of the Blue Jay registrations (no clustering), one territory should be considered a conservative estimate. Total number of Blue Jay registrations was 33, mean registrations/trip were 3.3, and registrations were made on 9 of 10 trips. No attempt was made to determine Brown-headed Cowbird density because of the unsuitability of the methodology. Brown-headed Cowbird registrations were made on 7 of 10 trips. Shrub stem density is not given because the methodology paper was misinterpreted. The authors are indebted to the Halton Region Conservation Authority for permission to publish this study. Thanks to I.S. Liepins for assistance with the vegetation analysis.—*M.J. SHARP, Department of Botany and Genetics, Univ. of Guelph, Guelph, Ontario) and T.N. TOBIAS, School of Urban and Regional Planning, Univ. of Waterloo, Waterloo, Ontario.*

33. UPLAND MAPLE FOREST. — **Location:** Ontario; 4.5 mi N of Milton, Tirion Forestry Tract (Halton Region Conservation Authority Property), 30 M 12/d ed. 1 (Milton), Grid #836229, $43^\circ 33' 25'' \text{N}$, $79^\circ 57' 50'' \text{W}$. **Continuity:** New. **Size:** 10 ha = 24.7 acres (measured by tape). **Description of Plot:** The dominant canopy tree is Sugar Maple (*Acer saccharum*) with an ash (*Fraxinus americana* and *F. pennsylvanica*) sub-canopy. The SE corner has a strong Quaking Aspen (*Populus tremuloides*) component as a result of a former fire. There are numerous rocky outcrops and ponds, one of which was large enough to change the local canopy composition to Silver Maple (*A. saccharinum*) with Largetooth Aspen (*P. grandidentata*)—E. White Cedar (*Thuja occidentalis*) edges Leatherwood (*Dirca palustris*) and Alternate-leaved Dogwood (*Cornus alternifolia*) are typical shrub species. Scattered mature Red Oaks (*Quercus rubra*) are likely the remains of what was once a strong component which has been decimated by past logging operations. Trees, 3 in. dia. and over, based on seven 0.1 acres circular samples, 275/acre; total basal area $102.8 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Sugar Maple, 161, 58, 56.2, 100, ash species, 27, 10, 6.0, 86; Quaking Aspen, 14, 5, 13.6, 57; Yellow Birch (*Betula alleghaniensis*), 20, 7, 5.2, 43; E. White Cedar, 11, 4, 1.4, 43; Silver Maple, 10, 4, 10.8, 43; White Birch (*B. papyrifera*), 10, 4, 1.5, 29. Trees by diameter size class A (3-6 in.) 136, 49, 13.6, 13.2; B (6-9 in.) 71, 26, 21.4, 20.8, C (9-15 in.) 57, 21, 45.9, 44.6; D (15-21 in.) 10, 4, 17.6, 17.1; E (21-27 in.) 1, 1, 4.3, 4.2. Shrub stems: see Remarks. Ground cover, 50%; canopy cover, 84%; average canopy height, 62 ft (range 43-80). **Edge:** Bordered on all sides by at least 75 m of similar habitat. **Topography:** Rolling with many limestone outcrops. **Elevation:** 1075 ft (331 m). **Weather:** Generally clear with good visibility, wind an inhibiting factor on 2 visits and lightly raining on last transect of 1. **Coverage:** 1980: May 26; June 6, 12, 16, 21, 23; July 1, 4, 11; between 0600-0925 and 1900-2055. Total man-hours 20. **Census:** Red-eyed Vireo, 4.5 (45, 18); E. Wood Pewee, 3 (30, 12); Wood Thrush, 3; Rose-breasted Grosbeak, 3; Veery, 2.5; Ovenbird, 2.5; N. Oriole, 2.5,

Downy Woodpecker, 2; Great Crested Flycatcher, 2; N. Waterthrush, 2; White-breasted Nuthatch, 1.5; Com. Flicker, 1; Black-capped Chickadee, 1; Am. Robin, 1; Cedar Waxwing, 1; Com. Grackle, 1; Scarlet Tanager, 1; Yellow-throated Vireo, 0.5; Brown-headed Cowbird and Blue Jay, see Remarks; Turkey Vulture, +; Red-tailed Hawk, +. **Total:** 22 species; 35 territorial males or females ($350/\text{km}^2$, 142/100 acre). **Visitors:** Ruffed Grouse, Pileated Woodpecker, Hairy Woodpecker, Tree Swallow, Barn Swallow, Com. Crow, Brown Creeper, Gray Catbird, Starling, Black-and-white Warbler, Am. Goldfinch. **Remarks:** Nest found Turkey Vulture. The Black-and-white Warbler was seen only once at the height of the breeding season and displayed an active defense. The registrations for Blue Jays were so dispersed that we felt the number of territories could not be reliably estimated although it was present often enough to be considered a breeder. Total number of Blue Jay registrations was 20, mean registrations/trip was 2.2, and registrations were made on all 9 trips. No attempt was made to determine Brown-headed Cowbird density because of the unsuitability of the methodology. Total number of Brown-headed Cowbird registrations was 11, mean registrations/trip was 1.2 and registrations were recorded 7 of the 9 trips. Shrub stem density is not given because the methodology paper was misinterpreted. Thanks to D.P. Coulson, V.L. Edge and I.S. Liepins for assistance with the vegetation analysis. We are indebted to the Halton Region Conservation Authority for permission to publish this study.—*M.J. SHARP Dept. of Botany and Genetics, Univ. of Guelph, Guelph, Ontario* and *T.N. TOBIAS, School of Urban and Regional Planning, Univ. of Waterloo, Waterloo, Ontario.*

34. WOODED CITY RAVINE. — **Location:** Ontario; York Co., Toronto, Moore Park Ravine between Moore Ave. and Chorley Park; $43^\circ 41' \text{N}$, $79^\circ 22' 30'' \text{W}$. **Continuity:** Established 1966; 12 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See *AB 25* 993 (1971). **Coverage:** Apr. 5, 12, 26; June 1-2, 5-6, 8, 10, 17, 23, 27; July 8; 0630-0900. Total man-hours: 20. **Weather:** 6 sunny days, 5 cool days, cloudy; 2 wet days. Average temperature 57.8°F ($38^\circ\text{-}65^\circ$). **Census:** Cardinal, 8 (40, 16); Am. Robin, 6 (30, 12); Blue Jay, 5 (25, 10); Downy Woodpecker, 4 (20, 8); Indigo Bunting, 4; Great Crested Flycatcher, 3 (15, 6); Black-capped Chickadee, 3; Wood Thrush, 3; House Sparrow, 2; Gray Catbird, 1; Starling, 1; N. Oriole, 1; Song Sparrow, 1; Com. Flicker, +; White-breasted Nuthatch, +. **Total:** 15 species; 42 territorial males ($210/\text{km}^2$, 85/100 acres). **Remarks:** The continuing disappearance of open areas owing to natural regrowth, is reflected in the decline, over the 11-year period of the Com. Flicker (4 to +), Mourning Dove, (2 to 0), and Song Sparrow, (4 to 1). The Indigo Bunting, after a year's absence, came back to 4 (avg. for 11 years—4.3). The cowbirds, which had paralleled the decline of the Indigo Buntings, were found in only 4 scattered locations early in the season.—*ERIC NASMITH, 289 Donwoods Drive, Toronto, Ontario, Canada, M4N 2G1.*

35. ELM-ASH-BIRCH FOREST. — **Location:** Minnesota; Clearwater Co., Univ. of Minn. Forestry and Biological Station, Itasca State Park; $47^\circ 10' \text{N}$, $95^\circ 12' \text{W}$, Lake Itasca Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 8.7 ha = 21.5 acres. **Description of Plot:** See *AB 35*: 58-59 (1981). **Weather:** Mostly calm, and clear to partly cloudy, with average temperatures. **Coverage:** June 24-July 2, 4; 0600-0900, 0700-0930, and 1800-2000 hours. Total man-hours: 27. **Census:** Red-eyed Vireo, 21 (241, 98); Ovenbird, 19 (218, 88); Least Flycatcher, 11 (126, 51); Blackburnian Warbler, 7 (80, 33); Veery, 4 (46, 19); Black-capped Chickadee, 3; N. Parula, 3; Ruby-throated Hummingbird, 2; Yellow-bellied Sapsucker, 2; Hairy Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Am. Robin, 2; White-breasted Nuthatch, 2; Black-and-white Warbler, 2; Black-throated Green Warbler, 2; Mourning Warbler, 2; Brown-headed Cowbird, 2; Am. Redstart, 1.5; Rose-breasted Grosbeak, 1.5; Broad-winged Hawk, 1; Barred Owl, 1; Com. Flicker, 1; E. Wood Pewee, 1; Am. Crow, 1; Red-breasted Nuthatch, 1; Brown Creeper, 1; Yellow Warbler, 1; Purple Finch, 1. **Total:** 29 species; 102 territorial males ($1172/\text{km}^2$, 474/100 acres). **Visitors:** Ruffed Grouse, Pileated Woodpecker, Black-backed Three-toed Woodpecker, Cedar Waxwing, Blue Jay, Chestnut-sided Warbler, Com. Yellowthroat, N. Oriole, Scarlet Tanager, Evening Grosbeak, Chipping Sparrow. **Remarks:** Black-billed Cuckoos heard frequently after censusing completed. Black-throated Green Warbler female was observed feeding a Brown-headed Cowbird nestling; no warbler nestlings were present. The grid placement was changed somewhat from the 1980 census so that the edge effect was minimized; this in turn affected the species located in the plot. Special thanks to Frances C. James for instruction, and to John Morton, Richard Wiesler, and Jeb Barzen for gathering data.—*MELISSA NAGEL, 1403 N. Cleveland Ave., St. Paul, MN 55108; and SARAH MADSEN, 317 N. Milroy, Olympia, Wa. 98502.*

36. MATURE ASPEN-NORTHERN HARDWOODS FOREST. — **Location:** Minnesota; Cass Co., on the Pike Bay Experimental Forest, Chippewa Nat'l Forest, NE $\frac{1}{4}$ of SE $\frac{1}{4}$, Sec. 6, T144N, R30W; $47^\circ 19' \text{N}$, $94^\circ 30' \text{W}$; Pike Bay Quadrangle, USGS. **Continuity:** Smaller subplot of area censused in 1977 and same as 1979. **Size:** 13.85 ha = 34.2 acres. **Description of Plot:** See *AB 32*: 65 (1977). **Weather:** Warm, calm and humid first 2 days. Mild, breezy and partly cloudy last 4 days. **Coverage:** June 2, 3, 15, 16, 30; July 1; 0500-1100. Total man-hours: 18. **Census:** Least Flycatcher, 22 (159, 64); Ovenbird, 14.5 (105, 42); Red-eyed Vireo, 12 (87, 35); E. Wood Pewee, 4 (29, 12); Veery, 4; Yellow-bellied Sapsucker, 1.5; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Yellow-throated Vireo, 1; Scarlet Tanager, 1; Purple Finch, 1; Broad-winged Hawk, 0.5; Downy Woodpecker, 0.5; Blue Jay, 0.5; Am. Robin, 0.5; Brown-headed Cowbird, 0.5; Hairy Woodpecker, +; Great Crested Flycatcher, +; Rose-breasted Grosbeak, +. **Total:** 19 species; 65.5 territorial males (473/km², 192/100 acres) **Remarks:** Nests found: 1 Least Flycatcher; 1 Robin; 2 Ovenbird.—*DON RAKSTAD and JOHN R. PROBST, N. Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.*

37. MATURE BIRCH-ASPEN. — **Location:** Minnesota; Itasca Co., Chippewa Nat'l Forest, NE $\frac{1}{4}$ of SE $\frac{1}{4}$, Sec. 2, T57N, R25W, $47^\circ 26' \text{N}$, $93^\circ 28' \text{W}$; Lawrence Lake W. Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres. **Description of Plot:** The primary canopy species is Paper Birch (*Betula papyrifera*) with scattered Quaking Aspen (*Populus tremuloides*) and Balsam Fir (*Abies balsamea*). Almost no shrub layer with a ground cover predominantly of grass, Bracken (*Pteridium aquilinum*), and Wild Sarsaparilla (*Aralia nudicaulis*). **Edge:** Bordered on the S by an aspen clearcut (1 year); on the W, N and E by mixed hardwood-coniferous forest. **Topography:** Essentially flat. **Elevation:** 1380-1385 ft. **Weather:** Normal temperatures; clear to partly cloudy during census hours. **Coverage:** May 31; June 1, 14, 17, 27, 29; 0500-1100. Total man-hours: 16. **Census:** Red-eyed Vireo, 8.5 (105, 43); Ovenbird, 6.5 (80, 33); Black-throated Green Warbler, 3.5 (43, 18); Black-capped Chickadee, 2; Yellow-bellied Sapsucker, 1.5; Red-breasted Nuthatch, 1; Scarlet Tanager, 1; Goshawk, 0.5; Great Crested Flycatcher, 0.5; Barred Owl, +; Blue Jay, +; Rose-breasted Grosbeak, +; Purple Finch, +. **Total:** 13 species, 25 territorial males ($309/\text{km}^2$, 125/100 acres). **Remarks:** Nests found: Goshawk, 1; Black-capped Chickadee, 1; Ovenbird, 1.—*DON RAKSTAD and JOHN R. PROBST, N. Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108*

38. 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; $42^\circ 56' \text{N}$, $88^\circ 14' \text{W}$, Muskego Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 5.4 ha = 13.3 acres. **Description of Plot:** See *AB 32* 66 (1978). **Weather:** Normal temperatures and rainfall throughout the period. **Coverage:** June 6, 13, 17, 20, 25; 0600-1030. Total man-hours: 8. **Census:** Red-eyed Vireo, 3 (56, 23); Wood Thrush, 2; E. Wood Pewee, 1.5; Com. Flicker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Starling, 1; Chestnut-sided Warbler, 1; Ovenbird, 1. **Total:** 11 species; 14.5 territorial males ($269/\text{km}^2$, 109/100 acres). **Visitors:** Yellow-billed Cuckoo, Acadian Flycatcher.—*BOB ADAMS, VERN AUNE (compiler), S 13 W 22167 Ridge Road, Waukesha, WI 53186.*

39. ASPEN CLEARCUT. — **Location:** Minnesota; Carlton Co., in the Cloquet Forestry Center, Univ. of Minn., SE $\frac{1}{4}$, Sec. 32, T49N, R 17W; Iverson Quadrangle, USGS. **Continuity:** New. Part of area previously censused in 1977 and 1978 as a mature Aspen-Birch forest. **Size:** 9.9 ha = 24.4 acres. **Description of Plot:** Density of Quaking Aspen (*Populus tremuloides*) variable in different sections of the plot. Heights from 2.5-5 ft. Area clearcut in summer of 1979

Edge: See AB 32: 65 (1978). **Topography:** Essentially flat with a gully in northern part. **Elevation:** 1250 ft. **Weather:** Normal temperatures. Clear to partly cloudy. **Coverage:** May 29; June 5, 11, 19, 25; July 1; 0600-0930. Total man-hours: 16. **Census:** Mourning Warbler, 4.5 (46, 18); Song Sparrow, 2.5; Indigo Bunting, 2; Com. Flicker, 1; Ruby-throated Hummingbird, 1; Olive-sided Flycatcher, 0.5; Am. Robin, +; Chestnut-sided Warbler, +; Brown-headed Cowbird, +; White-throated Sparrow, +. **Total:** 10 species, 11.5 territorial males (116/km²; 47/100 acres). — **DON RAKSTAD and JOHN R. PROBST, North Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.**

40. ASPEN CLEARCUT. — **Location:** Minnesota, Itasca Co., Chippewa Nat'l Forest, NE 1/4 of SE 1/4, Sec. 3, T57N, R25W. Lawrence Lake W. Quadrangle, USGS. **Continuity:** New. **Size:** 10.6 ha = 26.3 acres. **Description of Plot:** Situated in the same clearcut on the W edge of the plot censused in 1977 and 1979 (see AB 32: 79, 1978). This site is slightly higher, drier, and denser, with fewer openings than the adjoining plot. Average height of saplings 20 ft. Dense understory growth of hazel. **Edge:** Bordered on E, S, and W by similar vegetation. Part of S border is swampy with willow thickets; N boundary is a young Red Pine plantation. **Topography:** Essentially flat with slope on S edge. **Weather:** Normal temperatures; clear to partly cloudy during census hours. **Coverage:** May 31, June 4, 13, 17, 27, 29; 0500-1100. Total man-hours: 18. **Census:** Veery, 5.5 (52, 21); Chestnut-sided Warbler, 5.5; Mourning Warbler, 4.5 (42, 17); Rose-breasted Grosbeak, 3 (28, 11); White-throated Sparrow, 2.5; Golden-winged Warbler, 1.5; Nashville Warbler, 1.5; Ovenbird, 1.5; Canada Warbler, 1; Am. Woodcock, 0.5; Gray Catbird, 0.5; Com. Yellowthroat, 0.5; Com. Flicker, 0.5; Blue Jay, +; Black-and-white Warbler, +; Am. Redstart, +. **Total:** 16 species; 28.5 territorial males (268/km²; 108/100 acres). **Remarks:** Nests found: Chestnut-sided Warbler, 1; Golden-winged Warbler, 1; woodcock.— **DON RAKSTAD and JOHN R. PROBST, North Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.**

41. ASPEN CLEARCUT. — **Location:** Michigan; Ontonagon Co., NE 1/4, Sec. 18, T49N, R39W; 46°40'N, 89°10'W; Rockland Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 9 ha = 22.2 acres. **Description of Plot:** See AB 35: 59 (1981). Aspen now averages 4-5 ft in height (range 2.5-10). Not as wet as last year. Dense ground cover consisting primarily of sedges and asters with some large patches of Willow-herb (*Epilobium* sp.). **Weather:** Normal temperatures but humidity above normal. Calm, partly cloudy to overcast. **Coverage:** May 28-29; June 10-11, 24-25; 0500-110. Total man-hours: 13. **Census:** Song Sparrow, 5.5 (61, 25); Mourning Warbler, 5 (56, 23); White-throated Sparrow, 3.5 (39, 16); Com. Flicker, 1; Am. Robin, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1; Com. Nighthawk, 0.5; Nashville Warbler, 0.5; Com. Snipe, +; E. Kingbird, +; Tree Swallow, +; Brown-headed Cowbird, +; Evening Grosbeak, +. **Total:** 14

species, 19 territorial males (211/km², 86/100 acres). **Remarks:** Nests found: Com. Flicker, 1; Song Sparrow, 1; goldfinch, 1.— **DON RAKSTAD and JOHN R. PROBST, North Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.**

42. ASPEN CLEARCUT. — **Location:** Michigan; Ontonagon Co.; SE 1/4, Sec. 8, T49N, R39W; 46°40'N, 89°10'W; Rockland Quadrangle, USGS. **Continuity:** Established 1978; 3 intermittent years. **Size:** 18.5 ha = 45.6 acres. **Description of Plot:** See AB 33:77 (1979). **Weather:** Normal temperatures but humidity above normal. Calm, partly cloudy to overcast. **Coverage:** May 28-29; June 10-11, 24-25; 0500-1100. Total man-hours: 19.5. **Census:** Song Sparrow, 7.5 (41, 16); Alder Flycatcher, 5 (27, 11); Mourning Warbler, 4 (22, 9); Chestnut-sided Warbler, 3.5 (19, 8); Indigo Bunting, 3.5; White-throated Sparrow, 3.5; Am. Robin, 2; Veery, 2; Am. Redstart, 2; Rose-breasted Grosbeak, 2; Killdeer, 1.5; Am. Woodcock, 1.5; Ruby-throated Hummingbird, 1.5; Cedar Waxwing, 1.5; Am. Goldfinch, 1.5; Black-billed Cuckoo, 1; Com. Flicker, 1; Brown Thrasher, 1; Black-and-white Warbler, 1; Golden-winged Warbler, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 1; Brown-headed Cowbird, 1; Wood Pewee, 0.5; Red-eyed Vireo, 0.5; Ruffed Grouse, +; Chimney Swift, +; E. Kingbird, +; Olive-sided Flycatcher, +; Blue Jay, +; Black-capped Chickadee, +; N. Oriole, +; Nashville Warbler, +; Purple Finch, +. **Total:** 34 species; 51.5 territorial males (279/km²; 113/100 acres). **Remarks:** Nests found: Black-billed Cuckoo, 1; Veery, 1; Song Sparrow, 2.— **DON RAKSTAD and JOHN R. PROBST, North Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.**

43. 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; 8 consecutive years. **Size:** 9.3 ha = 23 acres. **Description of Plot:** See AB 28:1005-1006 (1974). **Weather:** Temperatures 32-60°F. Overcast on 4 trips, otherwise clear. Max. wind 10 mph. April tended to be mild, while mid-to-late May turned much cooler, which made for an early season. **Coverage:** Apr. 8, 10, 22-23; May 7, 14, 19-21, 24, 29; June 5; 0545-1000, EDT. Total man-hours: 25. **Census:** Starling, 14 (150, 61); Cardinal, 12 (129, 52); Com. Flicker, 9 (97, 39); Downy Woodpecker, 9; Am. Robin, 6.5 (70, 28); Blue Jay, 6 (64, 26); Ring-necked Pheasant, 5.5 (59, 24); Red-headed Woodpecker, 5 (54, 22); Black-capped Chickadee, 5; Red-eyed Vireo, 3.5 (38, 15); Great Crested Flycatcher, 3 (32, 13); Com. Crow, 3; White-breasted Nuthatch, 3; Ovenbird, 3; Song Sparrow, 3; Mallard, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Gray Catbird, 2; Wood Thrush, 2; Red-winged Blackbird, 2; Canada Goose, 1; Am. Kestrel, 1; Hairy Woodpecker, 1; Yellow Warbler, 1; Am. Goldfinch, 1; E. Kingbird, 0.5; E. Meadowlark, 0.5. **Total:** 28 species; 108.5 territorial males (1166/km², 472/100 acres). **Visitors:** Green Heron, Blue-winged Teal, Bobwhite, Chimney Swift, Cedar Waxwing, Savannah Sparrow. **Remarks:** After several years of

decline, species totals have returned to about average. Territorial males, however, have hit a record high, jumping 44% over 1980 figures. Bird populations in this area seem to have bounced back from earlier extremely harsh winters and benefited greatly from the mild winter of 2 years ago and the average winter last year. Bobwhite, whose numbers were decimated by the bad weather, appeared this year as a visitor. Nests found included Am Kestrel, 1; Com. Crow, 1; several Starling Young seen: Mallard, Am. Robin—**BETTY CHALLIS, Oakland Audubon Society, 2335 Pontiac Lk. Rd., Pontiac, MI 48054.**

44. OAK-HICKORY FOREST. — **Location:** Illinois; Lake Co., Lake County Forest Preserve District MacArthur Woods Acquisition, 500 m NW of intersection of Rt. 60 and St. Mary's Rd.; 42°14'N, 87°56'W, Wheeling Quadrangle, USGS. **Continuity:** New. **Size:** 6.0 ha = 14.8 acres (rectangular, N and S sides 200m, E and W sides 300m; laid out with 50m measuring tape and compass) **Description of Plot:** This woods was heavily logged 100 years ago and lightly logged 40 years ago. The woods is not clearly stratified. The understory is thick and visibility at eye level is poor. The canopy is 24-29m high and 58% closed. Point-quarter analysis of 25 points indicated canopy composition to be White Oak (*Quercus alba*) 55%, Shagbark Hickory (*Carya ovata*) 16%; Red Oak (*Q. rubra*) 15%, White Ash (*Fraxinus americana*) 10% and Swamp White Oak (*Q. bicolor*) 3%. Average dbh 35.4 cm (range 15-80cm), density 230 trees/ha. The understory composition is Hop Hornbeam (*Ostrya virginiana*) 44%, hawthorn (*Crateagus* sp.) 22%, Ironwood (*Carpinus carolina*) 7%, White Oak 5%, Slippery Elm (*Ulmus rubra*) 5%, Com. Buckthorn (*Rhamnus cathartica*) 2%, Shagbark Hickory 2% and White Ash, Black Cherry (*Prunus serotina*) and Am Basswood (*Tilia americana*) <1% each, density 1176 trees/ha. Herbaceous ground cover averages 34%. **Edge:** Bordered on N, S, and E by 200-400m of similar forest. Bordered on W by 250m of similar forest which then begins to become increasingly mesic as it extends for another 425m and slopes downward to the Des Plaines River. **Topography:** Relatively flat. **Elevation:** 650 ft. **Weather:** Normal temperatures (50°-75°F) and precipitation. **Coverage:** June 2, 3, 5-7, 10-12, 14-15, 18, 20-21; 0530-0900. Total man-hours 21.75. **Census:** Ovenbird, 6 (100, 41); Black-capped Chickadee, 5 (83, 34); Veery, 4 (67, 27); E. Wood Pewee, 3.5 (58, 24); Blue Jay, 3.5; Com. Flicker, 3 (50, 20); Cedar Waxwing, 3; Com. Grackle, 3; Hairy Woodpecker, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Wood Thrush, 2; Rose-breasted Grosbeak, 2; Great Crested Flycatcher, 1.5, Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Brown Creeper, 1; House Wren, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Cardinal, 1; Rufous-sided Towhee, +. **Total:** 22 species; 49.5 territorial males or females (826/km², 334/100 acres). **Remarks:** Comparison to 2 previous unpublished censuses of this woods (1977, 1979) indicates that Brown Creepers are increasing in number and expanding their nesting habitat. This species used to nest only in the bottomland Sugar Maple (*Acer saccharum*) section but is now utilizing the drier uplands as well. A

Chestnut-sided Warbler inhabited the very NE edge of this woods and sang consistently throughout June. I thank Dale Birkenholz, James Neal, Tom Poulson and Joe Schecki for their aid and the Lake County Forest Preserve District for permission to study this woods and enthusiastic support.—SCOTT HICKMAN, Biology Dept., College of Lake Co., 19351 W. Washington St., Grayslake, IL 60030.

45. OAK-HICKORY-MAPLE FOREST INTERIOR. — **Location:** Illinois, McLean Co., Moraine View State Park, 3 mi S Ellsworth; T22, R4E, SE 1/4, Sec 34, Arrowsmith Quadrangle, USGS. **Continuity:** Established 1976; 6 consecutive years. **Size:** 13.0 ha = 32 acres. **Description of Plot:** See AB 31:43 (1977). **Coverage:** June 3-5, 19, 23-24 Total man-hours: 11. **Census:** E. Wood Pewee, 3 (23, 9); House Wren, 3; Red-eyed Vireo, 3; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Am. Robin, 2; Wood Thrush, 2; Cardinal, 2; Com. Flicker, 1; Red-headed Woodpecker, 1; Acadian Flycatcher, 1; Blue Jay, 1; Black-capped Chickadee, 1; Tufted Titmouse, 1; Veery, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Brown-headed Cowbird, +. **Total:** 21 species, 32 territorial males (247/km², 100/100 acres). **Remarks:** A decrease in the number of House Wrens (5 to 3) and Wood Thrushes (5 to 2) were the significant changes from last year. The Veery continues as a summer resident although no nest was found. Ovenbirds were absent for the second consecutive year.—DALE E. BIRKENHOLZ, Dept. of Biological Sciences, Ill. State Univ., Normal, IL 61761.

46. BLACK OAK-SASSAFRAS WOODS. — **Location:** Indiana; Porter Co., 1.5 mi E intersection of Rtes 49 and 12, within Indiana Dunes Nat'l Lakeshore. Area bisected by country road and bridle path; 41°39'N, 87°02'W, Dune Acres Quadrangle, USGS. **Continuity:** Established 1974; 8 consecutive years. **Size:** 22.22 ha = 54.9 acres. **Description of Plot:** Wooded dune and sand prairie area burned in 1971. Dense sucker growth and downed trees make areas impenetrable. See AB 28: 1007 (1974). **Weather:** Heavy storms and above average rainfall in June and July. **Coverage:** Apr. 1-July 25. Total man-hours 37. **Census:** Rufous-sided Towhee, 8 (36, 15); Field Sparrow, 4 (18, 7); Gray Catbird, 2; Brown Thrasher, 2; Com. Yellowthroat, 2; Great Crested Flycatcher, 1; Blue Jay, 1; Black-capped Chickadee, 1; Yellow Warbler, 1; Cardinal, 1; Rose-breasted Grosbeak, 1. **Total:** 11 species; 24 territorial males (108/km², 44/100 acres). **Remarks:** Increasing density of understory is reducing breeding birds.—EMMA B. PITCHER 46 E. State Park Boundary Road, Chesterton, IN 46304.

47. NEOTOMA VALLEY. — **Location:** Ohio, Hocking Co., Good Hope Township, NW 1/4, Sec. 16, T13N, R18W; 39°36'N, 82°34'W, Rockbridge Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 20.2 ha = 50 acres. **Description of Plot:** See AB 33: 37-38 (1979). **Weather:** More

than 4 inches of rain fell during the 24-hr period prior to census June 6, causing nest destruction, damage, or delay. Habitat changes: the historic meadow immediately S of the plot was completely disrupted by natural gas pipeline construction. **Coverage:** June 6-8. Total party-hours: Approximately 120 (by members and guests of the Wheaton Club). **Census:** Red-eyed Vireo, 10 (49, 20); Wood Thrush, 9 (44, 18); Scarlet Tanager, 8 (40, 16); Acadian Flycatcher, 6 (30, 12); Ovenbird, 6; E. Wood Pewee, 4 (20, 8); Cerulean Warbler, 4; Red-bellied Woodpecker, 3 (15, 6); Downy Woodpecker, 3; Tufted Titmouse, 3; White-breasted Nuthatch, 3; Black-and-white Warbler, 3; Cardinal, 3; Yellow-billed Cuckoo, 2; Great Crested Flycatcher, 2; E. Phoebe, 2; Blue Jay, 2; Yellow-throated Vireo, 2; Worm-eating Warbler, 2; Kentucky Warbler, 2; Hooded Warbler, 2; Turkey Vulture, 1; Ruffed Grouse, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Carolina Chickadee, 1; Blue-gray Gnatcatcher, 1; Louisiana Waterthrush, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Indigo Bunting, 1; Am. Goldfinch, 1. **Total:** 33 species; 93 territorial males/females (460/km², 186/100 acres). **Remarks:** Twelve nests were located. The absence of expected species may be temporary. The plot was incorporated in the territories of the Red-tailed and Broad-winged Hawks, Barred, Great Horned, and Screech Owls. Breeding status of the Veery could not be established. Special thanks to Randy Little for extra census efforts.—A.H. CLAUGUS (compiler), 228 S. Lake St., Carey, OH 43316.

48. VIRGIN BEECH-MAPLE FOREST. — **Location:** Ohio; Preble Co., Hueston Woods State Park, 4 mi N of Oxford near intersection of Brown and Main Loop Rds.; SE 1/4, SW 1/4, Sec. 34, T6N, R1E, College Corner Quadrangle, USGS. **Continuity:** Established 1973; 7 intermittent years. **Size:** 6.1 ha = 15 acres. **Description of Plot:** See AB 28: 1009-1010 (1974). **Weather:** May was unseasonably hot and humid with much rainfall, typical of mid to late summer; June was warm and dry. **Coverage:** Apr. 29 to June 20; 0600-1130 hours. Total man-hours: 13. **Census:** Acadian Flycatcher, 14 (231, 93); Blue-gray Gnatcatcher, 6.5 (107, 43); Red-eyed Vireo, 6.5; Tufted Titmouse, 5 (82, 33); Brown-headed Cowbird, 4 (66, 27); Cardinal, 4; Red-bellied Woodpecker, 3.5 (58, 23); Downy Woodpecker, 3.5; Carolina Chickadee, 3.5; E. Wood Pewee, 3 (49, 20); Yellow-billed Cuckoo, 2.5; Red-headed Woodpecker, 2.5; Great Crested Flycatcher, 2.5; White-breasted Nuthatch, 2.5; Com. Flicker, 2; Wood Duck, 1; Hairy Woodpecker, 1; Com. Crow, 1; Yellow-throated Vireo, 1; Cerulean Warbler, 1; House Sparrow, 1; Barred Owl, 0.5; Pileated Woodpecker, 0.5; Kentucky Warbler, 0.5; Blue Jay, +. **Total:** 25 species; 73 territorial males or females (1203/km², 487/100 acres). **Visitors:** E. Kingbird, Am. Robin, Wood Thrush, Cedar Waxwing, Ovenbird, Louisiana Waterthrush, N. Oriole, Scarlet Tanager, Rose-breasted Grosbeak, Indigo Bunting, Am. Goldfinch. **Remarks:** Total number of territorial males or females increased from 51 to 73. Of this increase, 75% resulted from the inclusion of early nesters (Carolina Chic-

kadee, Tufted Titmouse and White-breasted Nuthatch) and the record high densities of Acadian Flycatchers (14 in 1981, 11.5 in 1975), Red-bellied Woodpeckers (3.5 in 1981, 3 in 1975) and Downy Woodpeckers (3.5 in 1981, 2 in 4 previous years). Although Carolina Wrens have become increasingly conspicuous in the vicinity of Hueston Woods State Park since the population was destroyed during the harsh winter of 1976-1977, none have yet been observed in the beech-maple forest. Thanks to the ODNR Division of Natural Areas and Preserves and to Hueston Woods State Park for permission to conduct research in the beech-maple forest.—JOHN A. SMALLWOOD, Dept. of Zoology, Miami Univ., Oxford, OH 45056

49. OZARK OAK-HICKORY FOREST, SECOND GROWTH. — **Location:** Missouri, St. Louis Co., Washington Univ. Tyson Research Center, on I-44, 8 mi. SW of I-270, 38°31'N, 90°34'W, Manchester Quadrangle, USGS. **Continuity:** Second BBC; first WB-PS 1980. **Size:** 7.85 ha = 19.4 acres. **Description of Plot:** See AB 35: 25. Tyson Research Center, acquired from U.S. Army, a fenced 810 ha (= 2000 acre) tract of second growth oak-hickory forest, was established in 1963. Census plot is along either side of a fire trail through uniform woodlands. An old field is located 400 ft S of the S edge of the plot; two small ponds are located 600 ft NE of the E end of the strip. **Weather:** On a.m. trips, sky was clear 4 trips, overcast 3, cloudy 3. On p.m. trips sky was clear once; overcast once, a.m. temperatures 59-76°F, p.m. 70-80°. No significant winds; precipitation well above average. **Coverage:** June 7-8, 12, 20, 22-24, 27-28; July 1; 05:50-09:30 CDT; June 25, 27, 21:05-22:30 CDT. **Census:** Unidentified (probably mostly Carolina) chickadee, 6 (76, 31); Tufted Titmouse, 6; Indigo Bunting, 5 (64, 26); Blue Jay, 4 (51, 21); White-breasted Nuthatch, 4; Cardinal, 4; Summer Tanager, 3 (38, 15); Red-bellied Woodpecker, 2.5; Yellow-billed Cuckoo, 2; Downy Woodpecker, 2; Wood Thrush, 2; Red-eyed Vireo, 2; Great Crested Flycatcher, 1.5 (19, 8); Hairy Woodpecker, 1; Am. Robin, 1; Worm-eating Warbler, 1; Scarlet Tanager, 1; Turkey, +; Com. Flicker, +; Pileated Woodpecker, +; E. Phoebe, +; Blue-gray Gnatcatcher, +; Ovenbird, +; Brown-headed Cowbird, +; Rufous-sided Towhee, +. **Total:** 25 species, 48 territorial males (611/km²; 247/100 acres). **Visitors:** Mourning Dove, Com. Crow, Com. Grackle, Am. Goldfinch. **Remarks:** A caprimulgid was seen on one of the two p.m. trips but could not be identified to species.—RICHARD W. COLES (compiler), EMILY BEVER, ROSE ANN BODMAN, JEAN COOK, MARY FRANCIS GOODLOE, FLOYD AND VI HALLETT, SYLVIA HOSSLER, EUGENIA LARSON (co-compiler), CARMEN PATTERSON, BILL RUDDEN. A project of the Webster Groves Nature Study Society conducted at Tyson Research Center, P.O. Box 258, Eureka, MO 63025.

50. 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; 6 consecutive years. **Size:** 11.8 ha = 29.2 acres. **Description of Plot:** See AB 31: 50-51 (1977). **Weather:** Boston temperature for May was 1.8°F above normal, for June 2.74°F above; rainfall in May was 2.3 in below normal, in June 1.54 in below. **Coverage:** Apr. 16, 23; May 4, 12, 18, 22, 25-26, 29-30; June 3-4, 23, 28-29; 0515-1125. Total man-hours: 25. **Census:** Veery, 5 (42, 17); Ovenbird, 5; Blue Jay, 4 (34, 14); Rufous-sided Towhee, 4; Com. Yellowthroat, 3 (25, 10); Scarlet Tanager, 3; Cardinal, 3; Tufted Titmouse, 2.5; Black-capped Chickadee, 2; White-breasted Nuthatch, 2; Wood Thrush, 2; Blue-winged Warbler, 2; Com. Flicker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; Gray Catbird, 1; Black-and-white Warbler, 1; N. Oriole, 1; Com. Grackle, 1; Broad-winged Hawk, +; Ruffed Grouse, +; Downy Woodpecker, +; Am. Robin, +. **Total:** 23 species; 44.5 territorial males or females ($377/\text{km}^2$, 152/100 acres). **Visitors:** Barn Swallow, Brown Thrasher, Starling, Field Sparrow. **Remarks:** Nests found: flicker, crow, chickadee, grackle, 1 each; Blue Jay 2. The absence of cuckoos correlates with a low density of Gypsy Moths. A ♀ Brown-headed Cowbird was observed on May 26.—WILLIAM E. DAVIS, JR., College of Basic Studies, Boston Univ., Boston, MA 02215.

51. CLIMAX HEMLOCK-WHITE PINE FOREST, WITH TRANSITION HARDWOODS. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield, 41°43'20"N, 73°12'W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 15 intermittent years. **Size:** 10.52 ha = 26 acres. **Description of Plot:** See AFN 19 594-595 (1965). **Coverage:** Apr. 9; June 2-3, 7-11. Total man-hours: 14. **Census:** Blackburnian Warbler, 16 (152, 62); Ovenbird, 10 (95, 38); Black-throated Green Warbler, 8 (76, 31); Veery, 7 (67, 27); Black-capped Chickadee, 6 (57, 23); Scarlet Tanager, 5 (48, 19); Brown Creeper, 4 (38, 15); Red-eyed Vireo, 3.5 (33, 13); Blue Jay, 3 (29, 12); Red-breasted Nuthatch, 3; Solitary Vireo, 3; Pine Warbler, 3; Great Crested Flycatcher, 2.5; Com. Crow, 2.5; Ruby-throated Hummingbird, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Wood Thrush, 2; Black-and-white Warbler, 2; Com. Yellowthroat, 2; Brown-headed Cowbird, 2; Barred Owl, 1.5; Song Sparrow, 1.5; Broad-winged Hawk, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Yellow-rumped Warbler, 1; Com. Grackle, 1; Cardinal, 1; Purple Finch, 1; Mourning Dove, 0.5; Great Horned Owl, 0.5; Yellow-billed Cuckoo, +; Black-billed Cuckoo, +; Pileated Woodpecker, +. **Total:** 35 species; 101.5 territorial males ($965/\text{km}^2$, 390/100 acres). **Remarks:** A very stable plot with no significant changes. An illustration of this is the increase in 0.5 territorial males over last year.—ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.

52. RED PINE PLANTATION-CLIMAX HEMLOCK FOREST WITH TRANSITION HARDWOODS. — **Location:** Connecticut; Hartford Co., on the S side of Rt. 20, in the town of Hartland, 1 mi W of E Hartland, 42°00'30"N, 72°55'30"W, W Granville Quad-

rangle, USGS. **Continuity:** New Size: 8.1 ha = 20 acres (irregular shape, measured with tape and compass). **Description of Plot:** Red Pine-spruce plantation planted in 1935, with climax Hemlock forest pockets and transition hardwoods. Red Pine (*Pinus resinosa*) and Hemlock (*Tsuga canadensis*) dominate the canopy. Principal shrubs include Mountain Laurel (*Kalmia latifolia*) and Blueberry (*Vaccinium corymbosum*). Principal saplings include Am. Beech (*Fagus grandifolia*), Red Maple (*Acer rubrum*), and Hemlock. Principal ground cover includes Wild Sarsaparilla (*Aralia nudicaulis*), Canada Mayflower (*Uvularia sessilifolia*), Clintonia borealis, Solomon's Seal (*Polygonatum biflorum*), and Running Pine (*Lycopodium complanatum*). A quantitative survey of the vegetation gave the following results: trees 3 in. in diameter and over based on 7 0.1-acre circular plots, 530 trees/acre; total basal area 135 ft.²/acre. Species constituting 95% of the total number of trees; Red Pine, 156, 34, 45, 57; Hemlock, 67, 15, 29, 43; Red Maple, 56, 12, 8, 43; dead trees, 56, 12, 6, 71; Black Spruce (*Picea mariana*), 37, 8, 3, 14; Norway Spruce (*P. abies*), 30, 7, 5, 29; White Spruce (*P. glauca*), 30, 7, 4, 29. Trees by diameter size class: A (3-6 in.) 96, 22, 4, 71; B (6-9 in.) 163, 25, 12, 71; C (9-15 in.) 174, 53, 84, 100. Shrub stems/acre 2250; ground cover, 50%; shrub cover, 40%; canopy cover, 80%; canopy height, 67 ft (range 40-78 ft). **Edge:** Bordered on N by northern hardwoods; E by gravel parking lot; SE by a stream with marshy edges; S by semi-permanent stream and similar habitat; SW by a bog; W by mixed forest. **Topography:** Gently sloping from N and center to E, S, and W, with numerous poorly drained areas. **Elevation:** 1150 ft. **Weather:** Mostly clear, light winds, and mild. Temperatures 45-85°F. Much drier than normal. **Coverage:** Apr 26; May 3, 13-14, 19, 21, 23, 25, 31; June 1, 7, 15, 23, 29, 30; 0500-2100 hrs. Total man-hours: 53. **Census:** Ovenbird, 12 (148, 60); Blackburnian Warbler, 5 (62, 25); Black-and-white Warbler, 3 (37, 15); Black-capped Chickadee, 2.5; Red-breasted Nuthatch, 2.5; Blue Jay, 2; Brown Creeper, 2; Magnolia Warbler, 2; Black-throated Blue Warbler, 2; Hermit Thrush, 1.5; Veery, 1.5; Solitary Vireo, 1.5; Scarlet Tanager, 1.5; Purple Finch, 1; Rufous-sided Towhee, 1; Red-shouldered Hawk, 0.5; Ruffed Grouse, 0.5; Tufted Titmouse, 0.5; Red-eyed Vireo, 0.5; Black-throated Green Warbler, 0.5; Louisiana Waterthrush, 0.5; Com. Yellowthroat, 0.5; Canada Warbler, 0.5; N. Oriole, 0.5; Dark-eyed Junco, 0.5; Saw-whet Owl, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; E. Wood Pewee, +; Song Sparrow, +. **Total:** 30 species; 46 territorial males ($568/\text{km}^2$, 230/100 acres). **Visitors:** Broad-winged Hawk, Barred Owl, Yellow-bellied Sapsucker, Hairy Woodpecker, Downy Woodpecker, Com. Crow, White-breasted Nuthatch, Am. Robin, Blue-gray Gnatcatcher, Golden-crowned Kinglet, Cedar Waxwing, Blue-winged Warbler, Yellow-rumped Warbler, Pine Warbler, N. Waterthrush, Am. Goldfinch, White-throated Sparrow. **Remarks:** Nests found: Black-capped Chickadee; Black-throated Blue Warbler, 2; Blackburnian Warbler, 1; Ovenbird, 3; Scarlet Tanager, 1. Young observed:

Ruffed Grouse, Black-capped Chickadee (10), Blackburnian Warbler (4), Ovenbird (11), Rufous-sided Towhee, Song Sparrow (3). Moderate Gypsy Moth defoliation—DAVID P. ROSGEN, RFD, 3 Laurel Way, Winsted, CT 06098.

53. WHITE PINE-HEMLOCK-NORTHERN HARDWOODS FOREST. — **Location:** Connecticut; Litchfield Co., on the Phelps Research Area of the Nature Conservancy in the NW corner of Colebrook; 42°01'00"N, 73°07'30"W, Tolland Center and Sandersfield Quadrangle, Mass.-Conn. 1958, photo-revised 1969. **Continuity:** Established 1979, 3 consecutive years. **Size:** 14.3 ha = 35.3 acres (initially treated as two separate censuses, currently as one). **Description of Plot:** See AB 34: 56 (1980). **Weather:** (1980) Precipitation below average. Clear weather was encountered on each of the 5 trips. **Coverage:** June 15, 24, 28; July 2, 9; 0500-1000, EDT. **Total man-hours:** 20. **Census (1980):** Black-capped Chickadee, 6 (42, 17); Ovenbird, 6; Wood Thrush, 5 (35, 14); Red-eyed Vireo, 5; Blue Jay, 4 (28, 11); Veery, 4; White-throated Sparrow, 4; Black-and-white Warbler, 3 (21, 8); Brown Creeper, 2; Blackburnian Warbler, 2; E. Wood Pewee, 1; White-breasted Nuthatch, 1; House Wren, 1; Black-throated Green Warbler, 1; Chestnut-sided Warbler, 1; Scarlet Tanager, 1; Cardinal, 1; Ruffed Grouse, 0.5; E. Phoebe, 0.5; Com. Yellowthroat, 0.5; Rose-breasted Grosbeak, 0.5; Song Sparrow, 0.5; Com. Flicker, +; Downy Woodpecker, +; Red-breasted Nuthatch, +; Gray Catbird, +; Am. Robin, +; Cedar Waxwing, +; Yellow-rumped Warbler, +; Am. Redstart, +; Red-winged Blackbird, +; Brown-headed Cowbird, +. **Total:** 32 species; 50.5 territorial males ($353/\text{km}^2$, 143/100 acres). **Remarks:** A change of census takers, late-start and reduction to only 5 trips may partly explain the lower numbers from the previous year, i.e., Blackburnian Warbler down from 12 to 2. This also may reflect a difference in the individuals involved. **Weather:** (1981): Overcast 6 of the 9 trips, with light rain on 1. Rainfall was still slightly below average for the spring. **Coverage:** May 10, 16, 25, 31; June 6, 13, 20; July 2, 8, 0500-1100 and 1700-2100, EDT. **Total man-hours:** 34. **Census (1981):** Ovenbird, 9.5 (66, 27); Wood Thrush, 9 (63, 25); Veery, 7 (49, 20); Red-eyed Vireo, 7; Black-capped Chickadee, 5 (35, 14); Black-and-white Warbler, 5; Blue Jay, 4 (28, 11); Brown Creeper, 3.5 (25, 10); White-breasted Nuthatch, 2.5; Blackburnian Warbler, 2; Black-throated Green Warbler, 2; Scarlet Tanager, 2; White-throated Sparrow, 2; Rose-breasted Grosbeak, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Yellow-bellied Sapsucker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Red-breasted Nuthatch, 1; Yellow-rumped Warbler, 1; Brown-headed Cowbird, 1; Hairy Woodpecker, 0.5; Chestnut-sided Warbler, 0.5; Cardinal, 0.5; Song Sparrow, 0.5; Am. Robin, +; Yellow Warbler, +; Canada Warbler, +; Am. Redstart, +. **Total:** 31 species; 73 territorial males or females ($511/\text{km}^2$, 207/100 acres). **Visitors:** Ruffed Grouse, Black-billed Cuckoo, Pileated Woodpecker, Great Crested Flycatcher, E. Phoebe, Barn Swallow, Am.

Crow, House Wren, Gray Catbird, Pine Warbler, Blue-winged Warbler, Louisiana Waterthrush, Com. Yellowthroat, Red-winged Blackbird, N. Oriole, Am. Goldfinch, Chipping Sparrow, Swamp Sparrow. **Remarks:** Nests found: Yellow-bellied Sapsucker, 1; Brown Creeper, 1; Ovenbird, 1. In addition, adults of the following species were observed feeding young: Hairy Woodpecker, Ovenbird. There was heavy Gypsy Moth defoliation throughout the area S of the plot. Defoliation was delayed 2-3 weeks in Colebrook and was not as complete as it was to the S. Blackburnian Warbler numbers were far below those recorded 3 years ago.—*RAYMOND BELDING*, Windmill Road, Harwinton, CT 06791.

54. BEECH-SPRUCE-HEMLOCK FOREST. — **Location:** New York; Hamilton Co., along W shore of Catlin Lake; 44°N, 74°15'W, Long Lake Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 23.9 ha = 59 acres (3.5 ha added in 1981). **Description of Plot:** See AB 35: 64 (1981). An independent sample of vegetation taken in 1981 gave the following results: Trees 3 cm diameter and over, based on 50 0.1-acre circular samples, 546/acre; total basal area 195.4 ft²/acre. Species comprising at least 90% of the total number of trees: Beech (*Fagus grandifolia*), 234, 43, 13, 100; dead trees, 98, 18, 18, 100; Red Spruce (*Picea rubens*), 98, 18, 14, 98; Yellow Birch (*Betula alleghaniensis*), 44, 8, 24, 94; Hemlock (*Tsuga canadensis*), 38, 7, 17, 86. Trees by diameter size class: S (3-8 cm) 286, 52, 7.4, 4; A (8-15 cm) 94, 17, 9.5, 5; B (15-23 cm) 52, 10, 15.7, 8; C (23-38 cm) 61, 11, 48, 8, 25; D (38-53 cm) 38, 7, 65.8, 34; E (53-69 cm) 13, 2, 40.3, 21; F (69-84 cm) 2, 0.4, 7, 9, 4. Shrub stems/acre 505; ground cover 50%, canopy cover 90%; average canopy height 18 m (range 5.5-30 m). **Weather:** Temperatures and precipitation normal throughout period. **Coverage:** June 3, 8, 10-12, 18, 25, 27-28; between dawn and 1130. Total man-hours: 43.5. **Census:** Blackburnian Warbler, 28 (117, 47); Red-eyed Vireo, 26.5 (111, 45); Am. Redstart, 11.5 (48, 19); Black-throated Green Warbler, 10 (42, 17); Swainson's Thrush, 9 (38, 15); Black-throated Blue Warbler, 7.5 (31, 13); Solitary Vireo, 6 (25, 10); Black-capped Chickadee, 5 (21, 8); Ovenbird, 4 (17, 7); Magnolia Warbler, 4; Brown Creeper, 3 (13, 5); Golden-crowned Kinglet, 3; Yellow-rumped Warbler, 3; Winter Wren, 2.5; Scarlet Tanager, 2; Yellow-bellied Sapsucker, 1.5; Broad-winged Hawk, 1; Hairy Woodpecker, 1; Ruby-throated Hummingbird, 1; Black-and-white Warbler, 1; E. Wood Pewee, 0.5. **Total:** 21 species; 131 territorial males (549/km², 222/100 acres). **Visitors:** Pileated Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Least Flycatcher, Blue Jay, White-breasted Nuthatch, Red-breasted Nuthatch, Wood Thrush, Veery, Rose-breasted Grosbeak, Purple Finch. **Remarks:** Nests found: Broad-winged Hawk, Yellow-bellied Sapsucker, Black-capped Chickadee, Swainson's Thrush, Black-throated Blue Warbler. This study was conducted at the Adirondack Ecological Center, SUNY College of Environmental Science and Forestry, Newcomb, NY.—*BARRY R. NOON, SAM DROEGE, ROBIN A. BINGHAM, and DEANNA K. DAWSON*, Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, MD 20708.

DEANNA K. DAWSON, Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, MD 20708.

55. BEECH-SPRUCE-MAPLE FOREST.

— **Location:** New York; Essex Co., 0.75 mi E of Catlin Lake; 44°N, 74°15'W, Santanoni and Long Lake Quadrangles, USGS. **Continuity:** Established 1980. **Size:** 19.4 ha = 47.9 acres. **Description of Plot:** See AB 35: 64 (1981). An independent sample of vegetation taken in 1981 gave the following results: Trees 3 cm diameter and over, based on 50 0.1-acre circular samples, 486.6/acre; total basal area 157.3 ft²/acre. Species comprising at least 90% of the total number of trees: Dead trees, 200, 41, 21, 100; Beech (*Fagus grandifolia*), 127, 26, 18, 98; Red Spruce (*Picea rubens*), 63, 13, 8, 92; Sugar maple (*Acer saccharum*), 40, 8, 26, 88; Hemlock (*Tsuga canadensis*), 15, 3, 8, 58. Trees by diameter size class: S (3-8 cm) 263, 54, 6.8, 4; A (8-15 cm) 82, 17, 8.2, 5; B (15-23 cm) 43, 9, 12.9, 8; C (23-38 cm) 60, 12, 48, 31; D (38-53 cm) 30, 6, 52.5, 33; E (53-69 cm) 8, 2, 24.6, 16; F (69-84 cm) 0.2, 0.04, 1, 1; G (84-102 cm) 0.2, 0.04, 1.5, 1; H (> 102 cm) 0.2, 0.04, 1.8, 1. Shrub stems/acre 258; ground cover 48%; canopy cover 77%; average canopy height 18 m (range 5.5-30 m). **Weather:** Temperatures and precipitation normal throughout the period. **Coverage:** June 5, 8, 10-12, 18, 20, 25-26, 30, July 1; between dawn and 1130. Total man-hours: 45. **Census:** Red-eyed Vireo, 25.5 (132, 53); Least Flycatcher, 12.5 (64, 26); Am. Redstart, 12.5; Blackburnian Warbler, 11 (57, 23); Black-throated Blue Warbler, 7.5 (39, 16); Black-throated Green Warbler, 5.5 (28, 11); Swainson's Thrush, 5 (26, 10); Black-capped Chickadee, 3 (15, 6); Dark-eyed Junco, 3; Solitary Vireo, 2.5; Yellow-bellied Sapsucker, 2; Brown Creeper, 2; Yellow-rumped Warbler, 1.5; Hairy Woodpecker, 1; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Scarlet Tanager, 1; White-throated Sparrow, 1; E. Wood Pewee, 0.5. **Total:** 14 species; 50 territorial males (538/km², 218/100 acres). **Visitors:** Mourning Dove, Black-billed Cuckoo, Hairy Woodpecker, Downy Woodpecker, E. Kingbird, Acadian Flycatcher, Com. Crow, Fish Crow, Tufted Titmouse, White-breasted Nuthatch, Veery, Red-eyed Vireo, Prairie Warbler, Com. Yellowthroat, Red-winged Blackbird, Com. Grackle, Brown-headed Cowbird, Cardinal. **Remarks:** Nests found Rufous-sided Towhee, 2. The decline in number of species and territorial males noted over the past 3 years has reversed. Numbers of both this year are comparable to those in the first 2 years of the census (1977 and 1978). No noticeable habitat change has occurred within or near the plot.—*JAMES CLINTON, SR. (compiler), CLEVELAND DODGE, GILBERT RAYNOR and KATHLEEN TUOHY, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934*

56. SECOND-GROWTH OAK-PINE FOREST.

— **Location:** New York; Suffolk Co., Upton, near NE corner of Brookhaven Nat'l Laboratory property, 6000 ft S of State Rd 25; 40°53'16"N, 72°51'53"W, Wading River Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 9.3

ha = 22.97 acres. **Description of Plot:** See AB 33:69 (1979). **Weather:** May was warmer and drier than normal (mean temperature 58.3°F, 25-yr average 55.6°. Precipitation 2.17 in, 25-yr average 3.83 in.). June was warmer and wetter than normal (mean temperature 68.4°, 25-yr average 65.4°. Precipitation 3.14 in., 25-yr average 2.72 in.). Early July was cool with frequent showers. Weather on census trips varied from clear to overcast with light rain and fog. Temperatures 38-82°, wind speeds calm to 5 m/s but mostly light. **Coverage:** May 19, 21, 24, 27; June 2, 5, 8, 10, 16-17, 19, 24, 27, 30; July 3; 0545-0900 EDT. Total man-hours: 33. **Census:** Rufous-sided Towhee, 21.5 (231, 94); Ovenbird, 7.5 (81, 33); N Oriole, 5 (54, 22); Blue Jay, 3 (32, 13); Scarlet Tanager, 2.5; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Brown Thrasher, 2; Hermit Thrush, 1; Black-and-white Warbler, 1; Pine Warbler, 1; Com Flicker, 0.5; E. Wood Pewee, 0.5; Am Robin, 0.5. **Total:** 14 species; 50 territorial males (538/km², 218/100 acres). **Visitors:** Mourning Dove, Black-billed Cuckoo, Hairy Woodpecker, Downy Woodpecker, E. Kingbird, Acadian Flycatcher, Com. Crow, Fish Crow, Tufted Titmouse, White-breasted Nuthatch, Veery, Red-eyed Vireo, Prairie Warbler, Com. Yellowthroat, Red-winged Blackbird, Com. Grackle, Brown-headed Cowbird, Cardinal. **Remarks:** Nests found Rufous-sided Towhee, 2. The decline in number of species and territorial males noted over the past 3 years has reversed. Numbers of both this year are comparable to those in the first 2 years of the census (1977 and 1978). No noticeable habitat change has occurred within or near the plot.—*JAMES CLINTON, SR. (compiler), CLEVELAND DODGE, GILBERT RAYNOR and KATHLEEN TUOHY, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934*

57. 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:** Established 1977; 5 consecutive years. **Size:** 9.67 ha = 23.9 acres. **Description of Plot:** See AB 33:68 (1979). **Weather:** See Census 56. **Coverage:** May 5, 13, 18, 21, 24, June 1, 5-6, 8, 28; July 3-4; 0525-0820, EDT. Total man-hours: 25. **Census:** Rufous-sided Towhee, 19 (196, 79); Prairie Warbler, 16 (165, 67); Field Sparrow, 5 (52, 21); Brown Thrasher, 4 (41, 17); Com. Yellowthroat, 1. **Total:** 5 species; 45 territorial males (465/km², 188/100 acres). **Visitors:** Marsh Hawk, Mourning Dove, Black-billed Cuckoo, Whip-poor-will, Chimney Swift, Com Flicker, Great Crested Flycatcher, Tree Swallow, Barn Swallow, Blue Jay, Com Crow, Black-capped Chickadee, Mockingbird, Red-winged Blackbird, N. Oriole, Com. Grackle, Brown-headed Cowbird. **Remarks:** Nest found: Field Sparrow. Rufous-sided Towhee numbers were double those of 1980 and well above those of earlier years. Other species did not change significantly. No apparent habitat change occurred.—*ROBERT ADAMO, EDWARD KEMNITZER (compiler), GILBERT RAYNOR, AL and BARBARA SCHERZER, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934*.

58. UF⁺ AND MAPLE-HEMLOCK FOREST. — **Location:** New York; Albany Co., Town of Knox 0.4 mi S intersection of State Rt. 156 and Co. Rt. 254; 42°40'20"N, 74°07'00"W, Altanont Quadrangle, USGS. **Continuity:** New. **Size:** 10.64 ha = 26.29 acres (measured, grid). **Description of Plot:** The dominant canopy trees are Sugar Maple (*Acer saccharum*) and E. Hemlock (*Tsuga canadensis*). Most prominent in the under-story are Sugar Maple, blackberry and raspberry (*Rubus* sp.). The ground cover is primarily Sugar Maple. A quantitative survey of the vegetation gave the following results: Trees 3-in diameter and over, based on 6 circular 0.1 acre samples, 257/acre; total basal area 87 ft²/acre. Species comprising 90% of the total number of trees: Sugar Maple, 154, 59, 60, 83; Hemlock, 61, 23, 26, 67; Am. Hop Hornbeam (*Ostrya virginiana*), 3, 2, 1, 33; Black Birch (*Betula lenta*), 2, 1, 0, 17; White Ash (*Fraxinus americana*), 2, 1, 1, 17; dead trees, 35, 14, 12, 67. Trees by diameter size class: A (3-6 in.) 77, 30, 7.7, 6; B (6-9 in.) 64, 25, 19.2, 14; C (9-15 in.) 99, 39, 79.4, 57, D (15-21 in.) 13, 5, 23, 16; E (21-27 in.) 3, 1, 9.9, 7. Shrub stems/acre 9750; ground cover 88%; canopy cover 71%; average canopy height 76 ft (range 64-100). **Edge:** Similar forest on the S, brushlot buffered by 300 ft on the N, hay field on E and W buffered by at least 150 ft. **Topography:** Two-thirds relatively flat; 20 ft drop in elevation on E slope which runs from NE corner to center then to SE corner. **Elevation:** 1480-1500 ft. **Coverage:** May 8, 22; June 9, 11, 19, 30; July 10, 17; 0540-0907. Total man-hours: 20. **Census:** E. Wood Pewee, 10.5 (99, 40); Wood Thrush, 10 (94, 38); Red-eyed Vireo, 9 (85, 34); Ovenbird, 9; Black-throated Blue Warbler, 8 (75, 30); Brown headed Cowbird, 7 (66, 27); White-breasted Nuthatch, 5 (47, 19); Veery, 5; Scarlet Tanager, 5; Great Crested Flycatcher, 4 (38, 15); Yellow-bellied Sapsucker, 3.5 (33, 13); Blue Jay, 3 (28, 11); Am. Robin, 3; Downy Woodpecker, 2; Black-capped Chickadee, 1; Am. Redstart, 1; Ruffed Grouse, +. **Total:** 17 Species, 86 territorial males (808/km², 327/100 acres). **Visitors:** Broad-winged Hawk, House Wren, Solitary Vireo, Com. Yellowthroat, N. Oriole, Rose-breasted Grosbeak, Chipping Sparrow, Song Sparrow, **Remarks:** This 68-acre stand had 695 trees (210.8 MBF) harvested in 1979. A 30-ft wide mowed pipeline right-of-way cuts across the center of the plot. Three observations of a Ruffed Grouse brood were made, but no drumming had been heard during spring visits. Nests located: Wood Thrush, 1; E. Wood Pewee, 3.—*NATHAN T. TRIPP and ALAN MARTEL, NYSDEC, Rte 10, Stamford, NY 12167.*

59. UPLAND MIXED PINE-SPRUCE-HARDWOOD PLANTATION. — **Location:** New York; Allegany Co., on the S side of Brown Rd., Town of Ward, 3.5 mi W of Alfred, 42°37'30"N, 77°45'W; Andover Quadrangle, USGS. **Continuity:** Established 1974; 8 consecutive years. **Size:** 16.6 ha = 41 acres. **Description of Plot:** See AB 28: 699 (1974). **Weather:** Data provided by the Alfred Cooperative Weather Station indicated that average daily temperatures in May, June and July (53.4°F, 59.8°, 66.0°) were well within normal range. Precipitation during May and

June (2 55 in, 3 52 in) was normal but July rainfall totalled 6.53 in. which was higher than normal. Four days of sub-30° low temperatures in the first half of May and a bad windstorm on June 22 were the only weather factors that may have had a deleterious effect on nest success. **Coverage:** May 8, 20, 27; June 3, 9, 17, 24; July 3, 9, 17, 27; August 3, 12; 0625-2010, EDT. Total man-hours: 20. **Census:** Black-throated Green Warbler, 16 (96, 39); Blackburnian Warbler, 12 (72, 29); Magnolia Warbler, 10 (60, 24); Golden-crowned Kinglet, 5 (30, 12); Dark-eyed Junco, 5; Blue Jay, 4 (24, 10); Black-capped Chickadee, 4; Yellow-rumped Warbler, 4; Brown Creeper, 3 (18, 7); Am. Robin, 3; Red-breasted Nuthatch, 2; Wood Thrush, 2; Cedar Waxwing, 2; Ovenbird, 2; Com. Yellowthroat, 2; Brown-headed Cowbird (females), 2; Indigo Bunting, 2; Chipping Sparrow, 2; Downy Woodpecker, 1; House Wren, 1; Veery, 1; Solitary Vireo, 1; Nashville Warbler, 1; Canada Warbler, 1; Scarlet Tanager, 1; Cardinal, 1; Purple Finch, 1; White-throated Sparrow, 1; Song Sparrow, 1; Turkey, +; Barred Owl, +; Pileated Woodpecker, +; White-breasted Nuthatch, +; Red-eyed Vireo, +; Rose-breasted Grosbeak, +. **Total:** 35 species; 93 territorial males (560/km², 227/100 acres). **Remarks:** Nests found: Am. Robin, 1; House Wren, 1; White-throated Sparrow, 1. A Barred Owl with 2 young was seen on every June census. A treed Black Bear cub on the June 3 census provided reason for subsequent alertness! Appreciation to Gaylord Rough for weather data and to Reed Van Kaynor for assistance.—*ELIZABETH W. BROOKS, Waterwells Rd., Alfred Station, NY 14803.*

60. MIXED OAK-PINE FOREST I. — **Location:** Pennsylvania; Luzerne Co., 1.6 km NNE of Wapwallopen; 41°04'N, 76°07'W, Sybertsville Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 6 ha = 14.8 acres. **Description of Plot:** See AB 33: 70 (1979). **Weather:** May, 17% below average precipitation, otherwise near normal weather. During censuses, temperatures averaged 59°F (15°C) with light winds and variable (usually partly cloudy) skies. **Coverage:** Apr. 29; May 8, 18, 27; June 4, 10, 19, 24, 26; July 1-2, 10; 0430-0900, EST. Total man-hours: 36. **Census:** Black-capped Chickadee, 4.5 (75, 30); Scarlet Tanager, 4 (67, 27); Red-eyed Vireo, 3.5 (58, 24); Brown-headed Cowbird, 3.5; Ovenbird, 3 (50, 20); Blue Jay, 2.5; Yellow-billed Cuckoo, 2; Great Crested Flycatcher, 2; Wood Thrush, 2; Cedar Waxwing, 2; Black-and-white Warbler, 2; E. Wood Pewee, 1.5; Blue-gray Gnatcatcher, 1.5; Com. Flicker, 1; Tufted Titmouse, 1; Am. Robin, 1; Rose-breasted Grosbeak, 1; Hairy Woodpecker, 0.5; Downy Woodpecker, 0.5; Com. Crow, 0.5; White-breasted Nuthatch, 0.5; Rufous-sided Towhee, 0.5; Broad-winged Hawk, +; Ruffed Grouse, +; Pileated Woodpecker, +; Red-breasted Nuthatch, +; Indigo Bunting, +; Chipping Sparrow, +. **Total:** 28 species; 40.5 pairs (676/km², 274/100 acres). **Visitors:** Cooper's Hawk, Chimney Swift, Ruby-throated Hummingbird, Worm-eating Warbler, Orchard Oriole, Red-winged Blackbird, Com. Grackle, Cardinal. **Remarks:** The 1981 density and species number was the highest in 5 years. This resulted in part from more thor-

ough coverage and perhaps also to the effects of more gypsy moth defoliation. Overall, approximately 40% of the tree foliage was destroyed by gypsy moth. Oaks, especially *Quercus velutina*, *Q. prinus*, and *Q. alba*, were hit very hard with almost all foliage consumed. Nests found (1 each): Black-capped Chickadee, Wood Thrush, Red-eyed Vireo, Black-and-white Warbler, Scarlet Tanager. In addition, young Great Crested Flycatcher, Blue Jay, Blue-gray Gnatcatcher, Indigo Bunting, Rufous-sided Towhee, and Chipping Sparrow were observed. Cedar Waxwing was a new breeding species. J.D. Montgomery and D.G. Richie assisted with the gypsy moth defoliation study. This census is part of a study supported by the Pennsylvania Power and Light Company.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603*

61. MIXED OAK-PINE FOREST II. — **Location:** Pennsylvania; Luzerne Co., 3.4 km NE of Beach Haven and 2.8 km NW of Wapwallopen; 41°05'N, 76°07'W, Berwick Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 11.05 ha = 27.3 acres. **Description of Plot:** See AB 33 70 (1979). **Weather:** Like Mixed Oak-Pine Forest I, but with mean temperature during censuses 60°F (16°C) and cloud cover typically overcast, sometimes foggy near dawn. **Coverage:** May 1, 12, 19, 28; June 3, 5, 16-17, 23; July 3, 7-8, 16, 0430-0930, EST. Total man-hours: 45. **Census:** Rose-breasted Grosbeak, 6 (54, 22); Blue Jay, 5 (45, 18); Brown-headed Cowbird, 5; Wood Thrush, 4.5 (41, 16); Scarlet Tanager, 4.5; Black-capped Chickadee, 3.5 (32, 13); Tufted Titmouse, 3.5; Red-eyed Vireo, 3 (27, 11); E. Wood Pewee, 2; Am. Robin, 2; Ovenbird, 2; Yellow-billed Cuckoo, 1.5; Downy Woodpecker, 1.5; Hooded Warbler, 1.5; Rufous-sided Towhee, 1.5; Com. Flicker, 1; Brown Creeper, 1; Gray Catbird, 1; Cedar Waxwing, 1; Black-and-white Warbler, 1; Cardinal, 1; Great Crested Flycatcher, 0.5; White-breasted Nuthatch, 0.5; N. Oriole, 0.5; Hairy Woodpecker, +; House Wren, +; Blue-gray Gnatcatcher, +; Veery, +; Chestnut-sided Warbler, +; Com. Yellowthroat, +; Am. Redstart, +. **Total:** 31 species; 54.5 pairs (493/km², 200/100 acres). **Visitors:** Sharp-shinned Hawk, Red-tailed Hawk, Broad-winged Hawk, Ruffed Grouse, Mourning Dove, Black-billed Cuckoo, Com. Crow, Worm-eating Warbler, Blue-winged Warbler, Com. Grackle, House Finch, Am. Goldfinch, Chipping Sparrow. **Remarks:** There was an overall increase for the fourth straight year to a level 48% higher than 1977. Rose-breasted Grosbeak population was twice that of any previous year. Gypsy moth caterpillars destroyed approximately 20% of the tree foliage in the plot. Most of this defoliation occurred on *Quercus velutina*, *Q. prinus*, and *Q. alba*. Nests found: Yellow-billed Cuckoo, 1; Blue Jay, 2; Am. robin, 1; Wood Thrush, 2; Red-eyed Vireo, 1; Rose-breasted Grosbeak, 2. In addition, young creepers and orioles were observed. J.D. Montgomery and D.G. Richie assisted with the gypsy moth defoliation study. This census is part of a study supported by the Pennsylvania Power and Light Company.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603*

62. CENTRAL HARDWOOD FOREST WITH SCATTERED PINE. — **Location:** Washington, D.C., Rock Creek Park, lying S of Military Rd and W of Rock Creek; 38°57'30"N, 77°2'40"W, Washington W Quadrangle, USGS. **Continuity:** Established 1948, 24 intermittent years. **Size:** Until 1961, 80 acres; Since 1961, 26.3 ha = 65 acres. **Description of Plot:** See AFN 2:153-154 (1948) **Weather:** Temperatures averaged: April 64°F; May, 61°; June, 72°; July 65°. Weather was in general clear, and record-breaking heat did not set in until the latter part of July. **Coverage:** Apr. 3, 5, 17, 24; May 3, 14, 22, 29; June 4, 14, 18, 25; July 5, 9, 16; 0500-0930, EST. Total man-hours: 26.5. **Census:** Red-eyed Vireo, 5 (19, 8); Carolina Chickadee, 4 (15, 6); Tufted Titmouse, 4; Blue Jay, 3.5 (13, 5); White-breasted Nuthatch, 3.5; Carolina Wren, 3.5; Wood Thrush, 3.5; Red-bellied Woodpecker, 3 (11, 5), E Wood Pewee, 2.5; Com. Flicker, 2; Downy Woodpecker, 2; Veery, 2; Scarlet Tanager, 1.5; Great-Crested Flycatcher, 1; E Phoebe, 1; Worm-eating Warbler, 1; Ovenbird, 1; Com. Grackle, 1; Cardinal, 1; Com Crow, 0.5; Broad-winged Hawk, +; Brown-headed Cowbird, +; Rufous-sided Towhee, +. **Total:** 23 species; 46.5 territorial males ($177/\text{km}^2$, 72/100 acres). Nest located: E Phoebe. **Visitors:** Yellow-billed Cuckoo, Pileated Woodpecker, Mockingbird, Am. Robin, large numbers of Cedar Waxwings, Starlings, Com. Grackles, and Am. Goldfinches attracted by a caterpillar infestation. **Remarks:** An infestation of Forest Tent Caterpillars and Fall Cankerworms (the most numerous) occurred from late April until early June. Trees, mostly oaks, were 5% to 50% defoliated, some even 100%. The area of greatest defoliation covered about ten acres in the N third of the plot. From approximately May 13-16 this infested area attracted numerous birds which came in for food only. Defoliation did not radically change the nesting pattern except that a Wood Thrush and a Great Crested Flycatcher territory, both outside the plot in 1980, were added within the affected area. The number of species at 23 is higher than in recent years. The Worm-eating Warbler had not nested here before. Another addition was the Carolina Wren, returning after dropping to zero after the hard winter of 1977. The total of 46.5 territories is lower than the 61 for 1979 but higher than the 25 for 1980, probably because of better coverage, with 15 trips and 26.5 hours in 1981, compared with 10 trips and 18 hours in 1980. However, the total number of territories is continually dropping, as reported previously, because of a reduction of vireos, warblers, flycatchers, Veeries, and Wood Thrushes.—ROBERT FORD, JOAN CRISWELL (compiler), 3519 Jermantown Road, Fairfax, VA 22303.

63. WHITE PINE-OAK FOREST. — **Location:** West Virginia; Greenbrier Co.; ½ m W of Anthony Creek Road on Big Draft Road. The centerline starts at 37°54'5"N, 80°15'11"W, Anthony Quadrangle, USGS and extends N. **Continuity:** Established 1966; 3 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Previously published as Relatively Mature Pine-Oak Forest, Big Draft Study Area. See AFN 20:627-628

(1966) AB 25 1013-1014 (1971) The dominant canopy trees are White Pine (*Pinus strobus*) and Black Oak (*Quercus velutina*). Most prominent in the understory are Witch Hazel (*Hamamelis virginiana*) and Dogwood (*Cornus florida*). The ground cover is primarily New York Fern (*Dryopteris noveboracensis*) and Black Cohosh (*Cimicifuga racemosa*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 221/acre; total basal area 106 ft²/acre. Species comprising 90% of the total number of trees: White Pine 30, 13.5, 38.8, 83; Black Oak 22, 9.7, 17, 66; Red Maple (*Acer rubrum*), 38, 17, 11, 100; White Oak (*Q. alba*), 35, 15.7, 9.5, 66; Tulip-tree (*Liriodendron tulipifera*), 22, 9.7, 9.2, 66; Cucumber tree (*Magnolia acuminata*), 33, 1.5, 3, 33; Pignut Hickory (*Carya glabra*), 10, 4.5, 2.6, 50. Trees by diameter size class: A (3-in.) 120, 54, 12, 11; B (6.9-in.) 43, 20, 13, 12; C (9.15-in.) 38, 17, 30, 29; D (15.21-in.) 13, 6, 24, 22; E (21.27-in.) 3, 1.5, 10, 9.7; F (27.33-in.) 3, 1.5, 16, 15. Shrub stems/acre 7333; ground cover 9%; canopy cover 85%; average canopy height 86 ft (range 46-117). **Edge:** One edge is near a state highway and the other is a cut-over area (cut between 1966 & 1971). **Topography:** Nearly level. Elevation: 2500 ft. **Weather:** Rain every day, partly cloudy for late morning trips. **Coverage:** May 30-June 4. Eleven trips between dawn and 0700, EST; 4 late a.m. and 2 late p.m. trips. Total party-hours: 8.6. **Census:** Red-eyed Vireo, 6 (99, 40); Ovenbird, 4.5 (74, 30); Golden-winged Warbler, 2.5; Black-capped Chickadee, 2; Gray Catbird, 2; Chestnut-sided Warbler, 2; Hooded Warbler, 2; Indigo Bunting, 2; Rufous-sided Towhee, 2; Wood Thrush, 1.5; Black-and-white Warbler, 1.5; Hairy Woodpecker, 1; Scarlet Tanager, 1; Great Crested Flycatcher, 0.5; Turkey Vulture, +; Broad-winged Hawk, +; Whip-poor-will, +; Pileated Woodpecker, +; Blue Jay, +; Com. Raven, +; Com. Crow, +; Tufted Titmouse, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 24 species; 30.5 territorial males ($502/\text{km}^2$, 203/100 acres). **Visitors:** Yellow-billed Cuckoo, Black-billed Cuckoo, Com. Flicker, Downy Woodpecker, E. Phoebe, Worm-eating Warbler. **Remarks:** Nests located: Hairy Woodpecker, 1; Chestnut-sided Warbler, 1. In 1966 there were 45 territorial males of 19 species. Five years later (1971), after about 40% of the area was clear-cut, there were only 20 territorial males of 22 species. Now the E side of the plot is brushy and thus suitable to the Golden-winged Warbler, Chestnut-sided Warbler, and Indigo Bunting while the W side provided habitat for the Red-eyed Vireo and Ovenbird because of the larger, more mature trees. Special thanks to George Koch, Glen Phillips and members of the Brooks Bird Club for help.—JOE and BILL KINNEY, HARRIET HOOKER, JOHN JONES, JAY BUCKELOW, and JIM PHILLIPS (compiler), 809 Thorn St., Princeton, WV 24740.

64. MOUNTAIN TOP HABITAT. — **Location:** Virginia; Augusta Co., 6000 ft SW of Reddish Knob; 38°27'N, 79°15'W; Palo Alto Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660

yds, measured longitudinally and estimated laterally). **Description of Plot:** The hunters' access road to Little Bald Knob separates the plot on its long N-S axis. Soil fertility is very poor. Two small springs are present. The dominant canopy trees are Virginia Pine (*Pinus virginiana*) and Red Maple (*Acer rubrum*). Most prominent in the understory are Mountain Laurel (*Kalmia latifolia*) and Fetterbush (*Leucothoe editorum*). The ground cover is primarily Turkey Beard (*Xerophyllum asphodeloides*), Teaberry (*Gaultheria procumbens*) and several species of mosses. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 0.1 acre samples, 484/acre; total basal area 140 ft²/acre. Species comprising 94% of the total number of trees: Virginia Pine, 115, 24, 23.4, 83; Pitch Pine, (*P. rigida*), 70, 14, 15.3, 50; Red Oak (*Quercus rubra*), 22, 4, 13.6, 66; Chestnut Oak (*Q. prinus*), 17, 4, 10.7, 66; Red Maple, 105, 22, 10.3, 100; Black Birch (*Betula lenta*), 42, 9, 6.3, 100; E. Hemlock (*Tsuga canadensis*), 20, 4, 4.5, 83; dead tres, 37, 7, 3.9, 100, Black Gum (*Nyssa sylvatica*), 28, 6, 2.7, 50. Trees by diameter size class: A (3-in.) 256, 53, 19.6, 14; B (6.9-in.) 160, 33, 48, 34; C (9.15-in.) 50, 10, 40, 29; D (15.21-in.) 15, 3, 27, 19, E (21.27-in.) 1, 0, 5.2, 4. Shrub stems/acre 49,666; ground cover 33%; canopy cover 78%; average canopy height 32 ft (range 25-42). **Edge:** Similar vegetation to plot. **Topography:** A mountain top ridge with a slope to the W falling about 50 ft. **Elevation:** 3845 ft. **Coverage:** May 29; June 2-4, 6-7, 12, 14-15, 22, 26, between dawn and 1300 hours or 1955-2110 hours. Total man-hours: 9. **Census:** Canada Warbler, 7 (115, 47); Rufous-sided Towhee, 4 (66, 27); Black-throated Blue Warbler, 2; Veery, 1.5; Black-capped Chickadee, 1; Great Crested Flycatcher, 0.5, Pileated Woodpecker, +; Dark-eyed Junco, +; Red-eyed Vireo, +. **Total:** 9 species; 16 territorial males ($264/\text{km}^2$, 107/100 acres) **Visitors:** Broad-winged Hawk, Great Horned Owl, Barred Owl, Blue Jay, Com. Raven, and Cedar Waxwing. **Remarks:** The most striking feature was the unusually dense shrub layer. Thanks to Kathleen and Michael Finnegan for their help and to Ellen Goetz, Clair Mellinger, Ann Zimmerman, and Sharon Wubben for assistance with the vegetative survey.—ELWOOD FISHER and CHARLES ZIEGENFUS, Mathematics & Computer Science Dept., James Madison Univ., Harrisonburg, VA 22807.

BREEDING BIRDS OF FORESTED STREAM GORGES IN THE BARABOO HILLS, WISCONSIN

The following 4 censuses were undertaken in 1977, each in a separate stream gorge within the Baraboo Hills. This range is composed of quartzite with some overlying sandstone, and contains conifer relics and the largest tracts of unbroken hardwood forest in southern Wisconsin; it extends a distance of 40 km and rises to an elevation of 445 m (1460 ft), approximately 150 m (500 ft) above the surrounding agricultural lands. The area contains a mixture of northern and southern breeding bird species more characteristic of the Appalachian Mountains than of Wisconsin.

The 4 study areas contain nearly all forest types occurring within the Baraboo Hills. All 4 gorges open onto agricultural lands to the south, but are otherwise surrounded by hardwood forest. Study boundaries were established 80 m to either side of the stream bottom, and each area was 19.4 ha, or ca 1.2 km long. Vegetation measurements are from 96 (0.04-ha) circular quadrats in each gorge, using a modified James and Shugart (AFN 24: 727-736 (1970) method. Understory stems include all woody vegetation and ferns > 0.5 m tall and < 10 cm dbh. In each quadrat I estimated the per cent cover of protruding rocks using 4 cover classes, and recorded the presence or absence of cliffs > 1.5 m tall and trees which emerged < 3 m above the main canopy; emergent trees were not included in canopy height measurements. Tree species importance values were calculated by the formula: 1/3 (relative density + relative frequency + relative dominance). Understory species importance values were calculated by the formula: 2/3 relative density + 1/3 relative frequency. Special thanks to the Univ. of Wisc. Dept. of Wildlife Ecology, The Nature Conservancy, Dennis Shipman, and Penny and John Mossman.—MICHAEL MOSSMAN, 1810 Schlimgen Ave., Madison, WI 53704.

65. FORESTED STREAM GORGE I.—
Location: Wisconsin; Sauk Co., Baraboo Hills, Pine Glen, T11N R6E S.35 N½; 43°23'N, 89°45'W, Baraboo and North Freedom Quadrangles, USGS. **Continuity:** New (1977). **Size:** 19.4 ha = 47.9 acres. **Description of Plot:** Dry, rocky gorge with talus and many quartzite cliffs in lower end. White Pine scattered throughout. Importance values for canopy: Red Oak (*Quercus borealis*) 23, White Pine (*Pinus strobus*) 15, Red Maple (*Acer rubrum*) 13, White Oak (*Q. alba*) 10, Basswood (*Tilia americana*) 9, Black Oak (*Q. velutina*) 6, Bigtooth Aspen (*Populus grandidentata*) 5, White Ash (*Fraxinus americana*) 3, Ironwood (*Ostrya virginiana*) 3, Butternut (*Juglans cinerea*) 3, Shagbark Hickory (*Carya ovata*) 3; continuum index 548; live trees/ha 504; basal area/ha 2578 dm²; dead trees/ha 56. Importance values for understory: Maple-leaved Viburnum (*Viburnum acerifolium*) 12, Ironwood 12, Witchhazel (*Hamamelis virginiana*) 10, Musclewood (*Carpinus caroliniana*) 6, Mountain Maple (*A. spicatum*) 6, Red Maple 5, White Ash 5, Beaked Hazel (*Corylus cornuta*) 3, Huckleberry (*Gaylussacia baccata*) 3, Red Oak 3; understory stems/ha 10,039. Other: canopy cover 62%; ground cover 42%; mean canopy ht 19.8 m (range 6-30); cliffs (freq) 36%; emergent trees (freq) 20%; rock cover 48%. **Topography:** Relief between stream bottom and side boundaries varies from 7 to 52 m. **Coverage:** May 8, 13, 22, 27; June 8, 20, 25; July 13; Aug. 4, 14; Sept 12. Total man-hours: 33. **Census:** Rose-breasted Grosbeak, 11 (57, 23); Blue Jay, 7 (36, 15); Scarlet Tanager, 7; Wood Thrush, 6 (31, 13); E. Wood Pewee, 5 (26, 10); Brown-headed Cowbird, 5; Red-bellied Woodpecker, 3 (15, 6), Downy Woodpecker, 3; Great Crested Flycatcher, 3; Black-capped Chickadee, 3; White-breasted Nuthatch, 3; Am. Robin, 3; Louisiana Waterthrush, 3; N. Oriole, 3; Com. Flicker, 2; Red-eyed Vireo, 2; Indigo

Bunting, 2, Mourning Dove, 1, Barred Owl, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Acadian Flycatcher, 1; Gray Catbird, 1; Veery, 1; Cedar Waxwing, 1; Goshawk, +; Cooper's Hawk, +; Red-tailed Hawk, +; Ruffed Grouse, +; Am. Woodcock, +; Ruby-throated Hummingbird, +; Red-headed Woodpecker, +; Com. Crow, +; Blue-gray Gnatcatcher, +; Yellow-throated Vireo, +; Cardinal, +; Am. Goldfinch, +. **Total:** 38 species; 80 territorial males (413/km², 167/100 acres). **Remarks:** Nests found: Red-bellied Woodpecker, Acadian Flycatcher, Blue Jay, Black-capped Chickadee, Wood Thrush, Louisiana Waterthrush, Scarlet Tanager, Cardinal, Rose-breasted Grosbeak; young Barred Owls and crows food begging; Blue Jay fledglings.

males (655/km², 265/100 acres) **Remarks:** Nests found: Red-tailed Hawk, Hairy Woodpecker, E. Phoebe, Acadian Flycatcher, E. Wood. Pewee, Black-capped Chickadee, Gray Catbird, Am. Robin, Wood Thrush, Veery, Blue-gray Gnatcatcher, Red-eyed Vireo, Blue-winged Warbler, Louisiana Waterthrush, Scarlet Tanager, Cardinal, Rose-breasted Grosbeak; young Barred Owls and crows food begging; Blue Jay fledglings.

67. FORESTED STREAM GORGE III.—

Location: Wisconsin; Sauk Co., Baraboo Hills. Baxter's Hollow, T11N R6E S.32E ¼, S.33 W ¼; 43°23'N, 89°48'W, North Freedom Quadrangle, USGS. **Continuity:** New (1977). **Size:** 19.4 ha = 47.9 acres. **Description of Plot:** Mesic hollow with low relief and no cliffs or conifers. Vegetation relatively homogeneous with many pole-sized maples and basswoods, larger oaks evidently logged ca 1950. One hectare of area logged selectively, ca 1975. Importance values for canopy: Sugar Maple 22, Basswood 13, Red Maple 12, Red Oak 10, White Oak 10, Bigtooth Aspen 10, Yellowbud Hickory (*Carya cordiformis*) 4, Shagbark Hickory 4, White Ash 3, Black Ash 3; continuum index 671; live trees/ha 679; basal area/ha 2514 dm²; dead trees/ha 57. Importance values for understory: Musclewood 22, Maple-leaved Viburnum 11, Sugar Maple 11, Ironwood 8, Interrupted Fern (*Osmunda claytoniana*) 7, Basswood 5, Witchhazel 4, Lady Fern (*Athyrium spp.*) 4, White Ash 3, Yellowbud Hickory 3; understory stems/ha 10,237. Other: canopy cover 76%; ground cover 51%; mean canopy ht 22.3 m (range 16-29); cliffs (freq) 0%; emergent trees (freq) 1%; rock cover 15%. **Topography:** Relief between stream bottom and side boundaries varies from 3 to 7 m. **Coverage:** May 6, 17, 24, 29; June 9, 21; July 2, 14; Aug. 1, 9, 25. Total man-hours: 33. **Census:** Least Flycatcher, 32 (165, 67); Ovenbird, 22 (113, 46); Red-eyed Vireo, 17 (88, 35); Acadian Flycatcher, 13 (67, 27); Blue-gray Gnatcatcher, 11 (57, 23); Scarlet Tanager, 8 (41, 17); Veery, 7 (36, 15), Brown-headed Cowbird, 7; Wood Thrush, 6 (31, 13); Rose-breasted Grosbeak, 6; E. Wood Pewee, 5 (26, 10); Am. Robin, 5; Louisiana Waterthrush, 4 (21, 8); Black-capped Chickadee, 3 (15, 6); Ruffed Grouse, 2, Ruby-throated Hummingbird, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2, White-breasted Nuthatch, 2; Cerulean Warbler, 2; Am. Goldfinch, 2; Am. Woodcock, 1, Hairy Woodpecker, 1; Blue Jay, 1; Tufted Titmouse, 1; Yellow-throated Vireo, 1, Cardinal, 1; Cooper's Hawk, +; Broad-winged Hawk, +; Black-billed Cuckoo, +; Barred Owl, +; Com. Flicker, +; Pileated Woodpecker, +; Red-headed Woodpecker, +; Great Crested Flycatcher, +; Cedar Waxwing, +; Blue-winged Warbler, +; Am. Redstart, +; N. Oriole, +. **Total:** 39 species, 166 territorial males (856/km², 347/100 acres). **Remarks:** Nests found: Hairy Woodpecker (1978), Acadian Flycatcher, Least Flycatcher, E. Wood Pewee, Black-capped Chickadee, Am. Robin, Wood Thrush, Veery, Blue-gray Gnatcatcher, Red-eyed Vireo, Ovenbird, Louisiana Waterthrush, Scarlet Tanager, Rose-breasted Grosbeak, hummingbird feeding fledgling.

68. FORESTED STREAM GORGE IV. — **Location:** Wisconsin, Sauk Co., Baraboo Hills Pine Hollow, T10N R5E S.4 SE, NW and NW, SW; 43°21'N, 89°54'W, Black Hawk Quadrangle, USGS. **Continuity:** New. **Size:** 19.4 ha = 47.9 acres. **Description of plot:** Y-shaped gorge, the lower 2/3 with sandstone and conglomerate cliffs, dense stands of Hemlock, and Yellow Birch. Less Hemlock, more oaks upstream and on upper slopes. White Pine scattered throughout. Importance values for canopy: Hemlock (*Tsuga canadensis*) 21, White Oak 14, Red Oak 11, Red Maple 10, Sugar Maple 10, Yellow Birch 9, Basswood 6, White Pine 6; continuum index 676; live trees/ha 513; basal area/ha 3001 dm²; dead trees/ha 31. Importance values for understory: Witchhazel 13, Sugar Maple 13, Ironwood 8, Maple-leaved Viburnum 8, Lady Fern 6, Muscleywood 5, White Ash 4, Red Maple 4; understory stems/ha 4927. Other: canopy cover 76%; ground cover 37%; mean canopy ht 23.1 m (range 12-34), cliffs (freq) 21%; emergent trees (freq) 7%, rock cover 25%. **Topography:** Relief between stream bottom and side boundaries varies from 15 to 33 m. **Coverage:** May 3, 10, 15, 28, June 7, 13, 27; July 7, 20; Aug. 10, 29. Total man-hours: 33. **Census:** Acadian Flycatcher, 18 (93, 38); Least Flycatcher, 18; Red-eyed Vireo, 18; Scarlet Tanager, 10 (52, 21); Rose-breasted Grosbeak, 9 (46, 19); E. Wood Pewee, 8 (41, 17); Blue-gray Gnatcatcher, 8; Brown-headed Cowbird, 8; Ovenbird, 7 (36, 15); Wood Thrush, 5 (26, 10); Black-capped Chickadee, 4 (21, 8); Magnolia Warbler, 4; Canada Warbler, 4; Cardinal, 4; E. Phoebe, 3 (15, 6); White-breasted Nuthatch, 3; Veery, 3; Yellow-throated Vireo, 3; Louisiana Waterthrush, 3; Am. Goldfinch, 3; Ruby-throated Hummingbird, 2; Hairy Woodpecker, 2; Blue Jay, 2; Cerulean Warbler, 2; Barred Owl, 1; Downy Woodpecker, 1; Am. Robin, 1; Blackburnian Warbler, 1; Red-shouldered Hawk, +; Red-tailed Hawk, +; Ruffed Grouse, +; Am. Woodcock, +; Yellow-billed Cuckoo, +; Whip-poor-will, +; Com. Flicker, +; Pleated Woodpecker, +; Red-bellied Woodpecker, +; Red-headed Woodpecker, +; Great Crested Flycatcher, +; Tufted Titmouse, +; Cedar Waxwing, +; Worm-eating Warbler, +; N. Oriole, +. **Total:** 43 species; 155 territorial males (800/km², 324/100 acres). **Remarks:** Nests found: E. Phoebe, Acadian Flycatcher, Least Flycatcher, E. Wood Pewee, Wood Thrush, Blue-gray Gnatcatcher, Yellow-throated Vireo, Red-eyed Vireo, Ovenbird, Louisiana Waterthrush.

69. MATURE ASPEN-FIR. — **Location:** Minnesota, Cass Co., Chippewa Nat'l Forest SW 1/4 of SE 1/4, Sec. 10, T144N, R30W; 47°17'30"N, 94°22'30"W; Sucker Lakes Quadrangle, USGS. **Continuity:** New. **Size:** 11.2 ha = 27.6 acres. **Description of Plot:** The Quaking Aspen (*Populus tremuloides*) averages 70 ft with a sub-canopy of Balsam Fir (*Abies balsamea*) 40-55 ft high. There are scattered Green Ash (*Fraxinus pennsylvanica*) along the intermittent stream beds. The ground cover consists primarily of litter with Wild Sarsaparilla (*Aralia nudicaulis*), Wild Ginger (*Asarum canadense*), and various hardwood seedlings as the most common

ground vegetation. **Edge:** Bordered on N, E, and S by similar vegetation. The W edge is a gravel road. **Topography:** Essentially flat with a gradual slope to E. **Elevation:** 1320-1330 ft. **Weather:** Warm, calm, and humid first 2 days; mild, breezy, and partly cloudy other days. **Coverage:** June 2-3, 15-16, 30; July 1; 0500-1100. Total man-hours: 18. **Census:** Ovenbird, 7.5 (67, 27); Black-throated Green Warbler, 3 (27, 11); Red-breasted Nuthatch, 2.5; Red-eyed Vireo, 2; Blue Jay, 1; Brown Creeper, 1; Veery, 1; Scarlet Tanager, 1; Broad-winged Hawk, 0.5; Black-capped Chickadee, 0.5; Hairy Woodpecker, +; E. Wood Pewee, +; Brown-headed Cowbird, +; Evening Grosbeak, +. **Total:** 14 species; 20 territorial males (179/km², 72/100 acres). **Remarks:** Nests found: Ovenbird, 2; Broad-winged Hawk, 1.—DON RAKSTAD and JOHN R. PROBST, N. Central Forest Experiment Station, USDA Forest Service, St. Paul, MN 55108.

70. MIXED SUCCESSIONAL ASPEN-OAK-CONIFER FOREST. — **Location:** Minnesota; Clearwater Co., 3.5 mi NW of intersection of state highway 200 and U.S. highway 71; 0.25 mi E of Univ. of Minnesota Forestry and Biological Station, Itasca State Park; 47°10'N, 95°12'W, Lake Itasca Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 8.93 ha = 22.07 acres. **Description of Plot:** See AB 35: 66-67 (1981). **Coverage:** July 2, 4, 7-9, 12-13; 0500-0700 and 1900-2100. Total man-hours: 32. **Weather:** June was very rainy. The first 5 censuses were in the high 80-90s F; the last 3 had average temperatures. **Census:** Ovenbird, 18.5 (207, 84); Chestnut-sided Warbler, 10 (112, 45); Com. Yellowthroat, 10; Veery, 6 (67, 27); Red-eyed Vireo, 5.5 (62, 25); Nashville Warbler, 5.5; Yellow-bellied Sapsucker, 3 (34, 14); Great Crested Flycatcher, 3; Black-capped Chickadee, 2.5; Song Sparrow, 1.5; Mourning Warbler, 1; Indigo Bunting, 1; Chipping Sparrow, 1; Swamp Sparrow, 1; Cedar Waxwing, 0.5; Am. Goldfinch, 0.5. **Total:** 16 species; 70.5 territorial males (789/km², 319/100 acres). **Visitors:** Broad-winged Hawk, Ruffed Grouse, Barred Owl, Ruby-throated Hummingbird, Com. Flicker, Pleated Woodpecker, Hairy Woodpecker, E. Phoebe, Olive-sided Flycatcher, Blue Jay, Com. Crow, White-breasted Nuthatch, Red-breasted Nuthatch, Gray Catbird, Am. Robin, Golden-crowned Kinglet, Golden-winged Warbler, N. Parula; Blackburnian Warbler, Red-winged Blackbird, Brewer's Blackbird, Brown-headed Cowbird, Rose-breasted Grosbeak. **Remarks:** The water level in the Sedge Marsh was higher than last year by about ½ ft. The number of territorial males was practically identical to last year's value (71.5). Two Yellow-bellied Sapsucker nests were found. The census was done late in the breeding season for most species present, thus possibly biasing our numbers for breeding birds downward. The Icterids and Corvids had already begun to form flocks, making it impossible to gather any territorial information for those species.—ROBERT J. BUEK and LISA C. MUELLER, 4909 Beehner Cir., Madison, WI 53714.

71. MIXED PINE-DECIDUOUS FOREST. — **Location:** Louisiana; Natchitoches Par., 1

mi W of the Northwestern State Univ. campus, within the Natural History Area, on the S side of La. Rt 6, 31°44'N, 93°06'W; Provençal Quadrangle, USGS. **Continuity:** New. **Size:** 8.9 ha = 22 acres (L-shaped, measured by pacing with compass). **Description of Plot:** See AB 25: 639-640 (1971) and 26: 699 (1972). **Weather:** During the 18-day period temperatures ranged from 78-95°F with 6 count days 80° or higher. Night lows were 62-78°; 4 days were mostly cloudy and 4 were mostly sunny to sunny. Wind was moderate to calm. **Coverage:** June 9, 13-14, 16, 18-19, 22, 26, 0730-1000. **Census:** Cardinal, 8 (90, 36); White-eyed Vireo, 7 (79, 32); Blue Jay, 5; Carolina Chickadee, 5 (56, 23); Carolina Wren, 4 (45, 18); Tufted Titmouse 3; Mockingbird, 3 (34, 14); Pileated Woodpecker, 2; Am. Robin, 2; Red-eyed Vireo, 2; N. Parula, 1; Hooded Warbler, 2; Red-headed Woodpecker, 1; Wood Thrush, 1; Swainson's Warbler, 1; Sharp-shinned Hawk, +; Yellow-billed Cuckoo, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Com. Crow, +; Yellow-breasted Chat, +. **Total:** 21 species, 47 territorial males (528/km², 214/100 acres).—ELLEN M. KRUK and CHARLIE VIERS Dept. of Biological Sciences, Northwestern State Univ. of La., Natchitoches, LA 71457.

72. 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; 4 intermittent years. **Size:** 3.2 ha = 8 acres. **Description of Plot:** See AB 32: 72 (1978). **Weather:** July 9-18. Temperatures and precipitation slightly above normal, range 48-86°F (8.9-30°C); mean daily min temp. 54.5° (17.5°), mean daily max. temp 79.4° (26.3°). Total rain 0.84 in. (2.1 cm). **Coverage:** July 9-18; 0430-2000, EST. Total man-hours: 6. **Census:** Magnolia Warbler, 6 (185, 75); Black-throated Green Warbler, 5 (154, 63); Am. Redstart, 4.5 (139, 56); White-throated Sparrow, 3 (93, 38); Black-capped Chickadee, 2 (62-65); Dark-eyed Junco, 2; Winter Wren, 1.5; Cedar Waxwing, 1.5; Black-and-white Warbler, 1.5; Nashville Warbler, 1.5; Blue Jay, 1; Red-breasted Nuthatch, 1; Am. Robin, 1; Swainson's Thrush, 1; N. Parula, 1; Olive-sided Flycatcher, +; Boreal Chickadee, +; Tennessee Warbler, +; Yellow-rumped Warbler, +; Ovenbird, +. **Total:** 20 species; 33.5 territorial males (1035/km², 419/100 acres). **Visitors:** Com. Flicker, Downy Woodpecker, E. Kingbird; Com. Crow; Starling, E. Wood Pewee, Pine Siskin, White-winged Crossbill. **Remarks:** Because of lateness of coverage, some species may have been classified as visitors rather than residents.—KENNETH L. CROWELL, Sunset, ME 04683.

73. RED PINE PLANTATION. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris; 41°42'30"N, 73°10'W, Litchfield Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AB 33: 72 (1979). **Coverage:** Apr. 9, June 2-5, 7, 10. Total man-hours: 11. **Census:** Com. Yellowthroat, 7 (82, 33); Song Sparrow, 6 (71, 29); Gray Catbird, 5 (59, 24); Blue-winged Warbler, 5; Chestnut-sided Warbler, 5; Rufous-sided Towhee, 5; N. Oriole, 4.5

(53, 21), Red-eyed Vireo, 4 (47, 19), Rose-breasted Grosbeak, 4; Black-capped Chickadee, 3.5 (41, 17); House Wren, 3.5; Am. Robin, 3 (35, 14); Veery 3; Blue-gray Gnatcatcher, 3; Black-and-white Warbler, 3; Am. Redstart, 3; Brown-headed Cowbird, 3; White-throated Sparrow, 3; Great Crested Flycatcher, 2; Blue Jay, 2; Wood Thrush, 2; Scarlet Tanager, 1.5; Black-billed Cuckoo, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Phoebe, 1; Least Flycatcher, 1; Red-breasted Nuthatch, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Canada Warbler, 1; Cardinal, 1; Indigo Bunting, 1; Barred Owl, 0.5; Red-tailed Hawk, +; Broad-winged Hawk, +; Am. Kestrel, +; Ruffed Grouse, +; Yellow-bellied Sapsucker, +; Com. Crow, +; Tufted Titmouse, +; White-breasted Nuthatch, +. **Total:** 43 species; 93.5 territorial males ($1100/\text{km}^2$, 445/100 acres). **Remarks:** In 1979, after the winter removal of all but a quarter-acre of Red Pine, the dominant over-story tree, 1978 figures plummeted to 31 species and 42.5 territorial males from 34 species and 87.5 territorial males. A year later, the growth of underbrush and saplings resulted in a partial recovery with 39 species and 66.5 territorial males. This year the increase continued, even surpassing the original census on the uncut plot by 9 species and 6 territorial males. Some species such as the Blackburnian Warbler (5-0-0-0) have been completely lost; others such as the Ovenbird (15-1-1-1) have declined drastically; others such as the Red-eyed Vireo (6-1-0.5-4) have declined but appear to be recovering; others such as the Com. Yellowthroat (3-4-10-7) have increased markedly; and others such as the Song Sparrow (0-0-3-6) are completely new. As in all local censuses executed this year, the gypsy moth caterpillar infestation was significant, and Brown-headed Cowbirds seemed especially numerous. A visiting Kentucky Warbler sang on the plot for one day.—ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.

74. JACK PINE FOREST I. — **Location:** New York; Clinton Co., 3.5 mi SE of Altona; $44^\circ 52' \text{N}$, $73^\circ 38' \text{W}$, Jericho Quadrangle, USGS. **Continuity:** New. **Size:** 3.75 ha = 9.26 acres ($250 \times 150 \text{ m}$, compass and 50-m tape). **Description of Plot:** This young Jack Pine (*Pinus banksiana*) stand is situated in the middle of a 25-acre area which burned in 1965 when the pines were only 8 years old following a 1957 wildfire. Jack Pine regeneration after the 1965 fire was limited by the small size of the trees and limited seed quantities, resulting in a patchy distribution of Jack Pines interspersed with openings which were invaded by Quaking Aspen (*Populus tremuloides*), Bigtooth Aspen (*P. grandidentata*), Red Maple (*Acer rubrum*), Paper Birch (*Betula papyrifera*), Gray Birch (*B. populifolia*), and Witch Hazel (*Hamamelis virginiana*). The ground cover is heavily dominated by Blueberry (*Vaccinium angustifolium*), relative density 54%, frequency 75%; and Chokeberry (*Aronia melanocarpa*), 18, 51. The Potsdam Sandstone substrate is exposed at the surface or covered with less than 0.5 in. of lichens or leaf litter. Trees, based on $771 \times 4 \text{ m}$ plots, 2010/acres; total basal area 15 ft²/acre. Species comprising

93% of total trees 4.5 ft tall or greater Jack Pine, 1564, 78, 57, 69; dead trees, 158, 8, 40, 13; Gray Birch, 131, 7, 2, 6. Trees by diameter size class: S (0-3 in.) 1986, 99, 12.5, 86; A (1-3 in.) 24, 1, 2, 14. Shrub stems/acre, 723. Mean height of ground cover, 5 in. Mean canopy height, 9 ft (range 5-17). **Edge:** Similar habitat for 50m on all sides. **Topography:** Nearly flat except for an abrupt 6 ft rise at a rocky ledge in the middle of the stand. **Elevation:** 920 ft. **Weather:** Partly cloudy to clear; no rain during census periods. **Coverage:** June 12-16, 21-25; 0500-0800. Total man-hours: 30. **Census:** White-throated Sparrow, 6.5 (173, 70); Rufous-sided Towhee, 4 (107, 43); Brown-headed Cowbird, 2; Com. Yellowthroat, 1.5; Cedar Waxwing, 1; Black-and-white Warbler, 1; Yellow-rumped Warbler, 0.5; Dark-eyed Junco, 0.5; Nashville Warbler, +; Ovenbird, +; Rose-breasted Grosbeak, +. **Total:** 11 species; 17 territorial males ($454/\text{km}^2$, 184/100 acres). **Visitors:** Am. Goldfinch, **Remarks:** Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

trol, while census 74 will be treated with prescribed fire. Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

76. JACK PINE FOREST III. — **Location:** New York; Clinton Co., 2 mi SE of Altona, $44^\circ 52' \text{N}$, $73^\circ 37' \text{W}$, W Chazy Quadrangle, USGS. **Continuity:** New. **Size:** 9.0 ha = 22.23 acres (square, compass and 50-m tape). **Description of Plot:** Even-aged forest almost exclusively comprised of live and dead Jack Pine (*Pinus banksiana*). Pines over 4.5 ft tall all date from a 1957 wildfire. Understory is sparse to absent. The shrub layer is heavily dominated by young pines (66%). The ground cover is dominated by Blueberry (*Vaccinium angustifolium*), relative density 67%, frequency 45%; Sheep Laurel (*Kalmia angustifolia*), 16, 21; and Huckleberry (*Gaultheria dumosa*), 7, 19. The Potsdam Sandstone substrate is exposed at the surface or covered with less than 0.5 in. of lichens or leaf litter. A seldom-used jeep trail forms the S border of the stand. Trees, based on $851 \times 4 \text{ m}$ plots; 6832/acre; total basal area 81 ft²/acre. Species comprising 96% of trees: Jack Pine, 6207, 91, 87, 86; dead trees, 357, 5, 9, 19. Trees by diameter size class: S (0-3 in.) 6567, 96, 63, 78; A (3-6 in.) 265, 4, 18, 22. Shrub stems/acre, 524. Mean canopy height, 10 ft (range 5-20). Mean height of ground cover, 5 in. **Edge:** Similar habitat on all sides. **Topography:** Almost flat. **Elevation:** 760 ft. **Weather:** Partly cloudy to clear, no rain during census periods. **Coverage:** June 11-15, 20-24, 0500-0800. Total man-hours: 30. **Census:** White-throated Sparrow, 11 (122, 49); Nashville Warbler, 3 (33, 13); Rufous-sided Towhee, 2.5; Cedar Waxwing, 2; Brown Thrasher, 1.5; Hermit Thrush, 1.5; Black-capped Chickadee, 1; Black-and-white Warbler, 1; Yellow-rumped Warbler, 1; Brown-headed Cowbird, 1; Dark-eyed Junco, 1; Am. Robin, +; Com. Yellowthroat, +; Field Sparrow, +. **Total:** 14 species; 26.5 territorial males ($295/\text{km}^2$, 119/100 acres). **Visitors:** Blue Jay, Ovenbird. **Remarks:** Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

77. JACK PINE FOREST IV. — **Location:** New York; Clinton Co., 4.8 mi NW of West Chazy; $44^\circ 51' \text{N}$, $73^\circ 36' \text{W}$, W Chazy Quadrangle, USGS. **Continuity:** New. **Size:** 9 ha = 22.23 acres (square, compass and 50-m tape). **Description of Plot:** Even-aged forest almost exclusively comprised of Jack Pines (*Pinus banksiana*). Pines in all height and diameter classes date from a 1940 wildfire. Understory is sparse to absent. A sparse shrub layer consists mostly of Mountain-holly (*Nemopanthus mucronata*). A dense ground cover is dominated by Blueberry (*Vaccinium angustifolium*), relative density 67%, frequency 68%; Sheep Laurel (*Kalmia angustifolia*), 13, 22; Huckleberry (*Gaultheria dumosa*), 10, 31; and Chokeberry (*Aronia*

melanocarpa), 7, 24. The Potsdam Sandstone substrate is exposed at the surface or covered with less than 0.5 in. of lichens or leaf litter. A seldom-used jeep trail forms the W border of the stand, and an abandoned power line right-of-way forms the E border. Trees, based on 85.5 × 5 m plots, 2670/acre; total basal area 126 ft²/acre. Species comprising 96% of trees: Jack Pine, 2556, 96, 98, 100. Trees by diameter size class: S (0-3 in.) 1835, 69, 30, 24; A (3-6 in.) 786, 29, 67, 53; B (6-9 in.) 16, 1, 4, 3; C (9-12 in.) 16, 1, 12, 10; D (12-15 in.) 16, 1, 13, 11. Shrub stems/acre, 981. Mean canopy height, 13 ft (range 5-32). Mean height of ground cover, 7 in. Edge: Similar habitat on N, E, and W. Small brook lined with narrow band of hardwoods within 100 m on S side, and divides this stand from a 62-year-old pine stand. Topography: Almost flat. Elevation: 740 ft. Weather: Partly cloudy to clear; no rain during census periods. Coverage: June 8, 10-12, 16, 18-21, 25; 0500-0800. Total man-hours: 30. Census: White-throated Sparrow, 8 (89, 36); Cedar Waxwing, 3.5 (39, 16); Chipping Sparrow, 3.5; Hermit Thrush, 2.5; Yellow-rumped Warbler, 2; Brown-headed Cowbird, 2; Dark-eyed Junco, 1; Great Crested Flycatcher, +; Blue Jay, +; Black-capped Chickadee, +; Brown Thrasher, +; Am. Robin, +; Nashville Warbler, +; Ovenbird, +; Field Sparrow, +. Total: 15 species; 20.5 territorial males (228/km², 92/100 acres). Visitors: Ruffed Grouse, Great Crested Flycatcher, Blue Jay, Veery, Rose-breasted Grosbeak, Purple Finch, Rufous-sided Towhee. Remarks: Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

78. JACK PINE FOREST V. — Location: New York; Clinton Co., 5 mi NW of West Chazy, 44°51'N, 73°37'W, W Chazy Quadrangle, USGS. Continuity: New. Size: 9 ha = 22.23 acres (square, compass and 50-m tape). Description of Plot: Even-aged forest almost exclusively composed of live and dead Jack Pines (*Pinus banksiana*). Pines in all height and diameter classes date from a 1940 wildfire. Understory and shrub layers are virtually absent. A dense ground cover is dominated by Blueberry (*Vaccinium angustifolium*), relative density 63%, frequency 41%, Huckleberry (*Gaylussacia dumosa*), 16, 18; and Chokeberry (*Aronia melanocarpa*), 11, 22. The Potsdam Sandstone substrate is exposed at the surface or covered with less than 0.5 in. of lichens or leaf litter. Trees, based on 85.5 × 5 m plots, 1221/acre; total basal area, 45 ft²/acre. Species comprising 100% of trees: Jack Pine, 1110, 91, 98, 83; dead trees, 111, 9, 2, 34. Trees by diameter size class: S (0-3 in.) 882, 72, 16, 34; A (3-6 in.) 320, 26, 26, 57; B (6-9 in.) 19, 2, 4, 9. Shrub stems/acre, 59. Average canopy height, 12 ft (range 5-26). Mean height of ground cover, 6 in. Edge: Similar habitat on E, S, and W. A small brook lined with a narrow band of hardwoods runs within 50 m of the N side of the stand. Topography: 7% slope dropping 70 ft from N to S. Elevation: 780-850 ft. Weather: Partly cloudy to

clear, no rain during census periods. Coverage: June 8, 10-13, 18-22; 0500-0800. Total man-hours: 30. Census: Cedar Waxwing, 5 (56, 22); Dark-eyed Junco, 3 (33, 13); Chipping Sparrow, 3; White-throated Sparrow, 2.5; Yellow-rumped Warbler, 2; Brown-headed Cowbird, 2; Black-capped Chickadee, 1; Am. Robin, 1; Hermit Thrush, 1; Mourning Dove, +; Brown Thrasher, +; Red-eyed Vireo, +; Black-and-white Warbler, +; Nashville Warbler, +; Com. Yellowthroat, +. Total: 15 species, 20.5 territorial males (228/km², 92/100 acres). Visitors: Ruffed Grouse, Great Crested Flycatcher, Blue Jay, Veery, Rose-breasted Grosbeak, Purple Finch, Rufous-sided Towhee. Remarks: Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

trol, while census 80 will be treated with prescribed fire. Both stands will then be censused repeatedly in ensuing years. One Am Robin nest was found. Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

80. JACK PINE FOREST VII. — Location: New York; Clinton Co., 3.5 mi NW of West Chazy, 44°50'N, 73°35'W, W Chazy Quadrangle, USGS. Continuity: New. Size: 9 ha = 22.23 acres (square, compass and 50-m tape). Description of Plot: Even-aged forest almost exclusively comprised of live and dead Jack Pines (*Pinus banksiana*). Living pines in all height and diameter classes date from a 1919 wildfire. Understory is sparse to absent. A very sparse shrub layer consists of Witch-hazel (*Hamamelis virginiana*), Red Maple (*Acer rubrum*), Nannyberry (*Viburnum lentago*), and Shadblush (*Amelanchier* sp.), in decreasing order of abundance. A dense ground cover is dominated by Blueberry (*Vaccinium angustifolium*), relative density 50%, frequency 71%; Huckleberry (*Gaylussacia dumosa*), 20, 41, and Sheep Laurel (*Kalmia angustifolia*), 21, 20. The Potsdam Sandstone substrate is exposed at the surface or covered with less than 0.5 in. of lichens or leaf litter. A seldom-used jeep trail borders the W side of the stand. Trees, based on 85.5 × 5 m plots, 1730/acre; total basal area 103 ft²/acre. Species comprising 97% of trees: Jack Pine, 1253, 72, 93, 98; dead trees, 431, 25, 7, 74. Trees by diameter size class: S (0-3 in.) 796, 46, 20, 20; A (3-6 in.) 917, 53, 78, 76, B (6-9 in.) 17, 1, 4, 4. Shrub stems/acre, 191. Mean canopy height, 17 ft (range 5-34); mean height of ground cover, 11 in. Edge: Similar habitat on N and S, streams lined with narrow band of hardwoods within 50 m of E and W sides of stand. Topography: Almost flat. Elevation: 690 ft. Weather: Partly cloudy to clear; no rain during census. Coverage: June 8, 10-11, 15-16, 18-20, 24-25; 0500-0800. Total man-hours: 30. Census: White-throated Sparrow, 5 (56, 22); Yellow-rumped Warbler, 3.5 (39, 16); Dark-eyed Junco, 3 5, Brown-headed Cowbird, 3 (33, 13); Chipping Sparrow, 2.5; Am. Robin, 2; Hermit Thrush, 2; Cedar Waxwing, 2; Com. Yellowthroat, 2, Com. Nighthawk, 1; Veery, 1; Am. Woodcock, +; Great Crested Flycatcher, +; Least Flycatcher, +; Blue Jay, +; Black-capped Chickadee, +; Brown Thrasher, +; Red-eyed Vireo, +; Field Sparrow, +. Total: 19 species; 27.5 territorial males (306/km², 124/100 acres). Visitors: Am Goldfinch. Remarks: One Com. Nighthawk nest was located. Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A. Seymour for assisting with field work and data analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

81. MIXED PITCH PINE-JACK PINE FOREST. — Location: New York; Clinton Co., 3 mi NW of West Chazy, 44°50'N, 73°35'W, W Chazy Quadrangle, USGS. Continuity: New. Size: 9 ha = 22.23 acres

(square, compass and 50-m tape) **Description of Plot:** Pitch Pine (*Pinus rigida*) and Jack Pine (*P. banksiana*) forest, all trees dating from a 1919 wildfire. Sparse understory of Red Maple (*Acer rubrum*) and Red Oak (*Quercus rubra*). Dense ground cover dominated by Blueberry (*Vaccinium angustifolium*), Huckleberry (*Gaultheria dumosa*), and Canada Mayflower (*Maianthemum canadense*). Trees, based on 85 5 × 5m plots, 846/acre; total basal area, 136 ft²/acre. Species comprising 90% of the total number of trees; Pitch Pine, 290, 34, 49, 61; Jack Pine, 211, 25, 35, 51; Red Maple, 149, 18, 1, 25, dead trees; 111, 13, 7, 45. Trees by diameter size class: S (0-3 in.) 307, 36, 3, 2; A (3-6 in.) 301, 36, 35, 26; B (6-9 in.) 168, 20, 48, 35; C (9-12 in.) 52, 6, 27, 20; D (12-15 in.) 12, 1, 12, 9; E (15-18 in.) none; F (18-21 in.) 6, 1, 11, 8 Shrub stems/acre, 2673. Average ground cover height 16 in., average canopy height 26 ft (range 7-71). **Edge:** Bordered on E and S by similar habitat; on W by abandoned power line right-of-way, on N by seldom-used jeep trail. **Topography:** 5% slope dropping 50 ft from W to E. **Elevation:** 650-700 ft. **Weather:** Seasonal temperatures, generally partly cloudy to clear, no rain during census periods. **Coverage:** June 8, 13-16, 18, 22-25; 0500-0800. Total man-hours: 30. **Census:** Brown-headed Cowbird, 4 (44, 18); Hermit Thrush, 3 (33, 13); Cedar Waxwing, 3; Chipping Sparrow, 3; White-throated Sparrow, 2 5; Solitary Vireo, 2; Am. Redstart, 2; Rufous-sided Towhee, 2; E. Wood Pewee, 1; Nashville Warbler, 1; Yellow-rumped Warbler, 1; Ovenbird, 1; Com. Yellowthroat, 1; House Wren, 0.5; Veery, 0.5; Red-eyed Vireo, +; Dark-eyed Junco, +. **Total:** 17 species; 27.5 territorial males (306/km², 124/100 acres). **Remarks:** Nest found: Cedar Waxwing. Thanks to G. Allen, S. Brauner, S. Cohen, K. McKeown, D. Pica, and A Seymour for assisting with data collection and analysis.—JAMES R. WOEHR, Institute for Man and Environment, State Univ. of N.Y., Plattsburgh, NY 12901.

82. 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; 13 consecutive years. **Size:** Approximately 9.3 ha = 23 acres. **Description of Plot:** See AFN 23: 743-744 (1969). **Weather:** See Census 59. **Coverage:** Apr. 10; May 9, 21, 28; June 4, 10, 18, 26; July 4, 11, 18, 25; Aug. 2, 10; 0730-2000, EDT. Total man-hours: 21.5. **Census:** Song Sparrow, 20 (215, 87); Chipping Sparrow, 16 (172, 70); Com. Yellowthroat, 9 (97, 39); Field Sparrow, 7 (75, 30); Cedar Waxwing, 5 (54, 22); Alder Flycatcher, 3 (32, 13); Yellow-rumped Warbler, 3; Brown-headed Cowbird (females), 3; Purple Finch, 3; Rufous-sided Towhee, 3; Am. Woodcock, 2; Am. Robin, 2; Gray Catbird, 1.5; Ruffed Grouse, 1; Tree Swallow, 1; E. Bluebird, 1; Nashville Warbler, 1; Magnolia Warbler, 1; Prairie Warbler, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Turkey, +; Blue Jay, +; Black-capped Chickadee, +; Brown Thrasher, +; Black-throated Green Warbler, +. **Total:** 26 species; 85.5 territorial males

(919/km², 372/100 acres). **Visitors:** Mourning Dove, Black-billed Cuckoo, E. Kingbird, Bobolink, and Henslow's Sparrow plus the following combination of birds that were seen hunting in the plot on almost every visit: Cooper's, Red-shouldered, Broad-winged, and Marsh hawks, Barred Owl and Com. Crow. **Remarks:** Nests found (31): Ruffed Grouse, 1; Alder Flycatcher, 1; Tree Swallow, 1; Am. Robin, 1; E. Bluebird, 1; Cedar Waxwing, 7; Yellow-rumped Warbler, 1; Purple Finch, 5; Am. Goldfinch, 1; Chipping Sparrow, 8; Field Sparrow, 2; Song Sparrow, 2. No nests found were parasitized by cowbirds. Turkey, Blue Jay and bluebird were new to the survey. Territorial males continue to increase since the low in 1978. Appreciation to Gaylord Rough for weather data and to Cynthia Clements and Phillips Foster for permission to conduct the survey on their land.—ELIZABETH W. BROOKS, 1435 Waterwells Rd., Alfred Station, NY 14803.

83. ATLANTIC WHITE CEDAR. — **Location:** Virginia; Suffolk, Great Dismal Swamp N.W.R., 300 yds N of Camp Ditch Road, 0.7 mi E of intersection with Jericho Ditch Rd; 36°40'35"N, 76°28'30"W. **Continuity:** Established 1980. **Size:** 17.3 ha = 17.3 acres. **Description of Plot:** See AB 35: 68-69 (1981). **Weather:** Sunny and warm after 2 wet weeks. Two heavy rains came during the census period. **Coverage:** Apr. 20-June 7. Total man-hours: 36. **Census:** Prairie Warbler, 17 (243, 98); Prothonotary Warbler, 15 (214, 87); Hooded Warbler, 10.5 (150, 61); Ovenbird, 7 (100, 40); Red-eyed Vireo, 3 (43, 17); White-eyed Vireo, 2.5; Com. Yellowthroat, 2.5; Great Crested Flycatcher, 2; Acadian Flycatcher, 2; Carolina Chickadee, 2; Worm-eating Warbler, 2; Rufous-sided Towhee, 2; Pileated Woodpecker, 1; Blue Jay, 1; Tufted Titmouse, 1; Gray Catbird, 1; Wood Thrush, 1; Cardinal, 1; Red-shouldered Hawk, +; Mourning Dove, +. **Total:** 20 species; 73.5 territorial males or females (1050/km², 425/100 acres). **Visitors:** Downy Woodpecker, E. Wood Pewee, Black-and-white Warbler, N. Parula. **Remarks:** Nests found (9): Pileated Woodpecker, Acadian Flycatcher, Red-eyed Vireo, Hooded (2), Prairie and Prothonotary warblers, Cardinal, Rufous-sided Towhee. Rains during the last week in May may have interrupted the progress of the season as one Hooded Warbler pair was found laying a second clutch.—KAREN TERWILLIGER, 1616 Ward Tr., Portsmouth, VA 23704.

84. ATLANTIC WHITE CEDAR. — **Location:** North Carolina; Camden Co., Corapeake, N.C. State Park Land, 300 yd E of Forest Line Rd, 0.5 mi S of intersection with Corapeake Rd, 36°31'43"N, 76°27'30"W; Lake Drummond Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 7 ha = 17.3 acres. **Description of Plot:** See AB 35: 69 (1981). **Weather:** Sunny and warm with 3 heavy rains during the period. Last week of May was too wet for access. **Coverage:** Apr. 20-June 6. Total man-hours: 36. **Census:** Com. Yellowthroat, 16 (229, 92); Prairie Warbler, 15 (214, 87); Hooded Warbler, 12 (171, 69); Ovenbird, 8 (114, 46); Worm-eating Warbler, 4 (57, 23); Carolina Chickadee, 3 (43, 17); Wood Thrush, 3; Prothonotary War-

bler, 3; Great Crested Flycatcher, 2; Gray Catbird, 2; Rufous-sided Towhee, 2; Acadian Flycatcher, 1; Blue Jay, 1; Tufted Titmouse, 1; White-eyed Vireo, 1; Mourning Dove, +. **Total:** 16 species; 74 territorial males or females (1057/km², 428/100 acres). **Visitors:** E. Wood Pewee, Com. Crow. **Remarks:** Nests found (6): Acadian Flycatcher, Wood Thrush, White-eyed Vireo, Hooded and Prairie warblers, Com. Yellowthroat. A slight decrease in densities was noted from the previous year.—KAREN TERWILLIGER, 1616 Ward Tr., Portsmouth, VA 23704

85. LONGLEAF PINE FOREST. — **Location:** South Carolina; Charleston Co., The Wedge Plantation, 6 mi NE of McClellanville of the South Santee River; 33°10'N, 79°24'W, Santee Quadrangle, USGS. **Continuity:** New. **Size:** 8.05 ha = 19.9 acres (rectangular, 550 × 175 yds measured with chain and compass). **Description of Plot:** This Longleaf Pine (*Pinus palustris*) plot was probably clearcut in the 1890s. Selective cuts occurred in the 1930s or 1940s, and the plot has been maintained by regular burning of the understory. The dominant tree is Longleaf Pine with a few scattered oaks. The understory is composed of Sweet Gum (*Liquidambar styraciflua*), Sweet Pepperbush (*Clethra alnifolia*), Sassafras (*albidum*), Running Oak (*Quercus pumila*) and Inkberry (*Ilex glabra*). The ground cover is mainly Bracken (*Pteridium aquilinum*), Sweet Pepperbush, Stagger-bush (*Lyonia mariana*), and Bluestem (*Andropogon gerardii*). A quantitative survey of the vegetation gave the following results: Trees 3 in. in diameter and over, based on ten 0.1-acre circular samples, 142/acre; total basal area 101 ft²/acre. Species comprising 90% of the total number of trees: Long-leaf Pine 135, 95, 98, 100. Trees by diameter class: A (3-6 in.) 26, 18, 2.6, 3; B (6-9 in.) 38, 27, 11.4, 11; C (9-15 in.) 55, 39, 44, 01, 44; D (15-21 in.) 22, 15, 39, 6, 44, E (21-27 in.) 1, 1, 3.1, 3. Shrub stems per acre 406; ground cover 48%; canopy cover 43%, average canopy height 71 ft (range 62-84). **Edge:** Similar habitat on all sides; bisected by an unpaved road. **Topography:** Flat terrain on sandy soil; transected by shallow fire lanes and drainage ditches. **Elevation:** 20 ft (6.09 m). **Weather:** Temperature 70-91°F, wind speed 0-7 mph; no precipitation occurred during counts; April-June temperatures were normal; rainfall was below normal. **Coverage:** May 11, 22, 26, 30; June 4, 7, 10, 19; 0615-1000, EDT. Total man-hours 16. **Census:** E. Wood Pewee, 5 (62, 25), Pine Warbler, 5; Great Crested Flycatcher, 4 (50, 20); Rufous-sided Towhee, 4; White-eyed Vireo, 3 (37, 15); Com. Yellowthroat, 3; Bobwhite, 2; Brown-headed Nuthatch, 2; Red-headed Woodpecker, 1; Red-cockaded Woodpecker, 1; Carolina Chickadee, 1, Carolina Wren, 1; Blue-gray Gnatcatcher, 1, N. Parula, 1; Yellow-throated Warbler, 1; Prairie Warbler, 1; Hooded Warbler, 1; Summer Tanager, 1; Cardinal, 1; Indigo Bunting, 1; Chuck-will's-widow, 0.5; Brown-headed Cowbird, 0.5. **Total:** 22 species; 41 territorial males (509/km², 206/100 acres). **Visitors:** Com. Flicker, Pileated Woodpecker, Red-bellied Woodpecker, Downy Woodpecker, Purple Martin, Fish Crow, E. Bluebird. **Remarks:** Nests found: Red-headed Wood-

pecker, 1; Brown-headed Nuthatch, 1. Although Red-cockaded Woodpeckers were observed on each trip, the birds were from a known nest tree 150 yds E of the plot. Thanks to Mrs. R.B. Dominick for permission to work on the site and to M.A. McClure for aid in measuring the plot. Funds for this study were provided by the School of Public Health, Univ. of S.C. and the Citadel Development Foundation. This is technical contribution number 81-01 from the Vector Biology Research Program.—DENNIS M. FORSYTHE, Dept. of Biology, The Citadel, Charleston, SC 29409.

86. MATURE LONGLEAF PINE FOREST. — **Location:** Georgia; Thomas Co., Arcadia Plantation, 4 mi SE of the junction of Rts 319 and 212; 30°45'N, 84°00'W, Pine Park and Thomasville Quadrangles, USGS. **Continuity:** Established 1980; 2 consecutive years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 35: 69 (1981). **Weather:** Fair; 42-76°F. **Coverage:** Apr. 11, 18, 27; May 1, 7, 16, 25, 31. Total man-hours: 22.3. **Census:** Indigo Bunting, 9 (45, 18); Rufous-sided Towhee, 9; Bachman's Sparrow, 8 (40, 16); E. Meadowlark, 6 (53, 12); Blue Grosbeak, 5.5 (28, 11); Great Crested Flycatcher, 4.5 (23, 9); Blue Jay, 4.5; Com. Yellowthroat, 4.5; Red-bellied Woodpecker, 4; Brown-headed Cowbird, 4; White-breasted Nuthatch, 3.5 (18, 7); Com. Flicker, 3 (15, 6); E. Wood Pewee, 3; Brown-headed Nuthatch, 3; Mourning Dove, 2.5; Wood Duck, 2; Bobwhite, 2; Pine Warbler, 2; Red-cockaded Woodpecker, 1.5; Tufted Titmouse, 1.5; Carolina Wren, 1.5; E. Bluebird, 1.5; Yellow-breasted Chat, 1.5; Hairy Woodpecker, 1; Loggerhead Shrike, 1; Orchard Oriole, 1; Summer Tanager, 1; Great Horned Owl, +; Pileated Woodpecker, +; Downy Woodpecker, +; E. Kingbird, +; Carolina Chickadee, +; Brown Thrasher, +; Cardinal, +. **Total:** 9 species; 15.5 territorial males (77/km², 31/100 acres). **Visitors:** Red-shouldered Hawk, Swallow-tailed Kite, Screech Owl, Com. Nighthawk. **Remarks:** Nests found: Red-bellied Woodpecker, 2; Blue Jay, 2; Downy Woodpecker, 1. Burning resulted in a 91% reduction in the number of live stems greater than 3 ft in the sample plots. Herbaceous vegetation and most hardwoods and shrubs resprouted but were still less than 3 ft tall. The total number of bird species recorded is less than last year (9 compared to 13), even though the total number of territorial males had not decreased greatly (15.5 compared to 17). Pine Warbler numbers were down (1 compared to 7).—ANTHONY CAPRIO and DALE L. TAYLOR, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.

87. CUTOVER SUBTROPICAL SLASH PINE FOREST. — **Location:** Florida; Dade Co., Everglades Nat'l Park, western Long Pine Key, Pine Block E, about 150 m E of fire ecology longterm plot E6; 25°25'N, 80°41'30"W, Long Pine Key Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 20 ha = 50 acres. **Description of Plot:** See AB 35: 69-70, 104 (1980). Pine Block E and the plot were burned on September 18, 1980 with a backing fire. The fire had little impact on the Slash Pine (*Pinus elliottii* var. *densa*) overstory. A substantial change occurred in the understory shrub and hardwood component. A quantitative survey of these shrubs and hardwoods based in the same eight 0.1 acre rectangular plots used for the 1980 survey gave the following results: Understory hardwood and shrubs 342 stems/acre. By height class (figures after each class show

number of stems/acres, relative density (%), number of species comprising height class): A (3-5 ft), 329, 96, 14; B (5-10 ft) 10, 3, 4; C (> than 10 ft) 3, 1, 3. **Weather:** Two of the 10 days were clear, mean cloud cover 23%, range 0-100%; windspeed less than 2 km/h during all visits; dew was present on 6 visits; precipitation (thunderstorms) occurred twice in early May. Mean temperature at the start of all visits was 20°C (range 17°-25°). **Coverage:** Apr. 15-16, 21-22, 27-28; May 5-6, 13, 15; generally 0600-0830, EST. Total man-hours: 24. **Census:** Red-bellied Woodpecker, 6 (30, 12); Blue Jay, 2.5; Carolina Wren, 2; Downy Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Com. Flicker, 1; Pine Warbler, 1; Bobwhite, +; Rufous-sided Towhee, +. **Total:** 9 species; 15.5 territorial males (77/km², 31/100 acres). **Visitors:** Red-shouldered Hawk, Swallow-tailed Kite, Screech Owl, Com. Nighthawk. **Remarks:** Nests found: Red-bellied Woodpecker, 2; Blue Jay, 2; Downy Woodpecker, 1. Burning resulted in a 91% reduction in the number of live stems greater than 3 ft in the sample plots. Herbaceous vegetation and most hardwoods and shrubs resprouted but were still less than 3 ft tall. The total number of bird species recorded is less than last year (9 compared to 13), even though the total number of territorial males had not decreased greatly (15.5 compared to 17). Pine Warbler numbers were down (1 compared to 7).—ANTHONY CAPRIO and DALE L. TAYLOR, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.

white, 2; Blue-gray Gnatcatcher, 2; Pine Warbler, 2; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; Brown-headed Nuthatch, 1; E. Bluebird, 1; Red-winged Blackbird, 1; Cardinal, 1; Rufous-sided Towhee, 1. **Total:** 12 species; 17 territorial males (292/km², 118/100 acres). **Visitors:** Red-shouldered Hawk, Com. Flicker, Hairy Woodpecker, Carolina Wren. **Remarks:** the February fire caused minimal impact on overstory trees. Most above ground shrubs and understory plants were top-killed. Recovery of the shrubs was about one-third of their pre-burn coverage and understory vegetation about 25% by the start of the census. The number of bird species and territorial males remained almost constant in pre- and post-fire censuses on these 2 pine islands.—ANTHONY CAPRIO, DALE L. TAYLOR, MIKE BRITTON and REGINA ROCHEFORT, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.

89. VIRGIN SUBTROPICAL SLASH PINE FOREST—DECEMBER BURN. — **Location:** Florida; Collier Co., Big Cypress Nat'l Preserve, Sec. 28, 33; T51S, R34E, 25°28'N, 81°55'W, N of Fifty-mile Bend Quadrangle, USGS. **Continuity:** New [1980 census, AB 35: 70 (1981), broken into 4 plots with differing burn schedules]. **Size:** 4.4 ha = 10.8 acres (two transects totalling 900 m, 160 ft strip; measured with compass and tape). **Description of Plot:** Two adjacent pine islands (10.4 and 33.0 ha) located within a mosaic of interspersed pine forest islands, cypress domes, and cypress prairies. The pine islands were burned on Dec. 10, 1980. Quantitative analysis of the pine forest vegetation based on four 0.06 ha plots gave the following results. For trees 1 in. dbh and larger, 191/acre; total basal area 69.7 ft²/acre. Species comprising 100% of the total number of trees: Slash Pine (*Pinus elliottii* var. *densa*) 184, 97, 97, 74; Cabbage Palmetto (*Sabal palmetto*) 7, 3, 3, 5. Shrubs covered 13% of ground area 7 months post-burn. Dominant species (followed by importance value) were *Serenoa repens* (231) and *Sabal palmetto* (75). Understory species covered 20% of the ground area. Major species were *Muhlenbergia filipes*, *Rhynchospora divergens*, *Schizachyrium rhizomatum*, *Paspalum monostachyum*, *Cladium jamaicense*. **Edge:** Similar habitat on all sides. **Topography:** Flat. **Elevation:** 3-4 m. **Weather:** Cloud cover; mean 29%, range 0-100%. Wind: 0-5 mph on all visits. Temperature: mean 73°F, range 65-75°. Precipitation: none during visits, dew present on vegetation 35% of time, ground dry on all visits. **Coverage:** Apr. 1, 13, 28; May 1, 5, 7, 14, 16; 0610-0845, EST. Total man-hours: 6.5. **Census:** Pine Warbler, 4 (92, 37); Red-bellied Woodpecker, 4; Bobwhite, 3 (69, 28); Brown-headed Nuthatch, 3; E. Bluebird, 2; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue-gray Gnatcatcher, 1; Cardinal, 1. **Total:** 10 species; 20 territorial males (458/km², 185/100 acres). **Visitors:** Wood Duck, Swallow-tailed Kite, Red-cockaded Woodpecker, Com. Crow, Com. Flicker, Carolina Wren, Com. Yellowthroat, Red-winged Blackbird, Com. Grackle, Rufous-sided Towhee. **Remarks:** Nests found: Pileated Woodpecker,

1, Brown-headed Nuthatch, 1, E. Bluebird, 1. The fire had little impact on overstory tree species. Impact on shrubs and understory species was severe, but temporary. By the start of the census period, shrubs had recovered about 65% of their preburn coverage. Number of bird species on the 2 pine islands declined from 14 to 10, but the number of territorial males remained nearly constant.—*ANTHONY CAPRIO, DALE L. TAYLOR, MIKE BRITTON, and REGINA ROCHEFORT, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.*

90. VIRGIN SUBTROPICAL SLASH PINE FOREST—SUMMER BURN.—**Location:** Florida; Collier Co., Big Cypress Nat'l Preserve, Sec. 33, 34; T51S, R34E; 25°28'N, 81°55'W. N of Fifty-mile Bend Quadrangle, USGS. **Continuity:** New [1980 census, AB 35: 70 (1981), broken into 4 plots with differing burn schedules]. **Size:** 5.8 ha = 14.4 acres (two transects totaling 1200 m, 160 ft strip; measured with compass and tape). **Description of Plot:** Two adjacent pine islands (13.6 and 26.8 ha) located within a mosaic of interspersed pine forest islands, cypress domes and cypress prairies. The pine islands were burned on Aug. 14, 1980. Quantitative analysis of the pine forest vegetation based on four 0.06 ha plots gave the following results. For trees 1 in dbh and larger, 177/acre, total basal area 61.5 ft²/acre. Species comprising 100% of the total number of trees: Slash Pine (*Pinus elliottii* var. *densa*) 196, 94, 98, 66; Pond Cypress (*Taxodium ascendens*) 13, 8, 3, 10. Shrubs covered about 16% of the ground area. Major species (followed by importance value) were *Serenoa repens* (219), *Sabal palmetto* (61), *Myrsine floridana* (10), *Persea borbonia* (6), *Myrica cerifera* (4). **Edge:** Similar habitat on all sides. **Topography:** Flat. **Elevation:** 3-4 m. **Weather:** Cloud cover; mean 13%, range 1-20%. Wind: 0-5 mph on 3 visits, none on 2. **Temperature:** Mean 74°F, range 70-80°. Precipitation: None, dew present on one visit, ground dry on all visits. **Coverage:** Apr 13, 28; May 5, 7, 14; 0540-0920, EST. Total man-hours: 5. **Census:** Blue-gray Gnatcatcher, 1; Brown-headed Nuthatch, 1; E. Bluebird, 1; Pine Warbler, 1. **Total:** 4 species; 4 territorial males (137/km², 56/100 acres). **Visitors:** Swallow-tailed Kite, Bobwhite, Com. Flicker, Red-bellied Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Carolina Wren, Cardinal, Rufous-sided Towhee. **Remarks:** The number of species and territorial males was about 50% lower during this year's census compared to a year ago. Only the Pine Warbler and E. Bluebird were found both years.—*ANTHONY CAPRIO, DALE L. TAYLOR, MIKE BRITTON and REGINA ROCHEFORT, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.*

91. VIRGIN SUBTROPICAL SLASH PINE FOREST—UNBURNED CONTROL.—**Location:** Florida; Collier Co., Big Cypress Nat'l Preserve, Sec. 33; T51S, R34E, 25°28'N; 81°55'W; N of Fifty-mile Bend Quadrangle, USGS. **Continuity:** New [1980 census, AB 35: 70 (1981), broken into 4 plots with differing burn schedules]. **Size:** 2.9 ha = 7.2 acres (1 transect totaling 600 m, 160 ft strip; measured with compass and tape). **Description of Plot:** A pine island (18.6 ha) located within a mosaic of interspersed pine forest islands, cypress domes and cypress prairies. It remained unburned during the 1980-81 fire year. Quantitative analysis of the pine forest based on four 0.06 ha plots gave the following results. For trees 1 in. dbh and larger, 177/acre, total basal area 61.5 ft²/acre. Species comprising 100% of the total number of trees: Slash Pine (*Pinus elliottii* var. *densa*) 164, 92, 97, 90; Pond Cypress (*Taxodium ascendens*) 13, 8, 3, 10. Shrubs covered about 16% of the ground area. Major species (followed by importance value) were *Serenoa repens* (219), *Sabal palmetto* (61), *Myrsine floridana* (10), *Persea borbonia* (6), *Myrica cerifera* (4). **Edge:** Similar habitat on all sides. **Topography:** Flat. **Elevation:** 3-4 m. **Weather:** Cloud cover; mean 13%, range 1-20%. Wind: 0-5 mph on 3 visits, none on 2. **Temperature:** Mean 74°F, range 70-80°. Precipitation: None, dew present on one visit, ground dry on all visits. **Coverage:** Apr 13, 28; May 5, 7, 14; 0540-0920, EST. Total man-hours: 5. **Census:** Blue-gray Gnatcatcher, 1; Brown-headed Nuthatch, 1; E. Bluebird, 1; Pine Warbler, 1. **Total:** 4 species; 4 territorial males (137/km², 56/100 acres). **Visitors:** Swallow-tailed Kite, Bobwhite, Com. Flicker, Red-bellied Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Carolina Wren, Cardinal, Rufous-sided Towhee. **Remarks:** The number of species and territorial males was about 50% lower during this year's census compared to a year ago. Only the Pine Warbler and E. Bluebird were found both years.—*ANTHONY CAPRIO, DALE L. TAYLOR, MIKE BRITTON and REGINA ROCHEFORT, Nat'l Park Service, South Florida Research Center, Everglades Nat'l Park, Homestead, FL 33030.*

92. JACK PINE—BLACK SPRUCE FOREST.—**Location:** Michigan; Schoolcraft Co., 7 mi E of Shingleton, 1 mi S of M-28; 46°19'55"N, 86°18'25"W; Shingleton Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 17.5 ha = 43.2 acres. **Description of Plot:** See AB 35: 70-71 (1981). An independent sample of vegetation taken in 1981 gave the following results: Trees 3 cm diameter and over, based on 40 0.1-acre circular samples, 567.3/acre; total basal area 111.6 ft²/acre. Species comprising at least 90% of the total number of trees: Jack Pine (*Pinus banksiana*), 249, 44, 71, 100; Black Spruce (*Picea mariana*), 156, 28, 15, 97; dead trees, 141, 25, 11, 97. Trees by diameter size class: S (3-8 cm) 143.5, 25, 3.7, 3; A (8-15 cm) 216.5, 38, 21.5, 19; B (15-23 cm) 159, 28, 47.7, 43; C (23-38 cm) 48.3, 9, 38.6, 35. Shrub stems/acre 1794; ground over 78%; canopy cover 50%; average canopy height 16 m (range 9.4-21 m). **Weather:** Temperatures and precipitation normal throughout the pe-

riod. Mean temperature at the start of morning censuses was 7°C (range -4°-18°). **Coverage:** May 27-28, 30-31; June 2, 4-9, 11-13, 15, 20, 22; 0540-1030. Total man-hours 104. **Census:** Ovenbird, 9 (51, 21); Golden-crowned Kinglet, 8 (46, 18); Yellow-rumped Warbler, 7 (40, 16); White-throated Sparrow, 7; Nashville Warbler, 6.5 (37, 15); Cape May Warbler, 6 (34, 14); Chipping Sparrow, 5.5 (31, 13); Hermit Thrush, 4 (23, 9); Dark-eyed Junco, 3 (17, 7); Boreal Chickadee, 2.5; Black-capped Chickadee, 2; Brown Creeper, 2; Ruby-crowned Kinglet, 2; Com. Yellowthroat, 2; Red-breasted Nuthatch, 1; Solitary Vireo, 1; Hairy Woodpecker, +; Blue Jay, +; Yellow-bellied Flycatcher, +; Magnolia Warbler, +. **Total:** 20 species; 68.5 territories (392/km², 159/100 acres). **Visitors:** Broad-winged Hawk, Com. Flicker, Pileated Woodpecker, Gray Jay, Am. Robin, Cedar Waxwing, Red-eyed Vireo, Black-throated Green Warbler, Connecticut Warbler, Evening Grosbeak, Purple Finch, Am Goldfinch, Lincoln's Sparrow. **Remarks:** Nests found: Red-breasted Nuthatch, Hermit Thrush (2), Ovenbird (2), Dark-eyed Junco.—*DEANNA DAWSON and BARBARA DOWELL, Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, MD 20708*

93. 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; 14 consecutive years. **Size:** 14.16 ha = 35 acres. **Description of Plot:** See AFN 22 714-715 (1968). **Coverage:** May 22, 29, June 5, 14, 30; 0540-0945, EDT. Total man-hours 14. **Census:** Ovenbird, 5 (35, 14), Wood Thrush, 4 (28, 11); Blue Jay, 3 (21, 9), White-breasted Nuthatch, 2; House Wren, 2, Am Robin, 2; Veery, 2; Rufous-sided Towhee, 2, Great Crested Flycatcher, 1; E. Wood Pewee, 1; Black-capped Chickadee, 1, Tufted Titmouse, 1; Black-and-white Warbler, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Song Sparrow, 1; Ruffed Grouse, +, Mourning Dove, +; Chimney Swift, +, Com. Flicker, +; Downy Woodpecker, +, E. Phoebe, +; Gray Catbird, +; Red-eyed Vireo, +; Blue-winged Warbler, +; Prairie Warbler, +; Com. Yellowthroat, +; Field Sparrow, +. **Total:** 30 species; 32 territorial males (226/km², 91/100 acres). **Visitors:** Com. Crow, Brown Thrasher, Chestnut-sided Warbler, N. Oriole, Red-winged Blackbird, Com. Grackle, Indigo Bunting, House Finch. **Remarks:** There were 7 more species and 3 fewer territorial males than in 1980, despite tremendous defoliation caused by gypsy moth larvae.—*LEON L. BARKMAN and POLLY BRODY, Western Conn Bird Club, P.O. Box 542, Woodbury, CT 06798.*

94. OAK FOREST, PASTURES AND THICKETS.—**Location:** Connecticut, Middlesex Co., Dolbia Hill and adjacent Burnham Brook Preserve, East Haddam (SE corner), 41°21'30"N, 72°19'W, Hamburg Quadrangle, USGS. **Continuity:** Established 1964, 3 intermittent years. **Size:** AREA I, 14.2 ha = 35 acres (including 26 acres of oak forest, 6 acres of swamp forest, and 3 acres of Red

Cedars), AREA II, 14.2 ha = 35 acres (including 15 acres of pasture, 5 acres of open abandoned fields, 14 acres of thickets and young forest, and 1 acre of farmyard). **Description of Plots:** AREA I, Oak Forest: See AFN 18: 568 (1964), 21: 669 (1967). The woodland continues to recover from the 1959-60 lumbering operation. A severe gypsy moth infestation this year defoliated much of the study area. AREA II, Pasture, Thicket and Young Forest: Twelve acres of the pasture have been continuously grazed by livestock during the growing seasons—cattle up to 1979; horses for the past 2 years. Four of the 9 nesting boxes erected were occupied. Some of the thicket present in 1967 has now become young forest. **Edge:** AREA I is bounded on 3 sides by similar forested country and on the N by Area II. AREA II is bounded on all sides by forest, that on the N described in AFN 19: 592-593 (1965). **Topography:** AREA I, ledgy ridges 330-530 ft; AREA II, greatly sloping, 350-450 ft. **Coverage:** May 13-14, 20-22, 24-25, 27, 31; June 1, 3, 6-8, 10, 12, 17, 19-20; 0545-0900, 0930-1030, and 1700-1800, EDT. Total man-hours: 28 **Census:** AREA I, OAK FOREST: Ovenbird, 10.5 (74, 30); Red-eyed Vireo, 7 (49, 20); Veery, 5.5 (39, 16); Wood Thrush, 5 (35, 14); Scarlet Tanager, 5; Black-capped Chickadee, 4 (28, 11); Worm-eating Warbler, 4; Rufous-sided Towhee, 4; Black-and-white Warbler, 3.5 (25, 10); Tufted Titmouse, 3 (21, 9); Yellow-throated Vireo, 3; Canada Warbler, 3, Am. Redstart, 3; Yellow-billed Cuckoo, 2; E. Wood Pewee, 2; Blue Jay, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Blue-gray Gnatcatcher, 2; Mourning Dove, 1.5, N Oriole, 1.5; Ruffed Grouse, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; Gray Catbird, 1; Hermit Thrush, 1; Blue-winged Warbler, 1; Hooded Warbler, 1; Cardinal, 1; Rose-breasted Grosbeak, 1. **Total:** 32 species; 86.5 territorial males ($611/\text{km}^2$, 247/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Red-shouldered Hawk, Peregrine Falcon, Black-billed Cuckoo, Barred Owl, Whip-poor-will, Chimney Swift, Com. Flicker, Pileated Woodpecker, Red-bellied Woodpecker, Tree Swallow, Barn Swallow, Com. Crow, House Wren, Swainson's Thrush, Cedar Waxwing, Starling, N. Parula, Magnolia, Yellow-rumped, Black-throated Green, Cerulean, Chestnut-sided, Blackpoll, and Prairie warblers, Louisiana Waterthrush, Com. Yellowthroat, Red-winged Blackbird, Brown-headed Cowbird, Purple Finch, House Finch, Chipping Sparrow. **Remarks:** Nests found (4): E. Phoebe, 1; Am. Robin, 1; Veery, 2. A decline in number of thicket species (Rufous-sided Towhee, Hooded Warbler, House Wren, Chestnut-sided Warbler, Chipping Sparrow) and an increase in interior forest species (Veery, Yellow-throated Vireo, Canada Warbler) may reflect the continuing recovery of the area from the 1959-60 lumbering operation. **Census:** AREA II, PASTURE, THICKET AND YOUNG FOREST: Brown-headed Cowbird, 5 (35, 14); Chipping Sparrow, 5; Ovenbird, 4.5 (32, 13); Tree Swallow, 4 (28, 11); Rufous-sided Towhee, 4; House Wren, 3 (21, 9); Prairie Warbler, 3; N. Oriole, 3; Field Sparrow, 3; Chimney Swift, 2; Barn Swallow, 2; Gray Catbird, 2; Am. Robin, 2; Starling, 2; Red-eyed Vireo, 2;

Blue-winged Warbler, 2; House Sparrow, 2; Scarlet Tanager, 2; Mourning Dove, 1.5; Ruffed Grouse, 1; Am. Woodcock, 1; Black-billed Cuckoo, 1; Whip-poor-will, 1; E. Kingbird, 1; Mockingbird, 1; Veery, 1; Black-and-white Warbler, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Purple Finch, 1; House Finch, 1. **Total:** 31 species; 66 territorial males or females ($466/\text{km}^2$, 189/100 acres). **Visitors:** Mallard, Turkey Vulture, Red-tailed Hawk, Red-shouldered Hawk, Broad-winged Hawk, Osprey, Am. Kestrel, Yellow-billed Cuckoo, Com. Nighthawk, Ruby-throated Hummingbird, Com. Flicker, Pileated Woodpecker, Red-bellied Woodpecker, Great Crested Flycatcher, E. Phoebe, E. Wood Pewee, Blue Jay, Com. Crow, Black-capped Chickadee, Tufted Titmouse, Wood Thrush, E. Bluebird, Blue-gray Gnatcatcher, Cedar Waxwing, Yellow-rumped Warbler, Com. Yellowthroat, Am. Redstart, Red-winged Blackbird, Com. Grackle, Blue Grosbeak, Evening Grosbeak, Am. Goldfinch, Song Sparrow. **Remarks:** Nests found (18): Chimney Swift, 2; E. Kingbird, 1; Tree Swallow, 4; Barn Swallow, 2; House Wren, 2; Starling, 1; House Sparrow, 2; N. Oriole, 2; House Finch, 1; Rufous-sided Towhee, 1. Compared with the 1967 census, there was a marked decline in the breeding population of towhees and House Wrens; E. Bluebirds and E. Meadowlarks are still absent as breeders after 4 years.—*R.H. GOODWIN, Dept. of Botany, Conn. College, New London, CT 06320, and JULIE S. ZICKEFOOSE, 8508 Academy Rd, Richmond VA 23229.*

95. UPLAND BRUSHY PASTURE. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°42'N, 73°13'28"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 15 intermittent years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AFN 19: 609-610 (1965). **Coverage:** Apr. 9; June 2, 4, 6, 9-11. Total man-hours: 11. **Census:** Gray Catbird, 18 (212, 86); Blue-winged Warbler, 8 (94, 38); Red-eyed Vireo, 7 (82, 33); Com. Yellowthroat, 7; Black-capped Chickadee, 5 (59, 24); Cedar Waxwing, 4 (47, 19); Black-and-white Warbler, 4; Am. Goldfinch, 4; Rufous-sided Towhee, 4; Nashville Warbler, 3 (35, 14); Rose-breasted Grosbeak, 3; Am. Woodcock, 2; Blue Jay, 2; Veery, 2; Chestnut-sided Warbler, 2; Ovenbird, 2; Am. Redstart, 2; Field Sparrow, 2; Ruffed Grouse, 1; Black-billed Cuckoo, 1; Screech Owl, 1; Tufted Titmouse, 1; Wood Thrush, 1; Yellow Warbler, 1; Canada Warbler, 1; N. Oriole, 1; Cardinal, 1; Com. Flicker, 0.5; Com. Crow, 0.5; Warbling Vireo, 0.5; Scarlet Tanager, 0.5; Broad-winged Hawk, +; Yellow-billed Cuckoo, +; Great Horned Owl, +; Barred Owl, +; E. Kingbird, +. **Total:** 36 species; 92 territorial males ($1083/\text{km}^2$, 438/100 acres). **Remarks:** Growth of vegetation remains significant every year. After considerable rises in both species numbers and numbers of territorial males for many years, for the second year in a row there was a decline. This year species dropped by 4, and territorial males by 7. New breeders in the increased growth were single Screech Owl and Canada Warbler.—*ANDREW MAGEE, 34 Hobson St, Springfield, MA 01109.*

96. DECIDUOUS FOREST WITH POND AND BROOK. — **Location:** New Jersey, Bergen Co., Mahwah; Campgaw Mountain Reservation. **Continuity:** Established 1964, 18 consecutive years. **Size:** Approximately 16.2 ha = 40 acres. **Description of Plot:** See AFN 19: 623-624 (1965). **Coverage:** May 19, 21, 26, 28, 30; June 4, 9, 11, 16; 0530-0700 Total party-hours: 12. **Census:** Veery, 4 (25, 10); Starling, 4; Ovenbird, 4; Tree Swallow, 3 (19, 8); Tufted Titmouse, 3; Scarlet Tanager, 3; Com. Flicker, 2; E. Wood Pewee, 2; Black-capped Chickadee, 2; Gray Catbird, 2; Wood Thrush, 2; Blue-winged Warbler, 2; Cardinal, 2; Indigo Bunting, 2; Song Sparrow, 2; Yellow-billed Cuckoo, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Brown Creeper, 1; House Wren, 1; Am. Robin, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Louisiana Waterthrush, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Rufous-sided Towhee, 1. **Total:** 29 species; 53 territorial males ($327/\text{km}^2$, 133/100 acres).—*J.M. BROTHERTON (compiler), Fyke Nature Assoc., 249 E. Crescent Ave, Mahwah, NJ 07430.*

97. BRUSHY FIELD AND WOODED EDGE. — **Location:** Pennsylvania; Cumberland Co., 1 mi NE of Carlisle, 0.3 mi NW of US Rt. 11, off Cavalry Rd on Nat'l Guard property; 40°12'N, 77°10'W, Carlisle Quadrangle, USGS. **Continuity:** Established 1978, 4 consecutive years. **Size:** 7.54 ha = 18.62 acres. **Description of Plot:** See AB 33:74 (1979). **Weather:** Normal temperatures and precipitation. Temperatures ranged from 14-22°C. **Coverage:** May 30; June 11, 15, 17, 21, 24, 28; July 2, 8; 0600-1030. Total man-hours 14. **Census:** Gray Catbird, 7.5 (100, 40); Song Sparrow, 7 (93, 98); Am. Robin, 5 (66, 27); House Wren, 4 (53, 21); Cardinal, 2.5; Willow Flycatcher, 2; Starling, 2; Com. Yellowthroat, 2; Brown-headed Cowbird, 2; Field Sparrow, 2; Yellow Warbler, 1.5; Mourning Dove, 1; Com. Flicker, 1; Downy Woodpecker, 1; Blue Jay, 1; Brown Thrasher, 1; Wood Thrush, 1; N. Oriole, 1; Yellow-billed Cuckoo, 0.5; Am. Goldfinch, 0.5; Mockingbird, +; Com. Grackle, +; House Finch, +. **Total:** 23 species; 45.5 territorial males or females ($604/\text{km}^2$, 244/100 acres). **Visitors:** Green Heron, Ring-necked Pheasant, Rock Dove, Chimney Swift, Barn Swallow, Great Crested Flycatcher, E. Wood Pewee, Com. Crow, Red-winged Blackbird, Indigo Bunting. **Remarks:** Very typical year. Previous 3 years' averages are 22 species and 44 territorial pairs. This year's 23 species and 45.5 pairs is quite close to other years. Only noteworthy changes were sharp rise in House Wrens, disappearance of Yellow-breasted Chat, and decline in Com. Yellow-throats.—*BRIAN F. ROLFINKE, 1013 Harriet St, Carlisle, PA 17013.*

98. RED OAK-AMERICAN BASSWOOD SAVANNAH. — **Location:** Ontario; Halton-Norfolk Regional Municipality, Port Rowan, 5 mi E of Long Point Prov. Park on Courtright Ridge; 42°33'N, 80°17'W, Big Rice Bay. **Continuity:** Established 1979; 2 intermittent years. **Size:** 7.5 ha = 18.5 acres. **Description of Plot:** See AB 34:65 (1980). **Weather:** Normal June conditions; 7 counts

clear, 1 overcast, temperature 15°-25°C, light winds from SW. **Coverage:** June 12, 16-20, 26, 28; 0500-0900 EST. **Census:** Red-winged Blackbird, 31 (414, 168); Tree Swallow, 16 (214, 86); Starling, 12 (160, 65); Com. Grackle, 10 (134, 54); E. Kingbird, 5 (67, 27); E Wood Pewee, 4 (53, 22); N. Oriole, 3 (40, 16); Blue-winged Teal, 2; Com. Yellowthroat, 2; Song Sparrow, 2; Mallard, 1; Mourning Dove, 1; Great Horned Owl, 1; House Wren, 1; Cedar Waxwing, 1; Yellow Warbler, 1; Wood Duck, +; Great Crested Flycatcher, +. **Total:** 18 species, 93 territorial males ($1242/\text{km}^2$, 503/100 acres). **Visitors:** Am. Kestrel, Rock Dove, Belted Kingfisher, Barn Swallow, Blue Jay. **Remarks:** Nests found: Wood Duck, Great Horned Owl, E. Kingbird, Tree Swallow, Starling, Red-winged Blackbird, N. Oriole. The density of pewees has declined to 47% of the 1979 figure. However, Red-winged Blackbird and Tree Swallow densities have increased by 32% and 62% respectively.—*CHRISTOPHER LEMIEUX, Long Point Bird Observatory, Port Rowan, Ont., Canada N0E 1M0.*

99. REGENERATING OLD FIELD WITH HAWTHORN-PINE PLANTATION. — **Location:** Ontario; 4 mi W of Milton, Hilton Falls Conservation Area (Halton Region Conservation Authority Property), 30 M 12/d ed. 1 (Milton) grid #832176, 43°30'30"N, 79°58'10"W. **Continuity:** New (1980). **Size:** 7.3 ha = 17.7 acres (measured with tape on ground). **Description of Plot:** A heterogeneous mix of hawthorn (*Crataegus* sp.) and Red Pine (*Pinus resinosa*). The N half has more hawthorn and the S half more Red Pine. The pine was planted in the early 1970s and most trees are less than 3 in. although in some areas many are 3-6 in. In places both the pine and hawthorn are so dense as to be impenetrable. Other trees encountered are Scotch Pine (*P. sylvestris*), (2 trees); White Birch (*Betula papyrifera*), 3; apple (*Malus* sp.), 2; Butternut (*Juglans cinerea*), 1; and Red Maple (*Acer rubrum*), 1. A shrub layer is lacking and the herbaceous layer is dominated by tall grasses, Canada Goldenrod (*Solidago canadensis*) and Wild Bergamot (*Monarda fistulosa*). The soil layer is very thin and in several places the limestone bedrock is exposed. Because of the immaturity of the vegetation, application of the recommended vegetation analysis (James and Shugart, AB 24:727-736 (1970) is deemed inappropriate. **Edge:** One edge is bordered by a gravel access road that separated the plot from a mixed wood and old orchard. Other edges are bordered variously by old fields in a more advanced stage of succession with aspen and more White Birch, and mature maple woods. **Topography:** Flat. **Elevation:** 1000 ft (308 m). **Weather:** Generally good visibility, breeze slightly inhibiting on 3 trips. **Coverage:** 1980: May 29; June 6, 13, 14, 21, 27; July 1, 5, 10; 8 trips, 0600-0900, and 1, 1835-2130. Total man-hours: 23.5. **Census:** Am. Redstart, 18.5 (253.4, 104.5); Gray Catbird, 16 (219.2, 90.4); Field Sparrow, 8 (109.6, 45.2); Mourning Dove, 4 (54.8, 22.6); Am. Goldfinch, 4; Am. Robin, 3.5 (48.0, 19.8); Great Crested Flycatcher, 3 (41.1, 17.0); Cedar Waxwing, 3; Golden-winged Warbler, 3; Chipping Spar-

row, 3, N Oriole, 2.5, Rufous-sided Towhee, 2.5; Brown Thrasher, 2; Blue-winged Warbler, 2; Ruffed Grouse, 1; Blue Jay, 1; Brewster's Warbler, 1; Yellow Warbler, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Ruby-throated Hummingbird, 0.5; E. Phoebe, 0.5; Brown-headed Cowbird, see Remarks; Turkey Vulture, +; Com. Flicker, +; Downy Woodpecker, +; Least Flycatcher, +; Starling, +. **Total:** 30 species; 84 territorial males or females ($1150.7/\text{km}^2$, 474.6/100 acres). **Visitors:** Black-billed Cuckoo, E. Kingbird, E. Wood Pewee, Rough-winged Swallow, Com. Crow, Yellow-throated Vireo, Red-eyed Vireo, Warbling Vireo, Tennessee Warbler, Bobolink, E. Meadowlark, Song Sparrow. **Remarks:** Nests found: Gray Catbird, 3; Mourning Dove, 1; Cedar Waxwing, 1; Brown Thrasher, 1; Brewster's Warbler, 1. Of the 18.5 Am. Redstart territories 13 were found in one area of approximately 2 ha. Density figures for this 2 ha area are $650/\text{km}^2$ (= 268/100 acres) which are considerably higher than those derived for this species when counting territories across the whole plot. This plot is well known for its populations of Blue-winged and Golden-winged warblers and their hybrids. No attempt was made to determine Brown-headed Cowbird density because of the unsuitability of the methodology. Total Brown-headed Cowbird registrations were 33, mean registrations/trip were 3.7 and registrations for this species were recorded on all 9 trips. We are indebted to the Halton Region Conservation Authority for permission to publish this study. Thanks to I.S. Liepins for assistance in setting out the transects.—*T.N. TOBIAS, School of Urban and Regional Planning, Univ. of Waterloo, Waterloo, Ont. and M.J. SHARP, Dept. of Botany and Genetics, Univ. of Guelph, Guelph, Ont.*

100. URBAN PARK WITH POND. — **Location:** Ontario, Waterloo Region, Kitchener, Lakeside Park, E portion, near Stirling and Greenbrook Ave.; 43°25'55"N, 80°29'45"W. **Continuity:** New. **Size:** 10.9 ha = 27 acres (approximately rectangular 900 × 1300 ft. measured from survey map). **Description of Plot:** Contains nearly half of an urban park including 1.3 ha of a pond. Along the N pond shore is a small wetland complex supporting growths of Cat-tail (*Typha latifolia*) and Burreed (*Sparganium* sp.). North of this is an old field community dominated by Com. Buckthorn (*Rhamnus cathartica*), Tartarian Honeysuckle (*Lonicera tatarica*), Elderberry (*Sambucus canadensis*), Jewelweed (*Impatiens capensis*), goldenrod (*Solidago* spp.) and Raspberry (*Rubus idaeus*). The extreme E section of the plot contains an abandoned gravel quarry (1.2 ha) which has been filled and is grown over in grasses and weeds which are mowed twice each summer. The remainder of the site (8.4 ha) is covered by a mix of successional species. Here the dominant tree, shrubs and vines in order of decreasing abundance are: Balsam Poplar (*Populus balsamifera*), Box-elder (*Acer negundo*), Quaking Aspen (*P. tremuloides*), Staghorn Sumac (*Rhus typhina*), Choke Cherry (*Prunus virginiana*), Am. Elm (*Ulmus americana*), Black Walnut (*Juglans*

nigra), Black Cherry (*P. serotina*), Alternate-leaved Dogwood (*Cornus alternifolia*), Raspberry, Riverbank Grape (*Vitis riparia*), and Virginia Creeper (*Parthenocissus quinquefolia*). Plants most prominent in the understory include: Starry Solomon's-Seal (*Smilicina stellata*), Enchanter's Nightshade (*Circaea quadrangularis*), Jewelweed, Poison Ivy (*Rhus radicans*), Wild Cucumber (*Echinocystis lobata*) and Catnip (*Nepeta cataria*). **Topography:** Generally flat, steep rise along E margin. **Elevation:** 1090 ft **Weather:** 18-26°; mostly sunny and warm **Coverage:** May 21-22, 31; June 3, 8, 12, 16-17, 20, 26, 29-30; July 1, 8; 1900-2145 hours Total man-hours: 27. **Census:** Gray Catbird, 5 (46, 19); Red-winged Blackbird, 5, Com. Grackle, 5; Song Sparrow, 5; Mallard, 3 (27, 11); Mourning Dove, 3; Am. Robin, 3, Cardinal, 3; Cedar Waxwing, 2; Starling, 2, N Oriole, 2; Am. Goldfinch, 2; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Downy Woodpecker, 1; E. Kingbird, 1; Least Flycatcher, 1; Blue Jay, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; Warbling Vireo, 1; Yellow Warbler, 1; Com. Yellowthroat, 1, House Sparrow, 1; Orchard Oriole, 1, Indigo Bunting, 1. **Total:** 26 species; 54 territorial males ($494/\text{km}^2$, 200/100 acres). **Remarks:** Nests found: Gray Catbird, 2; Cardinal, 2, Mourning Dove, 1; Red-winged Blackbird, 1, E. Kingbird, 1; Blue Jay, 1. Broods of young of following species found: Mallard, 3, N Oriole, 2; Am. Robin, 2; Red-winged Blackbird, 2; Com. Grackle, 2; Black-capped Chickadee, 1; Orchard Oriole, 1. Area is used by pedestrians and cyclists. The plot is utilized regularly by a number of avian species which do not nest here Green Heron, Chimney Swift, Belted Kingfisher, Tree Swallow, Barn Swallow, Rough-winged Swallow.—*KENNETH DANCE, 132 Village Rd., Kitchener, Ont., N2M 4L2, Canada.*

101. MIXED WETLAND WITH TAMARACK AND ASPEN GROVES, SHRUBLAND AND FEN. — **Location:** Wisconsin, Waukesha Co., Falk Woods Nature Conservancy Area, 3 mi S of intersection of County Rds. A and F; 42°56'N, 88°14'W, Muskego Quadrangle, USGS. **Continuity:** Established 1977; 5 consecutive years. **Size:** 16.9 ha = 41.7 acres. **Description of Plot:** See AB 32 79-80 (1978). **Weather:** Normal temperatures and rainfall throughout the period. **Coverage:** June 6, 13, 17, 20, 25; 0600-1030. Total man-hours: 14. **Census:** Yellow Warbler, 16 (95, 38); Song Sparrow, 13 (77, 31); Red-winged Blackbird, 12 (71, 29); Com. Yellowthroat, 9 (53, 22); Veery, 7 (41, 17); Gray Catbird, 6 (36, 14); Blue-winged Warbler, 6; Swamp Sparrow, 6; Alder Flycatcher, 4 (24, 10), Black-capped Chickadee, 4; Am. Goldfinch, 4; Mourning Dove, 3 (18, 7); Com. Flicker, 3, Least Flycatcher, 3; House Wren, 3, Am. Robin, 3; Cedar Waxwing, 3; Willow Flycatcher, 2; Com. Grackle, 2; Brown-headed Cowbird (female), 2; Cardinal, 2, Indigo Bunting, 2; Rufous-sided Towhee, 2, Am. Woodcock, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Mourning Warbler, 1; Yellow-breasted Chat, 1, N Oriole, 1; Rose-breasted Grosbeak, 1; Ruby-throated Hummingbird, 0.5. **Total:** 34 species; 127.5 territorial males or females

(756/km², 306/100 acres). **Visitors:** Black-billed Cuckoo, Chestnut-sided Warbler, Ovenbird. **Remarks:** Nest located: Downy Woodpecker; fledglings noted: Blue Jay.—*BOB ADAMS, VERN AUNE (compiler), S 13 W 22167 Ridge Rd, Waukesha, WI 53186.*

102. 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 Rd 210 and St. Rt 79; 40°11'N, 82°18.5'W, Newark Quadrangle, USGS. **Continuity:** Established 1937; 43 intermittent years. **Size:** 14.16 ha = about 35 acres. **Description of Plot:** See *Bird-Lore* 39: 379-80 (1937). **Weather:** Severe rainstorms in early June caused nest destruction and delay of some first broods. **Coverage:** May 28; June 6, 23, Aug. 30. Total man-hours: 20. **Census:** Red-eyed Vireo, 8 (56, 23); Acadian Flycatcher, 6 (42, 17); Wood Thrush, 6; Am. Robin, 5 (35, 14); Scarlet Tanager, 5; E. Wood Pewee, 4 (28, 11); Cerulean Warbler, 4; House Wren, 3 (21, 9); Gray Catbird, 3; Cardinal, 3; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Kentucky Warbler, 2; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Blue Jay, 1; Carolina Chickadee, 1; Blue-gray Gnatcatcher, 1; Cedar Waxwing, 1; Warbling Vireo, 1; Louisiana Waterthrush, 1; N. Oriole, 1; Brown-headed Cowbird, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Chipping Sparrow, 1; Song Sparrow, 1. **Total:** 37 species; 82 pairs (579 km², 234/100 acres). **Remarks:** Approximate average density and slightly higher species richness characterize this year's census. Ten nests were located, a much lower number than might be expected from the field-hours devoted. Cowbird activity was low and other factors seemed to be normal.—*A.H. CLAUGUS, 228 S. Lake St, Carey, OH 43316.*

103. 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; 7 consecutive years. **Size:** 20.23 ha = 50 acres. **Description of Plot:** See *AB* 29: 1117-8 (1975). **Weather:** Fairly wet during census. **Coverage:** May 30; June 4-6, 8, 11, 13-14, 27; 0545-1200 Total man-hours: 24. **Census:** Rufous-sided Towhee, 27 (133, 54); Hooded Warbler, 14 (69, 28); Yellow-breasted Chat, 11 (54, 22); Ruby-throated Hummingbird, 5 (25, 10); White-eyed Vireo, 5; Cardinal, 5; Red-eyed Vireo, 4 (20, 8); Swainson's Warbler, 4; Kentucky Warbler, 3 (15, 6); Indigo Bunting, 3; Carolina Wren, 2; Black-and-white Warbler, 2; Am. Goldfinch, 2; Carolina Chickadee, 1; Blue-gray Gnatcatcher, 1; Worm-eating Warbler, 1; Brown-headed Cowbird, 1; Whip-poor-will, +; Yellow-billed Cuckoo, +; Pileated Woodpecker, +; Black-throated Green Warbler, +. **Total:** 21 species, 91 territorial males or females (450/km², 182/100 acres). **Remarks:** Nest

found Rufous-sided Towhee New breeding species for the study: Yellow-billed Cuckoo, Swainson's Warbler, and Black-throated Green Warbler. The most noteworthy species of this year's census were the Carolina Wren (first territories since 1976) and the Swainson's Warbler. The Swainson's Warbler is an uncommon, localized breeder in our area, preferring rhododendron thickets by streams. There were at least 6 territories of this species on or near the plot. Most were not in areas that would be considered optimum habitat. Possibly the wet spring had something to do with their sudden occurrence.—*RICHARD LEWIS, Rt. 3 Box 470, Bristol, TN 37620.*

104. DISTURBED MIXED-MESOPHYTIC WOODLAND RAVINE. — **Location:** Tennessee; Jackson Co., N end of Wash Morgan Hollow, about 1 2/3 mi N of Dodson Branch; 36°20'N, 85°32'W, Dodson Branch Quadrangle, USGS. **Continuity:** New. **Size:** 7.9 ha = 19.51 acres (rectangular, 1700 × 500 ft. measured with steel tape). **Description of Plot:** A "hollow" covered with mixed hardwoods, plus a few Red Cedars (*Juniperus virginiana*) in the N half; disturbed about 1975 by logging which affected about 12% of the plot. The largest opening is about 1/2 acre. A few logging roads run through the plot. A stream about 2-4 m wide runs N near the centerline; its flow is permanent in the S half, temporary in the N half. The flattish bottomland is about 15-20 m wide. The dominant canopy trees are Sugar Maple (*Acer saccharum*), Shagbark Hickory (*Carya ovata*), White Ash (*Fraxinus americana*), Yellow Buckeye (*Aesculus octandra*), Beech (*Fagus grandifolia*) and Chinquapin Oak (*Quercus muehlenbergii*). Saplings include many Boxelders (*Acer negundo*) in the openings, as well as most of the canopy species. Vines are numerous; wild grape (*Vitis* sp.), Virginia Creeper (*Parthenocissus quinquefolia*), Crossvine (*Anisostichus capreolata*), and Poison Ivy (*Rhus radicans*) are all frequent. The most abundant shrubs are Wild Hydrangea (*Hydrangea arborescens*), Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*) and Bladdernut (*Staphylea trifolia*). Cane (*Arundinaria gigantea*) thickets cover about 5% of the plot. The lush ground cover is very rich in species. Trees 3 in. dbh and over, based on ten 0.1 acre circular sample plots, 253/acre; total basal area 75.2 ft²/acre. Species comprising 93% of the total number of trees: Sugar Maple, 40, 16, 17, 80; dead trees, 29, 11, 7, 90; Shagbark Hickory, 24, 9, 15, 60; White Ash, 20, 8, 8, 80; elms (mostly *Ulmus americana* & *U. rubra*), 19, 8, 5, 90; Yellow Buckeye, 18, 7, 7, 70; Black Maple (*Acer nigrum*), 15, 6, 3, 60; Chinquapin Oak, 12, 5, 7, 50; Beech, 11, 4, 7, 50; Hornbeam (*Carpinus caroliniana*), 10, 4, 2, 20; *Ailanthus altissima*, 8, 3, 2, 20; Butternut Hickory (*Carya cordiformis*), 7, 3, 2, 50; Tulip-tree (*Liriodendron tulipifera*), 5, 2, 4, 30; Hop Hornbeam (*Ostrya virginiana*), 5, 2, 1, 20; Shumard Oak (*Q. shumardii*), 4, 2, 4, 40; White Basswood (*Tilia heterophylla*), 4, 2, 1, 40; Red Mulberry (*Morus rubra*), 4, 2, 1, 40. Trees by diameter size class: A (3-6 in.) 141, 56, 14.1, 19; B (6-9 in.) 61, 24, 18.3, 24; C (9-15 in.) 49, 19, 39.2 52; D (15-21 in.) 2, 1, 3.6, 5. Ground cover about 70% (summer); canopy cover about 75%; canopy height about 50-70

ft. **Edge:** Similar woods on 3 sides, to N lies open bottomland woods, some weedy fields, and a gravel road (about 100 ft from the N edge). **Topography:** Steep slopes facing E and W mostly. Some outcrops of Ordovician limestone. **Elevation:** 560-780 ft. **Coverage:** Apr. 11, 25; May 2, 16; June 3, 5, 9, 19, 27, 0830-1130, CDT. Total man-hours: over 18 **Census:** Red-eyed Vireo, 15 (190, 77); Acadian Flycatcher, 7 (88, 36); Kentucky Warbler, 6 (76, 31); Wood Thrush, 5 (89, 36); Worm-eating Warbler, 5; N. Parula, 3.5 (44, 18); Hooded Warbler, 3.5; Ruby-throated Hummingbird, 3 (38, 15); Yellow-billed Cuckoo, 2; Louisiana Waterthrush, 2; Scarlet Tanager, 2; Indigo Bunting, 2; Blue-gray Gnatcatcher, 1.5; Cerulean Warbler, 1.5; Cardinal, 1.5; Hairy Woodpecker, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; Carolina Wren, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Com. Yellowthroat, 1; Red-bellied Woodpecker, 0.5; Tufted Titmouse, 0.5; Ovenbird, 0.5; Summer Tanager, 0.5; Pileated Woodpecker, +; Brown-headed Cowbird, +. **Total:** 28 species; 69.5 territorial males or females (880/km², 356/100 acres). **Remarks:** Nests seen: hummingbird, 1; Red-eyed Vireo 1. A flood on June 7 did considerable damage to the bottomland; a new channel about 50 ft long was eroded locally. Logs were swept downstream; most low vegetation in the path of the flood was flattened. The Com. Yellowthroat was not found after this event; it was registered at the largest opening. This sheltered hollow did not suffer noticeably from last year's drought. The rich soil, presumably high in phosphate, should affect the density of the bird population, which is considerably greater than that of Census 105. Thanks to Amy Johnson.—*RICHARD W SIMMERS, JR., Box 170, Rt 6, Cookeville, TN 38501.*

105. 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:** Established 1977; 5 consecutive years. **Size:** 30 ha = 74 acres. **Description of Plot:** See *AB* 32: 80 (1978) and 33 79 (1979). **Changes:** Last year's drought apparently caused the death or dieback of a fair number (perhaps 0.5%) of trees, especially Hornbeams (*Carpinus*); many blackberry (*Rubus* spp.) patches were badly injured also. Tick Trefoils (*Desmodium* spp.), Bush Clovers (*Lespedeza* spp.) and Winged Sumac (*Rhus copallina*) have markedly increased since 1977. Continued growth and succession in much of the field and brush areas has occurred. **Weather:** No late killing frosts; dry at times but no real drought this year. Heavy rains in early June caused minor flooding. Temperatures during trips 37°-93°F (3-34°C). **Coverage:** Apr. 12, 18-19, 22, 27, May 1, 3, 6, 13, 21-22, 24, 29; June 4-5, 14, 17, 21, 28; 0446-1150. Total man-hours: 45. **Census:** Red-eyed Vireo, 17.5 (58, 24); Blue-gray Gnatcatcher, 7.5 (25, 10); Field Sparrow, 6.5 (22, 9); Prairie Warbler, 6 (20, 8); Indigo Bunting, 6; Yellow-breasted Chat, 5 (17, 7); Kentucky Warbler, 4.5 (15, 6); Cardinal, 4 (13, 5); White-eyed Vireo, 3.5 (12, 5); Ovenbird, 2.5; Carolina Chickadee, 2; Tufted Tit-

mouse, 2, Black-and-white Warbler, 2, Worm-eating Warbler, 2; Com. Yellow-throat, 2; Scarlet Tanager, 2; Yellow-billed Cuckoo, 1.5; Whip-poor-will, 1.5; Hooded Warbler, 1.5; Rufous-sided Towhee, 1.5; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; E. Phoebe, 1; Acadian Flycatcher, 1; Wood Thrush, 1; Yellow-throated Vireo, 1; Brown-headed Cowbird, 1; Summer Tanager, 1; Am. Goldfinch, 1; Broad-winged Hawk, 0.5; Screech Owl, 0.5; Pileated Woodpecker, 0.5; Hairy Woodpecker, 0.5; White-breasted Nuthatch, 0.5; Carolina Wren, 0.5; Mourning Dove, +; E. Wood Pewee, +; E. Bluebird, +. **Total:** 38 species; 93 territorial males or females ($311/\text{km}^2$, 126/100 acres). **Visitors:** Turkey Vulture, Chimney Swift, Barn Swallow, Purple Martin, Com. Crow, Gray Catbird, Golden-winged Warbler, Am. Redstart, Chipping Sparrow, Song Sparrow. **Remarks:** Nests or nest-holes found: phoebe, 1; chickadee, 1. Increases for several species (notably gnatcatcher, Kentucky Warbler, Ovenbird, and Field Sparrow) are roughly balanced by decreases for other species (notably Acadian Flycatcher, Wood Thrush, White-eyed Vireo, Yellow-throated Vireo, Com. Yellowthroat, and towhee). Two pairs of Broad-winged Hawks had territories (counted as 1/3 each) partially within the plot, vs. 1 pair last year. A pair of Chipping Sparrows was seen (male singing) late in March near the house; subsequently a male Chipping Sparrow was heard May 1 near the NW corner. The resident and rather tame Field Sparrows have so far excluded the "chippy" from breeding here.—*RICHARD W. SIMMERS, JR., Box 170, Rt 6, Cookeville, TN 38501.*

106. SUBURBAN CEMETERY. — **Location:** Alabama, Jefferson Co., Birmingham, Oakland Cemetery, immediately NE of intersection of Pike and Warrior Rds in Ensley section; $33^\circ 29' \text{N}$, $86^\circ 54' \text{W}$, Bessemer Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 15 ha = 37 acres. **Description of Plot:** See AB 34: 18-19 (1980). **1980: Weather:** As of May 31, deficiency in mean temp. was 204°F and excess precip. was 16.07 in. aided by a record March precip. of 15.88 in. The hot, dry summer swung the pendulum in the opposite direction so that by September 30 our annual excess in temp. was 212°F and the excess in precip. was reduced to 12.18 in. **Coverage:** May 21 to Aug. 12; 0800-1800. Total man-hours: 36.5. **Census:** 1980: Starling, 17 (114, 46); Am. Robin, 16 (107, 43); Blue Jay, 12 (80, 32); Mockingbird, 9 (60, 24); House Sparrow, 9; Cardinal, 9; Rufous-sided Towhee, 8 (53, 22); Com. Grackle, 4 (27, 11); Mourning Dove, 2; Chimney Swift, 1; Carolina Wren, 1; Wood Thrush, 1; Brown-headed Cowbird, 1; Am. Woodcock, +; Rock Dove, +; Com. Flicker, +; Red-bellied Woodpecker, +; Red-headed Woodpecker, +; Downy Woodpecker, +; Great Crested Flycatcher, +; Purple Martin, +; Carolina Chickadee, +; Tufted Titmouse, +; Brown Thrasher, +; N. Parula, +; E. Meadowlark, +; Red-winged Blackbird, +. **Total:** 26 species; 90 territorial males ($601/\text{km}^2$, 243/100 acres). **1981: Weather:** A very dry and warm spring allowed greater than normal pollination and a bumper crop of fruits and nuts. Summer was dry and warm

and September cool and dry so that it ended with about normal temp. for the year but a deficiency of 10.65 in. for the year. **Coverage:** May 21 to Aug. 12; 0800-1800. Total man-hours: 36.5. **Census:** 1981: Starling, 16 (107, 43); House Sparrow, 15 (100, 41); Cardinal, 10 (67, 27); Blue Jay, 9 (60, 24); Mockingbird, 9; Rufous-sided Towhee, 9; Am. Robin, 6 (40, 16); Mourning Dove, 4 (27, 11); E. Wood Pewee, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Rock Dove, +; Com. Flicker, +; Red-bellied Woodpecker, +; Red-headed Woodpecker, +; Downy Woodpecker, +; Chimney Swift, +; Great Crested Flycatcher, +; Purple Martin, +; Carolina Chickadee, +; Tufted Titmouse, +; Carolina Wren, +; Brown Thrasher, +; Wood Thrush, +; N. Parula, +; E. Meadowlark, +; Red-winged Blackbird, +. **Total:** 27 species; 81 territorial males ($541/\text{km}^2$, 219/100 acres). **Remarks:** This tract is censused throughout the year; in 1980, 20 of 26 breeding species were present all year, in 1981 it was 21 of 27 breeding species.—*THOMAS A. IMHOF, 1036 Pike Rd, Birmingham, AL 35218.*

107. TALL GRASS PRAIRIE. — **Location:** Illinois, McLean Co., 6 mi S Gridley; T25N, R2E, SE 1/4, NW 1/4, Sec 5, $40^\circ 40' \text{N}$, $88^\circ 54' \text{W}$, Normal Quadrangle, USGS. **Continuity:** Established 1976; 6 consecutive years. **Size:** 12.1 ha = 30 acres. **Description of Plot:** See AB 31: 88-89 (1977). The site was originally described as forage grass meadow, but has been planted to native prairie. Annual forbs, however, still constitute an appreciable amount of the cover. **Coverage:** June 2-3, 18, 21, 23. Total man-hours: 10. **Census:** Red-winged Blackbird, 20 (165, 67); Dickcissel, 8 (66, 26); Com. Yellowthroat, 2; E. Meadowlark, 2; Ring-necked Pheasant, +; E. Kingbird, +; Barn Swallow, +; Com. Grackle, +; Indigo Bunting, +. **Total:** 9 species; 32 territorial males ($264/\text{km}^2$, 107/100 acres). **Remarks:** The Dickcissel population was the highest ever (6, 1, 3, 6, 3, in past years), probably in response to the present weedy nature of the prairie. Red-winged Blackbirds were nearly the same as in years past (25 females, this year). Short-billed Marsh Wrens have appeared in only 1 of 6 years, and no Savannah or Grasshopper sparrows have been recorded. A small Bobolink population resided until the meadow was removed.—*DALE E. BIRKENHOLZ, Dept. of Biological Sciences, Ill. State Univ., Normal, IL 61761.*

108. KENTUCKY BLUE GRASS PRAIRIE. — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 12, T142N, R68W, $47^\circ 8' \text{N}$, $99^\circ 14' \text{W}$, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 10 consecutive years. **Size:** 4.86 ha = 12 acres. **Description of Plot:** See AB 26: 972 (1972). Last subjected to a prescribed burn in spring, 1977. **Weather:** The preceding fall and winter were relatively dry, and the dry spring caused wetlands on the Woodworth Station to be in poor condition. Precipitation did not come until May 24; totals for May and June were somewhat below normal, 1.35 and 3.5 in., respectively. Temperatures in May were below normal, with average extremes of 39° and 59°F . June temperatures were well below normal; the mean low was 48° , the mean

high, 66°F . **Coverage:** May 18-19, June 11-12, 15-16, 24; 0630-1140, CDT. Total man-hours 3. **Census:** Bobolink, 1.5; Red-winged Blackbird, 1.5; E. Kingbird, 1; W. Meadowlark, 1; Brown-headed Cowbird, 0.5 (female), Mallard, +; Gadwall, +; Blue-winged Teal, +; Upland Sandpiper, +; Black Tern, +. **Total:** 10 species; 5.5 territorial males or females ($113/\text{km}^2$, 46/100 acres). **Visitors:** Am. Bittern, Com. Snipe, Willet, Barn Swallow, Yellow-headed Blackbird, Com. Grackle. **Remarks:** One E. Kingbird nest was found.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES, and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

109. MIXED PRAIRIE I. — **Location:** North Dakota; Stutsman Co., NE quarter of Sec. 11, T142N, R68W; $47^\circ 8' \text{N}$, $99^\circ 15' \text{W}$, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 10 consecutive years. **Size:** 10 ha = 24.7 acres. **Description of Plot:** See AB 26: 972 (1972). Most wetlands were nearly dry throughout the period. **Weather:** See Census 108. **Coverage:** May 18-19, June 6, 11, 15-16, 23-24; 0605-1105, CDT. Total man-hours: 9.7. **Census:** Clay-colored Sparrow, 6.5 (65, 26); Willow Flycatcher, 2.5, Com. Yellowthroat, 2.5; Red-winged Blackbird, 2.5; W. Meadowlark, 1.5; Gadwall, 1, E. Kingbird, 1; Yellow Warbler, 1; Bobolink, 1; Brown-headed Cowbird, 1 (female), Mallard, 0.5; Savannah Sparrow, 0.5; Blue-winged Teal, +; Sharp-tailed Grouse, +; Com. Snipe, +; Gray Catbird, +; Am. Goldfinch, +. **Total:** 17 species; 21.5 territorial males or females ($215/\text{km}^2$, 87/100 acres). **Visitors:** N. Shoveler, Marsh Hawk, Sora, Killdeer, Upland Sandpiper, Mourning Dove, Long-eared Owl, Com. Nighthawk, W. Kingbird, Horned Lark, Barn Swallow, Brown Thrasher, Cedar Waxwing, Yellow-headed Blackbird, Com. Grackle, Grasshopper Sparrow, Song Sparrow. **Remarks:** Nests found: Gadwall, 2; Clay-colored Sparrow, 1.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES, and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

110. MIXED PRAIRIE II. — **Location:** North Dakota; Stutsman Co., SW quarter of Sec. 1, T142N, R68W, $47^\circ 8' \text{N}$, $99^\circ 15' \text{W}$, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 10 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26: 972-973 (1972) and 32: 81-82 (1978). This plot was burned in fall 1971, spring 1976, and spring 1979. **Weather:** See Census 108. **Coverage:** May 19; June 11-12, 15-16, 24; 0605-1110, CDT. Total man-hours 3.3. **Census:** Red-winged Blackbird, 1.5, Blue-winged Teal, 1; W. Kingbird, 0.5, Com. Yellowthroat, 0.5; Bobolink, 0.5, W. Meadowlark, 0.5; Brown-headed Cowbird, 0.5 (female); Killdeer, +; Com. Snipe, +; Upland Sandpiper, +; Marbled Godwit, +; Clay-colored Sparrow, +. **Total:** 12 species, 5 territorial males or females ($82/\text{km}^2$, 33/100 acres). **Visitors:** Mallard, Gadwall, E. Kingbird, Barn Swallow, Cliff Swallow, Com

Gackle, Grasshopper Sparrow—*DOUGLAS H. JOHNSON, CRAIG A. FAANES and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

111. MIXED PRAIRIE III. — **Location:** North Dakota; Stutsman Co., NW quarter of SW quarter of Sec. 6, T142N, R67N, 47°9'N, 99°14'W, Golden Quadrangle, USGS. **Continuity:** Established 1972; 10 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26: 973 (1972) and 33: 80 (1979). **Weather:** See Census 108. **Coverage:** May 19; June 11-12, 15-16, 22, 24; 0525-1110, CDT. Total man-hours: 4.3. **Census:** Grasshopper Sparrow, 2; W. Meadowlark, 1; Clay-colored Sparrow, 1; Brown-headed Cowbird, 0.5 (female); Upland Sandpiper, +; W. Kingbird, +; Red-winged Blackbird, +. **Total:** 7 species; 4.5 territorial males or females ($74/\text{km}^2$, 30/100 acres). **Visitors:** Am. Bittern, Mallard, Sharp-tailed Grouse, Willet, Com. Nighthawk, E. Kingbird, Com. Yellowthroat, Am. Goldfinch, Baird's Sparrow. **Remarks:** Nest found: W. Meadowlark.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

112. 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; 10 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26: 973-974 (1972). This plot was last burned in spring 1979. All wetlands contained little water. **Weather:** See Census 108. **Coverage:** May 18-19; June 11, 15, 22, 24, 0710-1100 CDT. Total man-hours: 4.5. **Census:** Bobolink, 1.5; W. Meadowlark, 1.5; Grasshopper Sparrow, 1; Clay-colored Sparrow, 1; Red-winged Blackbird, 0.5; Brown-headed Cowbird, 0.5 (female); Blue-winged Teal, +; Upland Sandpiper, +; Horned Lark +; Com. Yellowthroat, +. **Total:** 10 species; 6 territorial males or females ($98/\text{km}^2$, 40/100 acres). **Visitors:** Gadwall, Gray Partridge, Willet, Marbled Godwit, E. Kingbird, W. Kingbird, Barn Swallow, Com. Gackle.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

113. 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; 10 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26: 974 (1972) and 32: 82 (1978). **Weather:** See Census 108. **Coverage:** May 18-19; June 6, 11-12, 15, 22, 24; 0630-1200, CDT. Total man-hours: 5.8. **Census:** Grasshopper Sparrow, 3 (49, 20); Bobolink, 2; E. Kingbird, 1; Brown-headed Cowbird, 1 (female); Upland Sandpiper, 0.5; W. Meadowlark, 0.5; Clay-colored Sparrow, 0.5; Killdeer, +; Willet, +; Horned Lark, +; Chestnut-collared Longspur, +. **Total:** 11 species; 8.5 territorial males or females ($139/\text{km}^2$, 56/100

acres) **Visitors:** N. Shoveler, Marsh Hawk, Black Tern, W. Kingbird, Bank Swallow, Barn Swallow, Brown Thrasher, Loggerhead Shrike, Yellow Warbler, Yellow-headed Blackbird, Red-winged Blackbird, Com. Gackle, Am. Goldfinch, Baird's Sparrow. **Remarks:** Nests found: E. Kingbird, 1; Grasshopper Sparrow, 2.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES, and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

114. MIXED PPAIRIE 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; 6 intermittent years. **Size:** 8.7 ha = 21.5 acres. **Description of Plot:** See AB 27: 990 (1973) and 32: 82 (1978). Seven seasonal wetlands partially or entirely within the plot contained little water during the period. **Weather:** See Census 108. **Coverage:** May 19; June 12, 15-16, 22; 0555-1050, CDT. Total man-hours: 4.2. **Census:** Red-winged Blackbird, 1.5; W. Meadowlark, 1; Savannah Sparrow, 1; Grasshopper Sparrow, 1; Mallard, 0.5; E. Kingbird, 0.5; Brown-headed Cowbird, 0.5 (female); Blue-winged Teal, +; Sharp-tailed Grouse, +; Sora, +; Upland Sandpiper, +; Bobolink, +; Com. Yellowthroat, +. **Total:** 13 species; 6 territorial males or females ($69/\text{km}^2$, 28/100 acres). **Visitors:** Gadwall, Pintail, Killdeer, Mourning Dove, Short-eared Owl, W. Kingbird, Horned Lark, Barn Swallow, Yellow-headed Blackbird, Com. Gackle, Clay-colored Sparrow, Chestnut-collared Longspur.—*DOUGLAS H. JOHNSON, CRAIG A. FAANES, and JONATHAN M. ANDREW, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

115. FLOODPLAIN TALLGRASS PRAIRIE. — **Location:** Kansas; Douglas Co., portion of Baker Wetlands Research Area (Baker Univ., Baldwin). It occupies much of the NW quarter of the SW quarter of Sec. 18, T13N, R20E; 38°55'N, 95°14'W, Lawrence E Quadrangle, USGS. **Continuity:** Established 1974; 8 continuous years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AB 28: 1031-1032 (1974). **Weather:** For June, mean high 29.3 C, mean low 19.4 C; total precipitation 25.1 cm. **Coverage:** June 9, 11-12; July 5; starting at 0700 for 2 trips and at 1900 for 2. Total man-hours: 5. **Census:** Dickcissel, 14 (138, 56); Red-winged Blackbird, 8 (79, 32); Com. Yellowthroat, 6 (59, 24); E. Meadowlark, 2; Bobwhite, +. **Total:** 5 species; 30 territorial males ($297/\text{km}^2$, 120/100 acres). **Remarks:** Visitors and aerial foragers included: Turkey Vulture, Killdeer, Mourning Dove, Yellow-billed Cuckoo, Chimney Swift, E. Kingbird, Barn Swallow, Purple Martin, Am. Robin, Starling, Orchard Oriole, Com. Gackle, Indigo Bunting, Am. Goldfinch. One Red-winged Blackbird nest found. Heights of vegetation: 75 cm on June 9, 160 cm on July 5. Tornado touched down June 19 within 200 m of plot but no wind damage noted. Thanks to Ivan Boyd for permission to study the area. Mark Blair aided census.—*PETER E. LOWTHER, Dept. Biology, Univ. Northern Iowa, Cedar Falls, IA*

50614, and DAVID E. SEIBEL, Museum of Natural History, Univ. Kansas, Lawrence, KS 66045.

116. IMPROVED PASTURE AND OAK-PINE FOREST. — **Location:** Oklahoma, Delaware Co., 3.5 mi S of Jay; 36°22'N, 94°48'W. Jay Quadrangle, USGS. **Continuity:** Established 1979; 3 consecutive years. **Size:** 9.11 ha = 22.5 acres. **Description of Plot:** See AB 34: 70-71 (1980). **Weather:** See Census 146. **Coverage:** May 6, 11, 18, 28, June 5, 8, 19, 27, 29; July 6, 27; 0520-1015 Total man-hours: 26.5. **Census:** Indigo Bunting, 7 (77, 31); Yellow-billed Cuckoo, 5 (55, 22); Tufted Titmouse, 5; Field Sparrow, 4 (49, 20); Downy Woodpecker, 3 (33, 13), Great Crested Flycatcher, 3; Carolina Chickadee, 3; White-breasted Nuthatch, 3; Blue-gray Gnatcatcher, 3; Brown-headed Cowbird, 3; Cardinal, 3; Blue Grosbeak, 3; Chipping Sparrow, 3; E. Meadowlark, 2 (5, 5); Hairy Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; E. Bluebird, 2; Starling, 2; Red-eyed Vireo, 1.5; Prairie Warbler, 1.5; Summer Tanager, 1.5; Red-bellied Woodpecker, 1; E. Kingbird, 1; Scissor-tailed Flycatcher, 1; Black-and-white Warbler, 1; Am. Goldfinch, 1. **Total:** 27 species; 70.5 territorial males ($774/\text{km}^2$, 313/100 acres). **Visitors:** Mourning Dove, Pileated Woodpecker, Purple Martin, Am. Robin, Pine Warbler. **Remarks:** First known nesting of Scissor-tailed Flycatcher in small pastures typical of area.—*FREDERICK M. BAUMGARTNER, ROGER S. LAWSON, LORI A. LANGSTON, MARYANNE B. PITTS, Little Lewis Whirlwind Nature School and Sanctuary, Rte. 2, Jay, OK 74346.*

117. 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; 10 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 26: 976-977 (1972). **Weather:** Mild. **Coverage:** Apr. 11, 21, 28; May 5, 11, 20, 25; June 1, 8, 17, 29; 0630-1140, CDT. Total man-hours 37. **Census:** Blue-gray Gnatcatcher, 23 (57, 23); Indigo Bunting, 14 (35, 14); Cardinal, 10 (25, 10); Red-winged Blackbird, 7 (17, 7); Yellow-breasted Chat, 6 (15, 6); Yellow-billed Cuckoo, 5 (12, 5); Com. Yellowthroat, 5; Brown-headed Cowbird, 5; Field Sparrow, 5; Ruby-throated Hummingbird, 4 (10, 4); Red-bellied Woodpecker, 3.5 (9, 4); Carolina Chickadee, 3.5; E. Wood Pewee, 3 (7, 3); Red-eyed Vireo, 3; Dickcissel, 3; Am. Goldfinch, 3; Downy Woodpecker, 2 (5, 5); Great Crested Flycatcher, 2.5; Red-headed Woodpecker, 2; Blue Jay, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Brown Thrasher, 2; E. Bluebird, 2; E. Kingbird, 1; E. Phoebe, 1; Acadian Flycatcher, 1; Warbling Vireo, 1; Prothonotary Warbler, 1; N. Parula, 1; Kentucky Warbler, 1; E. Meadowlark, 1; Orchard Oriole, 1; Com. Gackle, 1; Blue Grosbeak, 1; Barred Owl, 0.5; Starling 0.5; Belted Kingfisher, +; Pileated Woodpecker, +; Scissor-tailed Flycatcher, +; Rough-winged Swallow, +; Lark Sparrow, +. **Total:** 42 species; 132 territorial males ($326/\text{km}^2$, 132/100 acres)

Visitors: Green Heron, Red-tailed Hawk, Red-shouldered Hawk, Bobwhite, Am. Woodcock, Mourning Dove, Hairy Woodpecker, Com. Crow, Am. Robin, N. Oriole, Summer Tanager, Black-and-white Warbler. **Remarks:** Spring rains failed to renew the wet areas after a 9-month drought and Red-winged females were few. An Am. Woodcock, a new species, was flushed on May 20. The Painting Bunting was absent for the first time.—ELLA DELAP, 409 N. Wyandotte, Dewey, OK 74029.

118. OAK-PINE RAVINE FOREST WITH CLEARINGS. — **Location:** Oklahoma; Delaware Co., 4 mi S of Jay; 36°22'N, 94°48'W, Lake Eucha E Quadrangle, USGS. **Continuity:** Established 1979; 3 consecutive years. **Size:** 7.4 ha = 18.3 acres. **Description of Plot:** See AB 34: 71 (1979). **Weather:** See Census 146. **Coverage:** May 5, 10, 14, 20; June 1, 11, 20; July 2, 8, 29; 0510-1000, 1425-1630. Total man-hours: 24. **Census:** Yellow-billed Cuckoo, 5 (68, 27); Carolina Chickadee, 4.5 (61, 25); Tufted Titmouse, 4.5; N. Parula, 4 (54, 22); Cardinal, 4; Indigo Bunting, 4; White-breasted Nuthatch, 3.5 (47, 19); Red-bellied Woodpecker, 3 (41, 16); Downy Woodpecker, 3; Blue-gray Gnatcatcher, 3; Kentucky Warbler, 3; Ruby-throated Hummingbird, 2; Great Crested Flycatcher, 2; Blue Jay, 2; White-eyed Vireo, 2; Red-eyed Vireo, 2; Black-and-white Warbler, 2; Brown-headed Cowbird, 2; Chuck-will's-widow, 1; Whip-poor-will, 1; Com. Crow, 1; Summer Tanager, 1. **Total:** 22 species; 59.5 territorial males ($803/\text{km}^2$, 325/100 acres). **Visitors:** Pileated Woodpecker, E. Wood Pewee, Louisiana Waterthrush, Am. Goldfinch. **Remarks:** The overall breeding population showed a small decline from 1980.—FREDERICK M. BAUMGARTNER, ROGER S. LAWSON, LORI A. LANGSTON, MARYANNE B. PITTS, Little Lewis Whirlwind Nature School and Sanctuary, Rte. 2, Jay, OK 74346.

BREEDING BIRDS OF MINNESOTA SHELTERBELTS

The following 7 censuses were established in 1979 and have been censused for 3 consecutive years. Mean minimum temperature during census periods was 54°F (range 38-64°). Coverage of all shelterbelts on Apr 25, 28; May 2, 9, 12, 16, 19, 23, 25, 30; June 2, 4, 9, 11, 18; July 8. Total trips per shelterbelt were 16, all between sunrise and 1130 and averaging 16-66 min per shelterbelt. A total of 20 species established territories in spring 1980 vs. 17 and 16 in spring 1979 and 1980, respectively. The number of pairs of Com. Grackles in 1981 was 32 vs. 142 in 1979 and 42 in 1980. Nine pairs of Mourning Doves occurred in 1981 vs. 20 in 1979 and 12 in 1980. A single pair of Gray Catbirds was noted in 1981 vs. 3.5 pairs in both 1979 and 1980. The number of pairs of Chipping Sparrows in 1981 was 12.5; only 5 and 7 pairs were observed in 1979 and 1980, respectively. A pair of Black-capped Chickadees and 13 pairs of House Wrens were present in 1981 due to the erection of nest boxes in 4 shelterbelts; neither species nested in the shelterbelts in 1979 or 1980. This study was supported by funds from the Minn. Agricultural Experi-

ment Station, the Graduate School of the Univ. of Minn. the Nat'l Rifle Association of America, the Max McGraw Wildlife Foundation, and the Frank M. Chapman Memorial Fund.—RICHARD H. YAHNER, School of Forest Resources, Penn. State Univ., University Park, PA 16802.

Am Goldfinch, Vesper Sparrow **Remarks:** Both the total number of species and the total number of territorial males increased from 6 in 1980. Nests located: Mourning Dove, 2, Black-capped Chickadee, 1; House Wren, 4, Am. Robin, 1; Song Sparrow, 1.

119. IMMATURE (1974) THREE-ROW BELT. — **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., Swine Sheep Section, 0.4 mi S of County Rd 42; 44°44'N, 93°05'W, Coates Quadrangle, USGS. **Size:** 0.21 ha = 0.515 acres. **Description of Plot:** See AB 34: 73 (1980). **Coverage:** Total man-hours: 4.3. **Census:** Com. Grackle, 2; Red-winged Blackbird, 2; Chipping Sparrow, 1.5; Am. Robin, 1. **Total:** 4 species; 6.5 territorial males ($3119/\text{km}^2$, 1262/100 acres). **Visitors:** Barn Swallow, Starling, House Sparrow, Bobolink, W. Meadowlark, Savannah Sparrow, Clay-colored Sparrow. **Remarks:** Nests located: Am. Robin, 2; Com. Grackle, 2.

120. IMMATURE (1966) FOUR-ROW BELT. — **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., Plant Pathology Section, 2.6 mi S of County Rd 42; 44°41'N, 93°06'W, Coates Quadrangle, USGS. **Size:** 0.298 ha = 0.736 acres. **Description of Plot:** See AB 34: 72 (1980). As a consequence of destruction by a summer 1980 storm, the density of the following trees was decreased from that in spring 1980: Row 1, Laurel-leaved Willow (*Salix pentandra*), from 13/acre to 4/acre; rows 2 and 3, Russian Olive (*Elaeagnus angustifolia*), from 36/acre to 33/acre. **Coverage:** Total man-hours: 9.2. **Census:** Com. Grackle, 6 (2014, 815); Mourning Dove, 2; Chipping Sparrow, 2; Brown Thrasher, 1; Am. Robin, 1; Song Sparrow, 1. **Total:** 6 species; 13 territorial males ($4365/\text{km}^2$, 1766/100 acres). **Visitors:** Ring-necked Pheasant, Com. Flicker, Barn Swallow, Blue Jay, Com. Crow, Gray Catbird, Starling, Com. Yellowthroat, House Sparrow, W. Meadowlark, Red-winged Blackbird, Brown-headed Cowbird, Rose-breasted Grosbeak, Am. Goldfinch, Clay-colored Sparrow. **Remarks:** The number of Com. Grackles decreased from 13 in 1979 and 9 in 1980. Nests located: Mourning Dove, 6; Am. Robin, 3.

121. IMMATURE (1961) NINE-ROW BELT. — **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., Agricultural Engineering Section, 1.5 mi S of County Rd 42; 44°43'N, 93°05'W, Coates Quadrangle, USGS. **Size:** 0.787 ha = 1.94 acres. **Description of Plot:** See AB 34: 72 (1980). **Coverage:** Total man-hours: 9.8. **Census:** House Wren, 4 (509, 206); Com. Grackle, 2; Chipping Sparrow, 1.5; Mourning Dove, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; Am. Robin, 1; Com. Yellowthroat, 1; Indigo Bunting, 1; Song Sparrow, 1. **Total:** 10 species; 14.5 territorial males ($1847/\text{km}^2$, 747/100 acres). **Visitors:** Ring-necked Pheasant, Com. Flicker, Least Flycatcher, Barn Swallow, Blue Jay, Com. Crow, Starling, Warbling Vireo, Red-winged Blackbird, Brown-headed Cowbird, Rose-breasted Grosbeak,

Am Goldfinch, Song Sparrow **Remarks:** Nest located: Mourning Dove, 1

123. MATURE (1949) EIGHT-ROW BELT. — **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., Sewage Section, 3.7 mi S of County Rd 42; 44°41'N, 93°05'W, Coates Quadrangle, USGS. **Size:** 0.37 ha = 0.92 acres. **Description of Plot:** See AB 34: 72 (1980). **Coverage:** Total man-hours 10.9. **Census:** Com. Grackle, 5 (1343, 543); Mourning Dove, 3 (806, 326); House Wren, 3, Am. Robin, 2; Com. Flicker, 1; Gray Catbird, 1, Warbling Vireo, 1; N. Oriole, 1; Chipping Sparrow, 1; Brown Thrasher, 0.5; Com. Yellowthroat, 0.5; Red-winged Blackbird, 0.5. **Total:** 12 species; 19.5 territorial males ($5237/\text{km}^2$, 2120/100 acres). **Visitors:** Sharp-shinned Hawk, Ring-necked Pheasant, E. Kingbird, Least Flycatcher, E. Wood Pewee, Blue Jay, Black-capped Chickadee, Cedar Waxwing, Starling, House Sparrow, Brown-headed Cowbird, Am. Goldfinch, Song Sparrow. **Remarks:** The total number of species increased from 7 in 1979 and 9 in 1980. The number of pairs of Com. Grackles decreased from 31 in 1979 and 11 in 1980. Nests located: Mourning Dove, 8, Com. Flicker, 1; House Wren, 3; Am. Robin, 3, Com. Grackle, 3.

124. MATURE (1948) FIVE-ROW BELT. — **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., North Beef Section, 0.5 mi S of County Rd 42; 44°44'N, 93°05'W, Coates Quadrangle, USGS. **Size:** 0.706 ha = 1.74 acres. **Description of Plot:** See AB 34: 72 (1980). As a consequence of destruction by a summer 1980 storm, the density of the following trees was decreased from that in spring 1980: Rows 1 and 2, Green Ash (*Fraxinus pennsylvanica*), from 388/acre to 386/acre, rows 2 and 3, Silver Maple (*Acer saccharinum*), from 323/acre to 315/acre, rows 3 and 4, Cottonwood (*Populus deltoides*), from 170/acre to 166/acre. **Coverage:** Total man-hours: 13.6. **Census:** Com. Grackle, 9 (1278, 517); House Wren, 4 (568, 230), Am. Robin, 4; Mourning Dove, 2; Chipping Sparrow, 2; Brown Thrasher, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 0.5. **Total:** 8 species; 23.5 territorial males ($3337/\text{km}^2$, 1351/100 acres). **Visitors:** Com. Flicker, E.

Kingbird, E Wood Pewee, Barn Swallow, Starling, House Sparrow, N. Oriole, Brown-headed Cowbird, Am. Goldfinch, Song Sparrow. **Remarks:** The number of Com. Grackles decreased from 58 in 1979 and 12 in 1980. Nests located: Mourning Dove, 3; House Wren, 4; Am. Robin, 4; Com. Grackle, 6.

125. MATURE (1946) FOUR-ROW BELT.

— **Location:** Minnesota; Dakota Co., Univ. of Minn. Rosemount Agricultural Experiment Sta., Poultry Section, 0.8 mi S of County Rd 42; 44°43'N, 93°03'W, Coates Quadrangle, USGS. **Size:** 0.698 ha = 1.72 acres. **Description of Plot:** See AB 34: 71-72 (1980). As a consequence of destruction by a summer 1980 storm, the density of the following trees was decreased from that in spring 1980: Rows 1 and 2, Am. Elm (*Ulmus americana*), from 415/acre to 402/acre; row 3, Jack Pine (*Pinus banksiana*), from 267/acre to 263/acre; rows 3 and 4, White Spruce (*Picea glauca*), from 356/acre to 352/acre; row 4, White Cedar (*Thuja occidentalis*), from 296/acre to 295/acre. **Coverage:** Total man-hours: 17.6. **Census:** Com. Grackle, 4 (575, 233); Song Sparrow, 3 (503, 203); Chipping Sparrow, 2.5; House Wren, 2; Am. Robin, 2; E. Kingbird, 1; Brown Thrasher, 1; Brown-headed Cowbird, 1; Fox Sparrow, 1; W. Meadowlark, 0.5; Red-winged Blackbird, 0.5; Am. Goldfinch, 0.5. **Total:** 12 species; 19.5 territorial males (2801/km², 1134/100 acres). **Visitors:** Cooper's Hawk, Ring-necked Pheasant, Mourning Dove, Ruby-throated Hummingbird, Com. Flicker, Least Flycatcher, Barn Swallow, Blue Jay, Com. Crow, Gray Catbird, Starling, Com. Yellowthroat, House Sparrow, Bobolink, N. Oriole, Rose-breasted Grosbeak, Indigo Bunting, Vesper Sparrow. **Remarks:** The number of Com. Grackles decreased from 11 in 1979 and 6 in 1980. Nests located: House Wren, 2; Am. Robin, 2.

126. RIVER BOTTOM FOREST. — **Location:** Manitoba; Headingley, 3 mi SW of village and 800 m N of Hwy 241 (4 mi W of jct of Hwys 241 and 334); 49°52'N, 97°30'W, Winnipeg 62H/14. **Continuity:** Established 1977; 5 consecutive years. **Size:** 14 ha = 34.6 acres. **Description of Plot:** See AB 33: 64 (1978). **Weather:** Warm, calm often with high humidity. **Coverage:** June 3, 6, 9, 11, 13, 19, 23, 26; 0500-0800. Total man-hours: 22. **Census:** N. Oriole, 12 (86, 35); Rose-breasted Grosbeak, 11 (79, 32); Least Flycatcher, 7 (50, 20); Am. Robin, 4 (29, 12); E. Wood Pewee, 4; Great Crested Flycatcher, 3 (21, 9); Red-eyed Vireo, 3; Yellow-throated Vireo, 1.5; Warbling Vireo, 1.5; Hairy Woodpecker, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Philadelphia Vireo, 1; Scarlet Tanager, 1; Mourning Dove, +; Black-billed Cuckoo, +; Downy Woodpecker, +; House Wren, +; Gray Catbird, +; Brown-headed Cowbird, +. **Total:** 21 species; 53 territorial males (379/km², 153/100 acres). **Visitors:** Red-tailed Hawk, Great Horned Owl, E. Kingbird, Cedar Waxwing, Orange-crowned Warbler, Yellow Warbler. **Remarks:** Nests found: Mourning Dove, Am. Robin, Rose-breasted Grosbeak (2) Great Horned Owl had 3 fledglings. Upstream water control structure has elimi-

nated flooding since 1977 which has enhanced ground and shrub vegetation, increasing mammalian predators at the expense of ground nesting birds and Least Flycatcher habitat.—W.H. KOONZ, Dept. of Natural Resources, 1495 St. James St., Winnipeg, Manitoba, Canada R3H 0W9.

BREEDING BIRD POPULATIONS OF SEVERAL WOODED HABITATS IN NORTHEASTERN NORTH DAKOTA

The breeding bird census results that follow were conducted to obtain baseline data to be used in determining the possible impacts of a dam and reservoir proposed for construction on the Pembina River by the U.S. Army Corps of Engineers. Areas of many census plots are smaller than recommended. This was necessary to obtain data from homogeneous habitats, and because some habitats such as the Lowland Forest type, occurred in small, isolated stands. All vegetation data were gathered according to the methods of James and Shugart *Audubon Field Notes* 24: 727-736 (1970). Throughout this report, relative dominance of tree species is basal area of a species ÷ total basal area of all species, and relative density is the number of stems of a species ÷ total number of stems of all species.

Weather data were obtained from a National Weather Service station near Cavalier, Pembina County. Precipitation total for June was 2.05 in. above normal, and in July 1.48 in. below normal. Precipitation fell on 19 days in June and 10 days in July. Temperatures during June and July were 2.4° and 1.5°F below normal. The highest temperature recorded was 93°F on July 7, the lowest 41°F on July 26.—CRAIG A. FAANES and JOANTHAN M. ANDREW, U.S. Fish and Wildlife Service, Northern Prairie Wildlife Research Center, Jamestown, ND 58401.

127. AMERICAN ELM-COTTONWOOD-BLACK ASH LOWLAND FOREST. — **Location:** North Dakota; Cavalier Co., 8 mi E Maida; W central portion, W 1/2, S 1/4, Sec. 33, T164N, R58W, 48°05'N, 98°10'W, Olga NW Quadrangle, USGS. **Continuity:** New. **Size:** 1.09 ha = 2.7 acres (rectangular shape measured from topographic map and by pacing). **Description of Plot:** Mature floodplain forest. Dominant canopy trees were Cottonwood (*Populus deltoides*), Am. Elm (*Ulmus americana*), Box-elder (*Acer negundo*), and Black Ash (*Fraxinus nigra*). Dominant shrubs included *Viburnum* sp., Red-osier Dogwood (*Cornus stolonifera*), and Choke Cherry (*Prunus virginiana*). Ground cover consisted of various grasses and Pennsylvania Sedge (*Carex pensylvanica*). An analysis of the vegetation at 5 randomly selected points, gave the following: 156 trees/acre (385/ha); total basal area 72.2 ft²/acre. Relative dominance of tree species: Am. Elm, 63%; Cottonwood, 23%; Black Ash, 8%; Box-elder, 6%. Relative density of tree species: Cottonwood, 36%; Am. Elm, 30%; Black Ash, 17%; Box-elder, 17%. Trees by diameter size class: A (3-6 in.) 42, B (6.1-9 in.) 19, C (9.1-15 in.) 7, D (15.1-21 in.) 8, E

(2.1-27 in.) 2. Shrub density, 21,200 stems/acre; ground cover, 50%; canopy cover, 73%; canopy height mean, 16.8 ft, range, 14-20 ft. **Edge:** Bounded on S and W by Pembina River, on N and E by native prairie. **Topography:** Flat but adjacent to 40-50° slope. **Coverage:** June 17-19, 30; 6 trips, 0740-1040, CDT. Total man-hours: 2.6. **Census:** Least Flycatcher, 2; Warbling Vireo, 2; Veery, 1.5, Mourning Dove, 1; Gray Catbird, 1; Yellow Warbler, 1; Brown-headed Cowbird, 1 (female); E. Kingbird, 0.5; Great Crested Flycatcher, 0.5; Cedar Waxwing, +; Song Sparrow, +. **Total:** 11 species; 10.5 territorial males or females (961/km², 389/100 acres). **Visitors:** Hairy Woodpecker, Am. Robin, Rose-breasted Grosbeak, Am. Goldfinch, Clay-colored Sparrow. **Remarks:** Drumming Ruffed Grouse used S end of plot prior to census.

128. BOX-ELDER-BLACK ASH-AMERICAN ELM LOWLAND FOREST. — **Location:** North Dakota; Cavalier Co., 6.5 mi W of Walhalla; SW corner, S 1/4, Sec. 30, T163N, R58W, 48°55'N, 98°04'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 0.81 ha = 2.0 acres. **Description of Plot:** Rectangular, measured from aerial photos and paced. Mature floodplain forest. Canopy trees were Box-elder (*Acer negundo*), Black Ash (*Fraxinus nigra*), Am. Elm (*Ulmus americana*), Quaking Aspen (*Populus tremuloides*), Bur Oak (*Quercus macrocarpa*). Dominant shrub was Red-osier Dogwood (*Cornus stolonifera*). Ground cover was primarily Wood Nettle (*Laportea* sp.). Analysis of the vegetation at 5 randomly selected points gave the following: 192 trees/acre (474/ha); total basal area 57 ft²/acre. Relative dominance of tree species Am. Elm, 42%; Box-elder, 29%; Black Ash, 28%; Quaking Aspen, 1%; Bur Oak, 0.3%, dead trees, 0.3%. Relative density of tree species: Box-elder, 44%; Black Ash, 41%, Am. Elm, 12%; Quaking Aspen, 1%; Bur Oak, 1%; dead trees, 1%. Trees by diameter size class: A (3-6 in.) 54, B (6.1-9 in.) 30, C (9.1-15 in.) 10, D (15.1-21 in.) 1, E (21.1-27 in.) 1. Shrub density, 10,400 stems/acre, ground cover, 76%; canopy cover, 84%, canopy height mean, 19 ft, range, 18-20 ft. **Edge:** Bounded on E by Pembina River, on N by road and wheat field, on W by road and Bur Oak forest, and S by aspen-ash forest. **Topography:** Flat. **Coverage:** June 7-9, 16-18, 6 trips, 0650-1140 and 2000-2100, CDT. Total man-hours: 2.5. **Census:** Yellow Warbler, 2.5; Veery, 1; Red-eyed Vireo, 1; Warbling Vireo, 1; Rose-breasted Grosbeak, 1; Clay-colored Sparrow, 1; Alder Flycatcher, 0.5, Cedar Waxwing, 0.5; Song Sparrow, 0.5, Yellow-bellied Sapsucker, +; E. Phoebe, +; Gray Catbird, +. **Total:** 12 species; 9 territorial males (1112/km², 450/100 acres). **Visitors:** Ruby-throated Hummingbird, Hairy Woodpecker, Great Crested Flycatcher, Least Flycatcher, Black-capped Chickadee, White-breasted Nuthatch, Com. Crow, Ruby-crowned Kinglet, Com. Yellowthroat, Mourning Warbler, Am. Redstart, Brown-headed Cowbird, Pine Siskin, Am. Goldfinch, Rufous-sided Towhee.

129. BOX-ELDER-COTTONWOOD-ELM-ASH LOWLAND FOREST. — **Location:** North Dakota; Cavalier Co., 8 mi W

Walhalla, most of SE 1/4, S1/2, NW 1/4, Sec. 29, T163N, R57W, 48°55'N, 98°04'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 1.3 ha = 3.2 acres. **Description of Plot:** Mature lowland forest. Tree species included Box-elder (*Acer negundo*), Cottonwood (*Populus deltoides*), Am. Elm (*Ulmus americana*), Black Ash (*Fraxinus nigra*), Hackberry (*Celtis occidentalis*), willow (*Salix* sp.), and Bur Oak (*Quercus macrocarpa*). Understory shrub dominants include Box-elder, Choke Cherry (*Prunus virginiana*), and Red-osier Dogwood (*Cornus stolonifera*). Ground cover was primarily Wood Nettle (*Laportea* sp.), and goldenrod (*Solidago* sp.). Analysis of the vegetation at 5 randomly selected points gave the following: 250 trees/acre (617.5 trees/ha); total basal area 45.4 ft²/acre. Relative density of tree species was: Box-elder, 69%; Am. Elm, 8%; willow, 9%; Cottonwood, 6.5%; Black Ash, 6.5%; Hackberry, 2%; Bur Oak, 0.8%. Relative dominance of tree species: Box-elder, 54.6%; Cottonwood, 16.7%; Am. Elm, 15.9%; Black Ash, 6.2%; willow, 4%; Hackberry, 2.2%; Bur Oak, 0.4%. Trees by diameter size class: A (3-6 in.) 99, B (6.1-9.0 in.) 18, C (9.1-15.0 in.) 7, D (15.1-21.0 in.) 1. Shrub density, 18,000 stems/acre; ground cover, 58%; canopy cover, 69%; canopy height mean, 10.3 ft, range, 8-13 ft. **Edge:** Bordered on N and S by wheat field on W by Pembina River, on E by mixed grass prairie/Bur Oak. **Topography:** Flat. **Coverage:** June 7, 9, 17-18; July 1, 6 trips, 0630-1035 and 1905-2005, CDT. Total man-hours: 3.4. **Census:** Yellow Warbler, 4.5 (347, 141); Gray Catbird, 2.5; Least Flycatcher, 2; Veery, 1.5; Clay-colored Sparrow, 1.5; Ruffed Grouse, 1; Mourning Dove, 1; House Wren, 1; Red-eyed Vireo, 1; Brown-headed Cowbird, 0.5 (female); Am. Goldfinch, 0.5; Song Sparrow, 0.5; Warbling Vireo, +; Am. Redstart, + Rufous-sided Towhee, +. **Total:** 15 species; 17.5 territorial males or females (1351/km², 547/100 acres). **Visitors:** Yellow-bellied Sapsucker, Hairy Woodpecker, Downy Woodpecker, Com. Crow, Black-billed Magpie, Black-capped Chickadee, Am. Robin.

130. BUR OAK-GREEN ASH FOREST. — **Location:** North Dakota; Cavalier Co., 9 mi E of Maida; part of W portion, SE 1/4, Sec. 33, T164N, R58W, 48°05'N, 98°09'W, Olga NW Quadrangle, USGS. **Continuity:** New. **Size:** 3.24 ha = 8.0 acres. **Description of Plot:** Mature Bur Oak-Green Ash upland forest. Tree species included Bur Oak (*Quercus macrocarpa*), Green Ash (*Fraxinus pennsylvanica*), Quaking Aspen (*Populus tremuloides*), and Cottonwood (*P. deltoides*). Dominant shrubs included Beaked Hazelnut (*Corylus cornuta*), Pin Cherry (*Prunus pensylvanica*), and Saskatoon Serviceberry (*Amelanchier alnifolia*). Dominant ground cover included Pennsylvania Sedge (*Carex pennsylvanica*). Analysis of the vegetation at 5 randomly selected points gave the following: 132 trees/acre (326/ha); total basal area 25 ft²/acre. Relative density: Green Ash, 59%; Bur Oak, 36%; Quaking Aspen, 4%; Cottonwood 3%. Relative dominance: Bur Oak, 63%; Green Ash, 36%; Quaking Aspen, 0.5%; Cottonwood, 0.5%. Trees by diameter size class: A (3-6 in.) 34, B (6.1-9.0 in.) 20, C (9.1-15.0) 12. Shrub density, 122,800 stems/acre; ground cover,

75%, canopy cover, 63%; canopy height mean, 27 ft, range, 21-33 ft. **Edge:** Bounded on all sides by similar habitat. **Topography:** Sloping from NE to SW at about 15°. **Coverage:** June 7-9, 16, 18; 6 trips, 0630-1000, CDT. Total man-hours: 5.4. **Census:** Am. Redstart 11.5 (355, 144); Ruby-throated Hummingbird, 2; Veery, 2; Red-eyed Vireo, 2; Great Crested Flycatcher, 1; Cedar Waxwing, 1; Black-and-white Warbler, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 0.5. **Total:** 10 species; 23 territorial males (710/km², 288/100 acres). **Visitors:** Red-tailed Hawk, Broad-winged Hawk, E. Phoebe, Com. Crow, Blue Jay, Gray Catbird, Yellow-throated Vireo, Red-winged Blackbird, Am. Goldfinch. **Remarks:** Two Ruby-throated Hummingbird nests were found.

131. BUR OAK-GREEN ASH THICKET. — **Location:** North Dakota; Cavalier Co., 5 mi SE Walhalla; NE 1/4, NW 1/4, NE 1/4, Sec. 33, T163N, R57W, 48°54'N, 98°02'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 4.45 ha = 11 acres. **Description of Plot:** Regenerating stand of Bur Oak and Green Ash upland forest. Tree species included Bur Oak (*Quercus macrocarpa*), and Green Ash (*Fraxinus pennsylvanica*). Shrubs primarily Saskatoon Serviceberry (*Amelanchier alnifolia*) and Bur Oak. Analysis of the vegetation at 5 randomly selected points gave the following: 32 trees/acre (79/ha); total basal area 4.4 ft²/acre. Relative density: Bur Oak, 75%; Green Ash, 25%. Relative dominance: Bur Oak, 82%; Green Ash, 18%. Trees by diameter size class: A (3-6 in.) 13, B (6.1-9.0 in.) 3. Shrub density 144,400 stems/acre; ground cover, 78%; canopy cover, 7%. Canopy height mean, 10 ft, range, 0-22. **Edge:** Bounded on the E by gravel road and lowland forest, on S and W by wheat field on N by mature Bur Oak-Green Ash forest. **Coverage:** June 16, 19-20, 29; July 2; 6 trips, 0535-1120, CDT. Total man-hours: 7. **Census:** Yellow Warbler, 13.5 (303, 123); Clay-colored Sparrow, 6 (135, 55); Mourning Dove, 4 (90, 36); Gray Catbird, 4; Com. Yellowthroat, 2.5; Veery, 2; Orange-crowned Warbler, 2; Am. Goldfinch, 1.5; Rufous-sided Towhee, 1.5; Black-capped Chickadee, 1; Cedar Waxwing, 1; Mourning Warbler, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Vesper Sparrow, 0.5; White-breasted Nuthatch, +. **Total:** 17 species; 43.5 territorial males (977/km², 395/100 acres). **Visitors:** Downy Woodpecker, Great Crested Flycatcher, House Wren, Chestnut-sided Warbler, Am. Redstart, Brown-headed Cowbird.

132. BUR OAK-GREEN ASH-QUAKING ASPEN FOREST. — **Location:** North Dakota; Cavalier Co., 8 mi WNW Walhalla; part of SE 1/4, SW 1/4, Sec. 18, T163N, R57W; 48°56'N, 98°05'W Vang Quadrangle, USGS. **Continuity:** New. **Size:** 3.08 ha = 7.6 acres. **Description of Plot:** Tree species included Quaking Aspen (*Populus tremuloides*), Bur Oak (*Quercus macrocarpa*), Green Ash (*Fraxinus pennsylvanica*), and Am. Elm (*Ulmus americana*). Dominant understory shrubs included Saskatoon Serviceberry (*Amelanchier alnifolia*), and Beaked Hazelnut (*Corylus cornuta*). Analysis of the vegetation at 5

randomly selected points gave the following: 52 trees/acre (128/ha); total basal area 8.4 ft²/acre. Relative density: Bur Oak, 38%, Green Ash, 31%; Quaking Aspen, 27%, Am. Elm, 4%. Relative dominance: Quaking Aspen, 55%, Bur Oak, 24%; Green Ash, 19%, Am. Elm, 2%. Trees by diameter size class A (3-6 in.) 23, B (6.1-9.0 in.) 1, C (9.1-15.0 in.) 2. Shrub density, 94,800 stems/acre; ground cover, 96%; canopy cover, 10%; canopy height mean, 12 ft, range, 0-21 ft. **Edge:** Bounded on N, E, and S by Bur Oak Forest, on W by similar habitat and Little North Pembina River. **Coverage:** June 16, 20, 30, July 1; 6 trips, 0600-1040, CDT. Total man-hours: 5.2. **Census:** Yellow Warbler, 7 (228, 92); Clay-colored Sparrow, 5 (163, 66); Gray Catbird, 4 (130, 53); Am. Goldfinch, 3 (98, 39); Cedar Waxwing, 2; Com. Yellowthroat, 2; Rufous-sided Towhee, 2; E. Kingbird, 1; Least Flycatcher, 1; Black-capped Chickadee, 1; Warbling Vireo, 1; Golden-winged Warbler, 1; Brown-headed Cowbird, 1 (female); Indigo Bunting, 1; Song Sparrow, 1; Ruby-throated Hummingbird, 0.5; E Phoebe, 0.5; Great Crested Flycatcher, 0.5; Veery, 0.5; Scarlet Tanager, 0.5; Am. Woodcock, +; Yellow-throated Vireo, +. **Total:** 22 species; 35.5 territorial males or females (1154/km², 467/100 acres). **Visitors:** Mourning Dove, House Wren, Black-and-white Warbler, Rose-breasted Grosbeak. **Remarks:** Two recently fledged Golden-winged Warblers were found June 30, thus establishing the first nest record for North Dakota

133. MATURE QUAKING ASPEN FOREST. — **Location:** North Dakota; Cavalier Co., 8 mi ESE Maida, part of NE 1/4, SW 1/4, Sec. 32, T164N, R58W; 48°04'N, 98°10'W, Olga NW Quadrangle, USGS. **Continuity:** New. **Size:** 4.05 ha = 10 acres. **Description of Plot:** Tree species include Quaking Aspen (*Populus tremuloides*), Bur Oak (*Quercus macrocarpa*), and Box-elder (*Acer negundo*). Understory vegetation composed primarily of Buckbrush (*Symphoricarpos occidentalis*), Green Ash (*Fraxinus pennsylvanica*) saplings, Quaking Aspen saplings, and Poison Ivy (*Rhus radicans*). Analysis of the vegetation at 5 randomly selected points gave the following: 288 trees/acre (711/ha), 44.4 ft²/acre basal area. Relative density of tree species: Quaking Aspen, 72%; Bur Oak, 7%; Box-elder, 1%; dead Quaking Aspen, 20%. Relative dominance of tree species Quaking Aspen, 72%; Bur Oak, 7%, Boxelder, 1%; dead Quaking Aspen, 20% Trees by diameter class: A (3-6 in.) 105, B (6.1-9 in.) 39. Shrub density, 26,200 stems/acre, ground cover, 62%; canopy cover, 47%, canopy height mean, 30 ft, range, 30-36 ft. **Edge:** Bounded on N by similar habitat and grassy clearing, on W by similar habitat, on S and E by Bur Oak-Green Ash forest. **Topography:** Sloping NE to SW at about 30°. **Coverage:** June 7-8, 16-17, 30; 6 trips, 0530-0945 and 1810-1930, CDT. Total man-hours 7.9. **Census:** Least Flycatcher, 8.5 (210, 85); Veery, 4.5 (111, 45); Mourning Dove, 2.5; E. Wood Pewee, 1.5; Warbling Vireo, 1.5; Yellow-bellied Sapsucker, 1; Gray Catbird, 1; Black-capped Chickadee, 1; Red-eyed Vireo, 1; Philadelphia Vireo, 1; Mourning Warbler, 1; Canada Warbler, 1; N. Oriole, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1,

Downy Woodpecker, 0.5; Cedar Waxwing, 0.5; Rose-breasted Grosbeak, 0.5; Clay-colored Sparrow, 0.5; Com. Crow, +; White-breasted Nuthatch, +. **Total:** 21 species, 30.5 territorial males ($754/\text{km}^2$, 305/100 acres). **Visitors:** Red-tailed Hawk, Ruby-throated Hummingbird, Great Crested Flycatcher, House Wren, Am. Robin, Brown-headed Cowbird, Song Sparrow. **Remarks:** Nests found: Mourning Dove, 2. The Canada Warbler pair represented the first breeding season record for this species in North Dakota since 1917.

134. QUAKING ASPEN-GREEN ASH FOREST. — **Location:** North Dakota; Cavalier Co., 6 mi SW Walhalla; SW 1/4, SW 1/4, NE 1/4, Sec. 33, T163N, R57W, 48°54'N, 98°02'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 4.05 ha = 10 acres. **Description of Plot:** Mature forest interspersed with small meadow openings across N 1/2 Tree species included Quaking Aspen (*Populus tremuloides*), Green Ash (*Fraxinus pennsylvanica*), Bur Oak (*Quercus macrocarpa*), White Birch (*Betula papyrifera*), and Am. Elm (*Ulmus americana*). Under-story vegetation mostly Beaked Hazelnut (*Corylus cornuta*), and Red-osier Dogwood (*Cornus stolonifera*). Analysis of the vegetation at 5 randomly selected points gave the following: 194 trees/acre (479/ha); 38.2 ft²/acre basal area. Relative density of tree species Quaking Aspen, 36%; Green Ash, 22%, dead Quaking Aspen, 12%; Am. Elm, 12%; White Birch, 8%; Bur Oak, 7%; dead Bur Oak, 1%; dead Am. Elm, 1%. Relative dominance of tree species: Quaking Aspen, 42.5%; Am. Elm, 18%; dead Quaking Aspen, 16%; Green Ash, 11%; Bur Oak, 4%; White Birch, 4%; dead Am. Elm, 4%; dead Bur Oak, 0.5%. Trees by diameter class: A (3-6 in.) 65, B (6.1-9 in.) 26, C (9.1-15 in.) 6. Shrub density, 45,800 stems/acre; ground cover, 92%, canopy cover, 48%; canopy height mean, 33 ft, range, 15-45 ft. **Edge:** Bounded on N by aspen shrub habitat, on E by gravel road, on S and W by Bur Oak-Am. Elm-Green Ash forest (mature). **Topography:** Sloping SW to NE at about 20°. **Coverage:** June 16-17, 19-20, 30; July 1; 6 trips, 0615-1205, CDT. Total man-hours: 6.6. **Census:** Veery, 3.5 (86, 35); Red-eyed Vireo, 3 (74, 30); Yellow Warbler, 3; Am. Goldfinch, 2.5; Least Flycatcher, 2; Black-and-white Warbler, 2; Am. Redstart, 2; Ruffed Grouse, 1.5; Black-capped Chickadee, 1.5; Clay-colored Sparrow, 1.5; Downy Woodpecker, 1; Black-billed Cuckoo, 1; Great Crested Flycatcher, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Cedar Waxwing, 1; N. Waterthrush, 1; N. Oriole, 1; Rose-breasted Grosbeak, 1; Warbling Vireo, 0.5; Com. Yellowthroat, 0.5; Scarlet Tanager, +. **Total:** 22 species, 32.5 territorial males ($803/\text{km}^2$, 325/100 acres). **Visitors:** Cooper's Hawk, Wild Turkey, Hairy Woodpecker. **Remarks:** Nest found: Downy Woodpecker.

135. BLACK ASH-QUAKING ASPEN FOREST. — **Location:** North Dakota; Pembina Co., 8.6 mi SE Walhalla; NE 1/4, NE 1/4, Sec. 36, T162N, R56W, 48°48'N, 97°50'W. **Continuity:** New. **Size:** 4.05 ha = 10 acres. **Description of Plot:** Tree

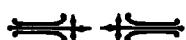
species included Quaking Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Am. Elm (*Ulmus americana*), and Black Ash (*Fraxinus nigra*). Dominant shrubs included Red-osier Dogwood (*Cornus stolonifera*), Saskatoon Serviceberry (*Amelanchier alnifolia*), and Beaked Hazelnut (*Corylus cornuta*). Analysis of the vegetation at 5 randomly selected points gave the following: 218 trees/acre (538/ha); 54.8 ft²/acre basal area. Relative density of tree species: Black Ash, 56%; Quaking Aspen, 37%; Am. Elm, 5%; White Birch, 2%. Relative dominance of tree species: Quaking Aspen, 37%; Am. Elm, 5%; White Birch, 2%. Trees by diameter class: A (3-6 in.) 74, B (6.1-9 in.) 20, C (9.1-15 in.) 13, D (15.1-21 in.) 2. Shrub density, 86,400 stems/acre; ground cover, 54%; canopy cover, 72%; canopy height mean, 45 ft, range, 40-50 ft. **Edge:** Bounded on all sides by similar habitat. **Topography:** Essentially flat; several small depressions held water. **Coverage:** June 16-17, 29; July 2, 6 trips, 0610-0910 and 1910-2025, CDT. Total man-hours: 5.7. **Census:** Red-eyed Vireo, 4 (99, 40); Veery, 3 (74, 30); Ovenbird, 2; Com. Yellowthroat, 2; Ruffed Grouse, 1; E. Wood Pewee, 1; Black-capped Chickadee, 1; Solitary Vireo, 1; Brown-headed Cowbird, 1 (female); N. Oriole, 1; Downy Woodpecker, 0.5; White-breasted Nuthatch, 0.5; Gray Catbird, 0.5; Warbling Vireo, 0.5; Scarlet Tanager, 0.5; Rose-breasted Grosbeak, 0.5; Indigo Bunting, 0.5; Am. Goldfinch, 0.5; Great Crested Flycatcher, +. **Total:** 19 species, 21 territorial males or females ($519/\text{km}^2$, 210/100 acres). **Visitors:** Broad-winged Hawk, Black-billed Cuckoo, Pileated Woodpecker, Least Flycatcher, Barn Swallow, Am. Robin, Black-and-white Warbler, N. Waterthrush.

136. RIPARIAN WILLOW SHRUB. — **Location:** North Dakota; Cavalier Co., 7 mi W Walhalla; W edge of NW 1/4, NW 1/4 Sec. 29, T164N, R57W, 48°55'N, 98°04'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 1.295 ha = 3.2 acres. **Description of Plot:** Long and narrow, not exceeding 100 ft in width at any point and following river bank. No trees recorded. Dominant shrubs included willow (*Salix* sp.), and Red-osier Dogwood (*Cornus stolonifera*). Ground cover consists of Prairie Rose (*Rosa arkansana*), and Brome Grass (*Bromus* sp.). Analysis of vegetation at 5 randomly selected points gave the following: No trees or basal area quantified; no stems > 3 in. dbh. Ground cover, 34%; canopy cover, 0%; vegetation height, 10 ft, Range 8-12 ft; shrub density, 124,800 stems/acre. **Edge:** Bounded on N by Lowland Forest, on E by wheat field, on W by Pembina River and on S by gravel road and wheat field. **Topography:** flat. **Coverage:** June 18-19, 30; 6 trips, 0615-0955 and 1815-1905, CDT. Total man-hours: 2.7 hours. **Census:** Alder Flycatcher, 6 (463, 188); Yellow Warbler, 6; Gray Catbird, 4 (309, 125); Com. Yellowthroat, 4; Song Sparrow, 3.5 (270, 109); Red-winged Blackbird, 1.5; Veery, 0.5; Warbling Vireo, 0.5; Cedar Waxwing, +; Am. Goldfinch, +; Clay-colored Sparrow, +. **Total:** 11 species; 26 territorial males ($2008/\text{km}^2$, 813/100 acres). **Remarks:** One recently fledged Alder Flycatcher was found July 21, thus establishing the first nest record for North Dakota.

137. WILLOW-SASKATOON SERVICEBERRY FLOODPLAIN THICKET. — **Location:** North Dakota; Cavalier Co., 8 mi E of Maida; part of N 1/2, NE 1/4, NE 1/4, Sec. 32, T164N, R58W, 48°59'N, 98°11'W, Oglala NW Quadrangle, USGS. **Continuity:** New. **Size:** 1.295 ha = 3.2 acres. **Description of Plot:** Shrub habitat with few trees and seasonal wet areas in S 1/4 of plot. Dominant trees included Choke Cherry (*Prunus virginiana*) and willow (*Salix* sp.). Shrubs mostly Saskatoon Serviceberry (*Amelanchier alnifolia*), willow, and Red-osier Dogwood (*Cornus stolonifera*). Analysis of vegetation at 5 randomly selected points yielded the following: 6 trees/acre (14.8/ha); total basal area 0.6 ft²/acre. Relative density: willow sp., 67%; Choke Cherry, 33%. Relative dominance of tree species: willow sp., 67%; Choke Cherry, 33%. Trees by diameter size class: A (3-6), 3. **Ground Cover:** 89%; canopy cover, 11%; canopy height mean, 8 ft, range, 3-15 ft; shrub density, 137,600/acre. **Edge:** Bounded on N by gravel road and similar habitat, on W and S by aspen forest and similar habitat and on E by Pembina River and similar habitat. **Topography:** Slightly rolling, sloping downward to E. **Coverage:** June 9, 17, 19, 30; July 1; 6 trips, 0610-1105, CDT. Total man-hours: 5.7. **Census:** Yellow Warbler, 11 (849, 344); Veery, 3 (232, 94); Alder Flycatcher, 2.5; Gray Catbird, 2.5; Clay-colored Sparrow, 2; Warbling Vireo, 1.5; N. Waterthrush, 1.5; Com. Yellowthroat, 1.5; Am. Goldfinch, 1.5; Belted Kingfisher, 1; Mourning Dove, 1; Cedar Waxwing, 1; Brown-headed Cowbird, 1 (female). **Total:** 13 species; 31 territorial males or females ($2394/\text{km}^2$, 969/100 acres) **Visitors:** Least Flycatcher, Barn Swallow, Bank Swallow, Black-capped Chickadee, Rose-breasted Grosbeak.

138. SASKATOON SERVICEBERRY THICKET. — **Location:** North Dakota, Cavalier Co., 9 mi WNW Walhalla; part of SE 1/4, NE 1/4, NE 1/4, Sec. 24, T163N, R58W, 48°56'N, 98°05'W, Vang Quadrangle, USGS. **Continuity:** New. **Size:** 1.295 ha = 3.2 acres. **Description of Plot:** Shrub habitat with E half of plot bisected by Little North Pembina River. Dominant shrub Saskatoon Serviceberry (*Amelanchier alnifolia*). Analysis of vegetation at 5 randomly selected points gave the following: No trees. Shrub density 179,800 stems/acre (almost all Saskatoon Serviceberry). Ground cover, 100%; canopy cover, 0%; vegetation height mean, 6 ft, range, 4-9 ft. **Edge:** Bordered on N and W by Bur Oak forest, on E by Bur Oak-Saskatoon Serviceberry Thicket, on S by gravel road, Little North Pembina and Pembina Rivers. **Topography:** Flat, although located in valley with 30° slopes to E and W. **Coverage:** June 9, 18; July 1-2; 6 trips, 0700-1000 and 1830-1925, CDT. Total man-hours: 2.8. **Census:** Yellow Warbler, 3 (232, 94); Clay-colored Sparrow, 2; Am. Goldfinch, 1.5; Gray Catbird, 1; Com. Yellowthroat, 1; Brown-headed Cowbird, 1 (female); Mourning Dove, +. **Total:** 7 species; 9.5 territorial males or females ($734/\text{km}^2$, 297/100 acres). **Visitors:** Ruby-throated Hummingbird, Least Flycatcher, Cedar Waxwing, Veery, Warbling Vireo, Chestnut-sided Warbler, Song Sparrow.

139. OAK-HICKORY FOREST. — **Location:** Kansas; Douglas Co., Priestley's Woods. Predominantly on NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 22, T-14S, R-20E, Baldwin City Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (irregular shape, roughly triangular, measured in acres). **Description of Plot:** Dominant canopy trees are elm (*Ulmus* spp.), Hackberry (*Celtis occidentalis*), Green Ash (*Fraxinus americana*), Bitternut Hickory (*Carya cordiformis*) and Black Walnut (*Juglans nigra*). Many of the large oaks were harvested 25-30 years ago. Most prominent in the understory are Paw Paw (*Asimina triloba*), sapling elms, and Bladdernut (*Staphylea trifolia*). Groundcover consists mainly of Coralberry (*Symporicarpos orbiculatus*), various grasses and saplings, and Stinging Nettle (*Urtica dioica*). A quantitative analysis of the vegetation gave the following results: Trees 3 in. in diameter and over, based on 13 0.1 acre circular samples, 319/acre; total basal area 158.5 ft²/acre. All trees counted (comprising 93% of the total); elm species, 62, 19, 8, 92; Hackberry, 58, 18, 14, 100; Bitternut Hickory, 30, 9, 12, 92; dead, 28, 9, 11, 92; Black Walnut, 25, 8, 11, 85; Red Mulberry (*Morus rubra*), 22, 7, 7, 77; Redbud (*Cercis canadensis*), 17, 5, 1, 62; Bur Oak (*Quercus macrocarpa*), 10, 3, 14, 70; Sycamore (*Platanus occidentalis*), 10, 3, 7, 38. Trees by diameter size class: A (3-6 in.) 172, 54, 17, 11; B (6-9 in.) 68, 21, 20, 13; C (9-15 in.) 45, 14, 30, 19; D (15-21 in.) 18, 5, 27, 17, E (21-27) 12, 4, 36, 23; F (27-33) 5, 2, 26, 17. Shrub stems/acre, 2523; ground cover 87%; canopy cover 94%; average canopy height 60 ft (range 50-90). **Edge:** A minimum 10-20 yds woodland edge was maintained during layout but, except for the SW corner which is separated from another woodland by a paved road; the other edges are pasture or cultivated fields. **Topography:** Relatively flat. **Elevation:** 920-950 ft. Located $\frac{1}{4}$ mi N of the foot of a N facing escarpment. **Weather:** Same as for "Breeding Bird Populations of Selected Oak-Hickory Forests in Northeastern Kansas," which follow. **Coverage:** June 3, 5, 9, 18, 23, 26; July 1, 3, 5; 9 trips between 0600-1100 hr. Total man-hours: 26. **Census:** Cardinal, 7 (86, 35); Yellow-billed Cuckoo, 3 (37, 15); Great Crested Flycatcher, 3; Black-capped Chickadee, 3; Indigo Bunting, 3; Red-headed Woodpecker, 2.5; Downy Woodpecker, 2.5; White-breasted Nuthatch, 2.5; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; Tufted Titmouse, 2; N. Parula, 2; Louisiana Waterthrush, 2; Kentucky Warbler, 2; Red-eyed Vireo, 1.5; Hairy Woodpecker, 1; Green Heron, +; Blue-gray Gnatcatcher, +. **Total:** 19 species; 43 territorial males (531/km², 215/100 acres). **Visitors:** Red-tailed Hawk, Great Horned Owl, Com. Crow, Red-winged Blackbird, Com. Grackle, Brown-headed Cowbird. **Remarks:** Single nests found: Yellow-billed Cuckoo, Great Crested Flycatcher. Our thanks to Nellie Holmes and Martha Boller for permission to conduct the study on their land.—*MARTIN JOYCE* (compiler) and *ROGER L. BOYD*, Biol Dept., Baker Univ., Baldwin City, KS 66006.



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

See AB 33:66-67 (1979) for a description of vegetation and topography. Overall, these 6 censuses reflected lower numbers than 1979 but about the same as 1980. Drought conditions prevailed in 1980. Noticeable species changes between 1980 and 1981 were the continued absence of Ovenbirds breeding on 4 of 6 plots, disappearance of Whip-poor-wills on 3 of the 6 grids, decreases of Kentucky Warbler, Summer Tanager, N. Parula, and the absence of Scarlet Tanager, except for a partial territory on 1 plot and as a visitor on 2 plots.

Precipitation data from Baldwin City, 2 mi S, indicate that April with 0.6 in. was very dry compared to the 40-year average of 3.46 in. May, June, July, however, each had approximately double the average precipitation. Temperature data from Lawrence, 12 mi NW, indicate temperatures were very nearly normal with a mean max of 84.5°F and mean min of 62.6° for June.

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

140. OAK-HICKORY FOREST I. — **Location:** Kansas; Douglas Co., on the Univ. of Kansas Wall Biological Reserve. Predominantly on the NW $\frac{1}{4}$, SW $\frac{1}{4}$, Section 28, T-14S, R-20E; 38°48'N, 95°12'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978. 4 consecutive years. 8.1 ha = 20 acres. **Coverage:** May 22, 29; June 9-10, 16, 19-20, 29; July 3; 0700-1100. Total man-hours: 16. **Census:** Great Crested Flycatcher, 4.5 (56, 23); Blue Jay, 4 (49, 20); Rose-breasted Grosbeak, 4; E. Wood Pewee, 3.5 (43, 18); Red-bellied Woodpecker, 3 (37, 15); Downy Woodpecker, 3; Tufted Titmouse, 3; Yellow-billed Cuckoo, 2.5; White-breasted Nuthatch, 2.5; Com. Flicker, 2; Black-capped Chickadee, 2; Cardinal, 2; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Summer Tanager, 1; Red-tailed Hawk, +; Wood Thrush, +; Red-eyed Vireo, +; Kentucky Warbler, +. **Total:** 19 species, 39 territorial males (482/km², 195/100 acres). **Visitors:** Bobwhite, Mourning Dove, Com. Crow, Tennessee Warbler, Ovenbird, Am. Redstart, Baltimore Oriole, Com. Grackle, Brown-headed Cowbird, Scarlet Tanager.

141. OAK-HICKORY FOREST II. — **Location:** Kansas; Douglas Co.; on the Univ. of Kansas Breidental Biological Reserve and Cedar Crest Wildlife Refuge (Cliff Woods). Predominantly on the NW $\frac{1}{4}$, NE $\frac{1}{4}$, Section 28, T-14S, R-20E; 38°48'N, 95°10'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 29, 31; June 9-10, 19, 24, 29; July 1, 3; between 0700-1030. Total man-hours: 15. **Census:** Tufted Tit-

mouse, 3.5 (43, 18), Yellow-billed Cuckoo, 2.5; Downy Woodpecker, 2.5; Blue Jay, 2.5, White-breasted Nuthatch, 2.5; Mourning Dove, 2; Black-capped Chickadee, 2; Great Crested Flycatcher, 2; Kentucky Warbler, 1.5; Summer Tanager, 1.5; Rose-breasted Grosbeak, 1.5; Chuck-will's-widow, 1; Com. Flicker, 1; Red-eyed Vireo, 1; Cardinal, 1, Hairy Woodpecker, +; Com. Crow, +, Wood Thrush, +. **Total:** 18 species; 28 territorial males (346/km², 140/100 acres) **Visitors:** Red-tailed Hawk, Red-bellied Woodpecker, E. Kingbird, E. Wood Pewee, Barn Swallow, Brown Thrasher, Blue-gray Gnatcatcher, N. Parula, Red-winged Blackbird, Com. Grackle, Brown-headed Cowbird, Indigo Bunting. **Remarks:** Nests found Yellow-billed Cuckoo, Chuck-will's widow, Downy Woodpecker.

142. OAK-HICKORY FOREST III. — **Location:** Kansas; Douglas Co., on the Univ. of Kansas Breidental Biological Reserve. Predominantly on the NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 28, T-14S, R-20E; 38°48'N, 95°12'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 25, 30; June 4, 16-17, 23, 29; July 3, 6; 0600-1100. Total man-hours 23.5 **Census:** Cardinal, 5 (62, 25); Black-capped Chickadee, 4.5 (56, 22); Great Crested Flycatcher, 4 (49, 20); E. Wood Pewee, 4; Yellow-billed Cuckoo, 3.5 (43, 18), Downy Woodpecker, 3.5; Tufted Titmouse, 3.5; Blue Jay, 3 (37, 15); Red-eyed Vireo, 3, Red-bellied Woodpecker, 2.5; White-breasted Nuthatch, 2.5; Kentucky Warbler, 2.5; Rose-breasted Grosbeak, 2.5; Brown-headed Cowbird, 2; Wood Thrush, 1.5, Mourning Dove, 1; Com. Flicker, 1; Red-headed Woodpecker, 1; Chuck-will's-widow, 1; N. Parula, 1; Indigo Bunting, 1, N Oriole, +. **Total:** 22 species; 53.5 territorial males (661/km², 268/100 acres). **Visitors:** Red-tailed Hawk, Ovenbird, Louisiana Waterthrush, Red-winged Blackbird, Com Grackle, Scarlet Tanager. **Remarks:** Nests found: Yellow-billed Cuckoo, Chuck-will's-widow (2), Red-headed Woodpecker, Downy Woodpecker (2), Tufted Titmouse, Cardinal (3).

143. OAK-HICKORY FOREST IV. — **Location:** Kansas; Douglas Co., Sturdy's Woods. Predominantly on the NE 1/4, NE 1/4, Section 27, T-14N, R-20E; 38°48'N, 95°10'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 22, 25, 28; June 1, 3, 5, 12, 19, 30, 0630-1130. Total man-hours: 18. **Census:** Red-eyed Vireo, 5 (62, 25); Great Crested Flycatcher, 4 (49, 20); Downy Woodpecker, 3 (37, 15), Blue Jay, 3; Yellow-billed Cuckoo, 2; Whip-poor-will, 2; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Black-capped Chickadee, 2, Tufted Titmouse, 2; White-breasted Nuthatch, 2; Wood Thrush, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2, Cardinal, 2; Mourning Dove, 1; Great Horned Owl, 1; Hairy Woodpecker, 1; Brown Thrasher, 1; Summer Tanager, 1; Rose-breasted Grosbeak, 1; Ruby-throated Hummingbird, +; Com. Flicker, +; Red-headed Woodpecker, +. **Total:** 24 species; 43 territorial males (531/km², 215/100 acres)

Visitors: Red-tailed Hawk, Barn Swallow, Com Crow, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Yellow-billed Cuckoo, Whip-poor-will (3), Downy Woodpecker, E. Wood Pewee, Wood Thrush, Red-eyed Vireo, Cardinal.

144. 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; 38°48'N, 95°09'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 27, 29; June 2, 4, 6, 14, 18, 20, 27; 0630-1130 Total man-hours: 25. **Census:** Red-eyed Vireo, 5 (62, 25); Yellow-billed Cuckoo, 3 (37, 15); Great Crested Flycatcher, 3; Blue Jay, 3; Wood Thrush, 3; Ovenbird, 3; Downy Woodpecker, 2; E. Wood Pewee, 2; Black-capped Chickadee, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; Cardinal, 2; Mourning Dove, 1; Whip-poor-will, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Louisiana Waterthrush, 1; N Oriole, 1; Summer Tanager, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Com Flicker, +; Blue-gray Gnatcatcher, +; Scarlet Tanager, +. **Total:** 26 species; 45 territorial males (556/km², 225/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Rough-winged Swallow, Gray Catbird, Am. Goldfinch. **Remarks:** Nests found: Whip-poor-will, Downy Woodpecker, Ovenbird, Kentucky Warbler (2), Cardinal.

145. 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-30E; 38°48'N, 95°09'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 27, 29; June 2, 4, 6, 14, 18, 20, 27; 0630-1130 Total man-hours: 24. **Census:** Blue Jay, 4 (49, 20); Great Crested Flycatcher, 3 (37, 15); Red-eyed Vireo, 3; Ovenbird, 3; Yellow-billed Cuckoo, 2; Whip-poor-will, 2; Downy Woodpecker, 2; E. Wood Pewee, 2; Black-capped Chickadee, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Wood Thrush, 2; Brown-headed Cowbird, 2; Summer Tanager, 2; Rufous-sided Towhee, 2; Mourning Dove, 1; Chuck-will's widow, 1; Com. Flicker, 1; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Brown Thrasher, 1; Kentucky Warbler, 1; Cardinal, 1; Great Horned Owl, +; N. Oriole, +; Com. Grackle, +. **Total:** 26 species; 43 territorial males (531/km², 215/100 acres). **Visitors:** Red-tailed Hawk, Com. Crow, Am. Robin, Am. Goldfinch. **Remarks:** Nests found: Chuck-will's-widow, Whip-poor-will, Hairy Woodpecker, Downy Woodpecker, E. Wood Pewee, Red-eyed Vireo, Ovenbird, Summer Tanager, Rufous-sided Towhee.

146. DECIDUOUS FLOODPLAIN FOREST. — **Location:** Oklahoma; Delaware Co., 4 mi S of Jay; 36°21'N, 94°48'W, Lake Eucha E Quadrangle, USGS. **Continuity:** Established 1979; 3 consecutive years. **Size:** 6.7 ha = 16.6 acres. **Description of Plot:** See AB 34: 53, (1980). **Weather:** Rainfall and tempera-

tures fell within the normal range in sharp contrast to the drought and excessive temperatures during the spring and summer of 1980. However, ground water has not been completely restored. Brush Creek ran in late May and again in late June and early July. At other times only a few pools were found. The shortage of water must have reduced the food supply for some birds. **Coverage:** May 6, 11-12, 26; June 3, 7, 21; July 3, 10, 31; 0430-0930 and 1620-2050. Total man-hours: 27. **Census:** Acadian Flycatcher, 7 (104, 42); Cardinal, 7; N. Parula, 6 (89, 36); Indigo Bunting, 6; Yellow-billed Cuckoo, 5 (74, 30); Carolina Chickadee, 5; Tufted Titmouse, 5; Kentucky Warbler, 5; Blue-gray Gnatcatcher, 4 (60, 24); Louisiana Waterthrush, 4; Carolina Wren, 3.5 (52, 21); Red-bellied Woodpecker, 3 (45, 18); Great Crested Flycatcher, 3; Prothonotary Warbler, 3; Brown-headed Cowbird, 3; Ruby-throated Hummingbird, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; White-eyed Vireo, 2; Red-eyed Vireo, 2; Black-and-white Warbler, 2; Blue Jay, 1; Summer Tanager, 1; Am. Goldfinch, 1. **Total:** 24 species; 84.5 territorial males (1258/km², 509/100 acres). **Visitors:** Turkey Vulture, Red-shouldered Hawk, Barred Owl, Pileated Woodpecker, Hairy Woodpecker, E. Phoebe, Com. Crow. **Remarks:** The clearing of approximately 0.6 ha (1.5 acres) last winter increased both the area of openings and the amount of edge. The Carolina Wren continues to increase and its population is probably back to normal.—

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147. GAMBEL'S OAK-MOUNTAIN MAHOGANY WOODLAND. — **Location:** Colorado; El Paso Co., T14S, R67W, SE corner of Sec. 16 and NE corner of Sec. 21, off the Gold Camp Road; 38°49'N, 104°53'W, Manitou Springs Quadrangle, USGS. **Continuity:** Established 1979; 3 consecutive years. **Size:** 18.4 ha = 45.5 acres. **Description of Plot:** See AB 34: 119 (1979). **Weather:** Much rainfall. Temperature range 75-90°F. **Coverage:** May 24; June 4-6, 21, 28; July 5, 18, 25-26; Aug. 8-9, 23, 30; 0700-0900 or 1700-2000. Total man-hours: 30. **Census:** Rufous-sided Towhee, 14 (76, 31); Broad-tailed Hummingbird, 4 (22, 9); Am. Robin, 2; Scrub Jay, 2; Brown-headed Cowbird, 1; Willow and Alder Flycatcher, 1; W. Tanager, 1; Steller's Jay, +; Com. Flicker, +. **Total:** 9 species; 25 territorial males (136/km², 55/100 acres). **Visitors:** Mourning Dove, Black-billed Magpie, Com. Crow, Black-capped Chickadee, White-breasted Nuthatch, Gray Catbird, Evening Grosbeak, Pine Siskin.—SHERRENE D. ST. HELENS, 306 W. Boulder, Colorado Springs, CO 80905.

148. SCRUB OAK-MOUNTAIN MAHOGANY WOODLAND. — **Location:** Colorado; El Paso Co., 100 m W Dwire Hall, Univ. of Colo. campus, Colorado Springs; 38°52'N, 104°47'W, Pikeview Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 8 ha = 19.77 acres. **Description of Plot:** See AB 35: 87 (1981). **Elevation:** 6400-6500 ft. **Wea-**

ther: Normal spring and more than usual amount of rain through the summer. **Coverage:** May 31; June 5, 14, 26, 28; July 3, 5, 12, 15, 26; Aug. 2, 23; 0700-0830. Total man-hours: 21. **Census:** Rufous-sided Towhee, 9 (112, 46); Mourning Dove, 2; Black-billed Magpie, 2; Scrub Jay, 1.5; Virginia's Warbler, 1; Brown-headed Cowbird, 1; Green-tailed Towhee, 1; Am. Robin, 0.5; W Meadowlark, 0.5; Com. Flicker, +; Com. Crow, +; White-breasted Nuthatch, +; Brewer's Blackbird, +. **Total:** 13 species, 18.5 territorial males (231/km², 94/100 acres). **Visitors:** Red-tailed Hawk, Rock Dove, Com. Nighthawk, White-throated Swift, Broad-tailed Hummingbird, Violet-green Swallow, Starling, House Sparrow, Black-headed Grosbeak, House Finch, Am. Goldfinch, Lark Bunting. **Remarks:** Nest found: Mourning Dove. The Am. Robin was far less abundant as a breeding species compared to last year (and most years) both on the plot and in the general area of north Colorado Springs, yet during very late August and through September large numbers were seen. Two breeding species that were not recorded at all last year were Virginia's Warbler and Green-tailed Towhee, both of which seemed definitely to prefer the two dominant shrubs, Mountain Mahogany and Scrub Oak.—DON VAN HORN, Dept. Biology, Univ. of Colorado, Colorado Springs, CO 80907.

149. MAPLE-BOX-ELDER CREEKBOTTOM. — **Location:** Utah; Salt Lake Co., 2.5 mi NE of Fort Douglas, Salt Lake City, 40°48'N, 111°47'W, Fort Douglas Quadrangle, USGS. **Continuity:** New. **Size:** 11.09 ha = 27.4 acres (irregular, following Parley's Fork and Red Butte Creeks, measured from aerial photographs and ground survey). **Description of Plot:** Creek bottoms dominated by Bigtooth Maple (*Acer grandidentatum*), Box-elder (*Acer negundo*) and Water Birch (*Betula occidentalis*). Prominent shrubs are Choke Cherry (*Prunus virginiana*) and Red-osier Dogwood (*Cornus stolonifera*). Ground cover is grasses and creepers. A quantitative survey of the vegetation gave the following results: Trees, 3-in. diameter and over, based on 6 tenth-acre circular samples, 644/acre, total basal area 59.4 ft²/acre. Species comprising over 90% of the total number of trees Bigtooth Maple, 288, 45, 48, 60; Water Birch, 154, 24, 21, 80; Box-elder, 124, 19, 19, 80, Gambel's Oak (*Quercus gambelii*), 76, 12, 10, 40; White Fir (*Abies concolor*), 2, 0, 1, 20. Trees by diameter class: A (3-6 in.) 452, 70, 22.6, 38; B (6-9 in.) 160, 25, 24.0, 40; C (9-15 in.) 32, 5, 12.8, 22. Shrub stems/acre 23,083, ground cover 82%; canopy cover 50%; average canopy height 20.5 ft (range 0-28 ft). **Edge:** Bordered partially on the SE, SW and N by similar woodland and on the remainder by mountain shrub hillside, almost entirely Gambel's Oak. **Topography:** Two steep-sided canyons, each containing a permanent creek, join on the site; upstream both canyons close, downstream the main canyon opens up to the W. **Elevation:** 5600-6100 ft. **Weather:** June extremely wet, other dates warm and clear. **Coverage:** Mar. 25; Apr. 8, 14, 25; May 1, 9, 23; June 1, 8, 18, 27; July 13, between dawn and 0910-1230 hrs. Total man-hours: 95. **Census:** Warbling Vireo, 30 (271,

109), MacGillivray's Warbler, 8 (72, 29), Am Robin, 7 (63, 26); Swainson's Thrush, 7; Broad-tailed Hummingbird, 6 (54, 22); Yellow Warbler, 5 (45, 18); Song Sparrow, 5; Black-capped Chickadee, 4 (36, 15); Lazuli Bunting, 3 (27, 11); Downy Woodpecker, 2; House Wren, 2; Com. Flicker, 1; Dusky Flycatcher, 1; Brown-headed Cowbird, 1 (female); Black-headed Grosbeak, 1. **Total:** 15 species; 83 territorial males or females ($749/\text{km}^2$, 303/100 acres). **Visitors:** Cooper's Hawk, Mourning Dove, Orange-crowned Warbler, W. Tanager, Rufous-sided Towhee, Chipping Sparrow. **Remarks:** Nests located: Downy Woodpecker, 2; Black-capped Chickadee, 1; House Wren, 1; Am. Robin, 3; Swainson's Thrush, 2; Warbling Vireo, 8; Yellow Warbler, 2. The Am. Kestrel, Hairy Woodpecker, and W. Flycatcher were present in a study of portions of the plot in 1971-1972. The portion of Red Butte Canyon included in the plot is part of a Research Natural Area of the Wasatch Nat'l Forest and, hence, receives little intrusion. Our thanks to the Wasatch Nat'l Forest and to Ranger Jim Cook for providing us with access to the area. Further thanks to Lois Arn now of the Univ. of Utah Herbarium who assisted in identifying vegetation.—*JOSHUA A. BURNS, VAUGHN LOVEJOY and MARK LEPPERT, Utah Audubon Society, P.O. Box 9419, Salt Lake City, UT 84109.*

150. COAST LIVE OAK RIPARIAN WOODLAND. — **Location:** California, Orange Co., Starr Ranch Audubon Sanctuary, in Crow Canyon, 5.5 mi SE of Trabuco Oaks P.O. 33°35'30"N, 117°33'W, Canada Gobernadora Quadrangle, USGS. **Continuity:** New. **Size:** 6.9 = 17 acres (irregular 100×687 m; measured with tape and compass). **Description of Plot:** Part of a narrow continuous riparian woodland growing along a stream in the bottom of Crow Canyon. A N-S dirt road runs along the E-facing edge. Dominant canopy trees are California Live Oak (*Quercus agrifolia*) and California Sycamore (*Platanus racemosa*). Dominant shrubs are Mulefat (*Baccharis* sp.), White Sage (*Salvia mellifera*), Chaparral Currant (*Ribes malvaceum*), Laurel Sumac (*Rhus laurina*) and Coastal Sage (*Artemisia tridentata*). A quantitative survey of the vegetation gave the following results: Trees, 3-in. diameter and over, based on five 0.1 acre circular samples, 44/acre; total basal area 55.4 ft^2/acre . Species comprising 100% of the total number of trees: California Live Oak 26, 64, 69, 100; California Sycamore 16, 36, 31, 80. Trees by diameter class size: A (3-6 in.) 2, 9, 0.2, 1; B (6-9 in.) 4, 18, 1.2, 4; C (9-15 in.) 16, 73, 12.8, 46; D (15-21 in.) 14, 64, 25.291; E (21-27 in.) 6, 27, 6.2, 22; F (27-33 in.) 2, 9, 9.8, 35. Shrub stems/acre, 3400; ground cover 39%; canopy cover 61%; average canopy height 53 ft (range 45-64). **Edge:** Continuous riparian woodland borders N and S. Coastal Sage community on adjacent slopes. **Weather:** Cool, partly cloudy; no precipitation with few sunny days. **Coverage:** Apr. 16-17, 25-26; May 8-9, 16-17, 23-24; 0545-1030 hrs. Total man-hours: 36. **Census:** House Wren, 11 (160, 65); Rufous-sided Towhee, 7 (102, 41); Plain Titmouse, 4.5 (65, 26); Bushtit, 4.5; Starling, 4 (58, 24); Lesser Goldfinch, 4;

Mourning Dove, 3.5 (51, 21), Bewick's Wren, 3.5; Brown Towhee, 3.5; Black-chinned Hummingbird, 3 (44, 18); Ash-throated Flycatcher, 2;utton's Vireo, 2; Brown-headed Cowbird, 2; Scrub Jay, 1.5; Wrentit, 1.5; Costa's Hummingbird, 1; Com. Flicker, 1; Nuttall's Woodpecker, 1; Cactus Wren, 1; Cooper's Hawk, 0.5; Orange-crowned Warbler, 0.5; House Finch, 0.5; Red-tailed Hawk, +; Red-shouldered Hawk, +; Screech Owl, +; California Thrasher, +. **Total:** 26 species; 63 territorial males or females ($915/\text{km}^2$, 371/100 acres). **Visitors:** Turkey Vulture, Am. Kestrel, Band-tailed Pigeon, W. Wood Pewee, W. Flycatcher, Com. Crow, Ruby-crowned Kinglet, Warbling Vireo, Wilson's Warbler, Hooded Oriole, W. Tanager, Black-headed Grosbeak, Lazuli Bunting, Lawrence's Goldfinch. **Remarks:** This plot adjoins to the E an earlier plot (Bontrager, AB 28: 1035-1036, 1974). 37% of the plot was burned six months prior to this survey. Nests found: 20. Special thanks to Mike McCrary and Bev McIntosh for their help with the vegetation survey.—*JULIA NAGATA, 1419 W. 172nd Street, Gardena, CA 90247.*

151. CREEKSIDER WILLOW WOODLAND. — **Location:** California; Orange Co., Aliso Creek along the NE flank of Sheep Hills, from the N edge of a short section of concrete and riprap near the junction of Aliso Creek Rd and Alicia Pkwy, N; located 7.5 km (4.5 mi) from creek mouth at the Pacific Ocean; 33°33'45"N, 117°43'W, San Juan Capistrano Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (sinuous belt, approximately 725 m long, 40-100 m wide; planimetric measurements for area from 1:10,500 scale aerial photo). **Description of Plot:** A narrow belt of willow (*Salix* spp.) woodland and associated habitats oriented roughly N-S. Flowing water was present in the creek during the entire study period. The plot included approximately 12.4% water course, 81.6% adjacent bottomlands, and 6% steep eroded bank or low bordering slope (all quantified data based upon seven 2 m wide belt transects run perpendicularly across creek at 100 m intervals along plot; total of 872 m^2 of transect). Plant cover was sparse within the water course and included widely spaced small clumps of Water-cress (*Rorippa nasturtium-aquaticum*), Redtop (*Agrostis stolonifera*), *Paspalum dilatatum*, and Sprangletop (*Leptochloa uninervia*). The bottomlands are described below by zones that were generally indicated by dominant plant cover type. These zones and the percent of each comprising the bottomlands were reed 9.1%, barren sand flat 5.1%, herbaceous 14.7%, shrub/subshrub 18.7%, and willow woodland 52.4%. The reed zone spanned the interface of the water course and the dry ground surface of the bottomlands. The reed belt was narrow, ranging 2.5-7.0 m in width ($n = 7$, $\bar{x} = 4.7$ m), highly discontinuous along the creek (present in 6 of 7 transects), and usually developed along only one side of the creek. Total plant cover was estimated at 76% and was contributed by 10 species including *Scirpus olneyi* 39.3%, *Typha domingensis* 25.4%, *T. latifolia* 8.1%, willow sprouts 1.5%, *Heleocharis parishii* 0.8%, *Sonchus oleraceus* 0.4%, and *Xanthium strumarium* 0.3%. About half of the reed

cover was contributed by dead and matted stems. In the herbaceous zone, plant growth was low and open. The cover varied 15-53% ($\bar{x} = 35.6\%$) and was contributed by 29 species. Plant cover in the shrub/subshrub zone was estimated at 80.7% and was contributed largely by 16 species including *Baccharis glutinosa* 38.1%, *Melilotus albus* 23.2%, *Urtica holosericea* 3.7%, *Salix laevigata* 3.7%, *Brassica nigra* 3.5%, *Nicotiana glauca* 1.8%, and *Salix gooddingii* 1.5%. Approximately 43% of the willow woodland sampled had attained a height just greater than 6 m; the remaining 57% varied from 2m to just less than 6 m. Canopy closure in the woodland ranged 70-95%. Plant cover in the upper story was just greater than 100% and was contributed by *S. lasiolepis* 48.6% (the proportions of the 3 species of willow are approximate), *S. laevigata* 39.4%, *B. glutinosa* 5.4%, *S. gooddingii* 4.4%, and *Arundo donax* 3.2%. There was an average of 259 willow stems/ 100m^2 and 28 *Baccharis* stems/ 100m^2 . The woodland understory was very sparse. Total cover contributed by the 19 species observed was only 7.3%. The major understory cover contributors were *Melilotus albus* 3.3%, *Artemisia douglasii* 1.0%, *Baccharis* sprouts 0.6%, *Apium graveolens* 0.5%, and willow sprouts 0.4%. The litter layer was very thin, was comprised only of leaves, and provided an average ground cover of 77%. Only one deadfall was encountered along the transects. The bordering banks comprised a narrow transitional area between the riparian and adjacent upland habitats. Plant cover on the slopes averaged 92.6% and was largely contributed by 12 species including *Haplopappus venetus* 39%, *S. lasiolepis* 18.7%, *M. albus* 11.3%, and *Distichlis spicata* 10.1%. **Edge:** The S half of the E boundary is bordered by a paved road and the grounds of the federal building. The N half borders a grassy field and low hill with abundant plants including *Bromus mollis*, *B. diandrus*, *Brassica* spp., *Chenopodium* spp. and a few widely spaced *B. glutinosa*. The W boundary borders a field of Common Barley (*Hordeum vulgare*) which is planted, harvested, and then grazed by cattle. The creekside habitat continues to the N and in patches for a short distance to the S. **Topography:** The plot slopes gradually from 180 ft (55 m) on the N to 155 ft (47 m) on the S. **Weather:** The sky was overcast on 3 visits, otherwise clear and sunny. Temperatures (estimated) varied from 46°F in the early morning to 85° by late morning. **Coverage:** Apr. 3, 11, 21; May 6, 9, 22, 29, 30; 0600-0945 hours. Total man-hours: 24. **Census:** Song Sparrow, 26 (428, 173); Com. Yellowthroat, 13 (214, 87); Am. Goldfinch, 12 (198, 80); Bushtit, 6 (99, 40); Brown-headed Cowbird, 6 (females); Black-headed Grosbeak, 6; Mourning Dove, 5 (82, 33); Costa's Hummingbird, 5; Brown Towhee, 4 (66, 27); Anna's Hummingbird, 3 (49, 20); N. Oriole, 3; Red-winged Blackbird, 2; Blue Grosbeak, 1.5; Cooper's Hawk, 1; W. Wood Pewee, 1; California Thrasher, 1; Yellow-breasted Chat, 1; W. Meadowlark, 1; House Finch, 1; Lesser Goldfinch, 1; California Quail, +; W. Kingbird, +; Black Phoebe, +. **Total:** 23 species; 99.5 territorial males or females ($1639/\text{km}^2$, 663/100 acres). **Visitors:** an additional 45 species. **Remarks:** Nests found Am. Goldfinch, 5; Mourning Dove, 4; Bush-

tit, 3, Anna's Hummingbird, 2, Costa's Hummingbird, 1; Com. Yellowthroat, 1; Brown Towhee, 1; Song Sparrow, 1. Abundant signs of predatory mammals were observed on the plot indicating the presence of coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and opossum (*Didelphis marsupialis*). A large flock of Red-winged Blackbirds (50+) nested on the adjacent hillside. We thank Sharon Lockhart for assistance with the vegetation analysis; Dave McGillivray for help; and personnel of the Aliso Viejo Company, particularly Ron Bora and Dan Kelley, for granting access to the creek and arranging for the use of aerial photos.—**RICHARD ZEMBAL, GARY P. WHEELER, and DALE A. PIERCE, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.**

152. Sycamore—Coast Live Oak Riparian Woodland. —**Location:** California, Orange Co., on the Ronald W. Caspers Regional Park in Bell Canyon, 6.1 mi from Trabuco Oaks Post Office; 33°35'N, 117°34'W, Canada Gobernadora Quadrangle, USGS. **Continuity:** Established 1977; 2 intermittent years. **Size:** 7.2 ha = 17.8 acres. **Description of Plot:** See AB 32: 84-85 (1978). **Weather:** Moderate temperatures with early morning and late afternoon low clouds and fog throughout census period. **Coverage:** Apr. 23-29; May 5, 17, 24; from dawn-1130 and 1600-1800. Total man-hours: 67. **Census:** California Quail, 10 (139, 56); House Wren, 10; Rufous-sided Towhee, 6 (83, 34); Starling, 5 (69, 28); Ash-throated Flycatcher, 4 (56, 22); Brown Towhee, 4; Scrub Jay, 3 (42, 17); Cactus Wren, 3; Com. Flicker, 2; W. Kingbird, 1; Wrentit, 1; Lesser Goldfinch, 1. Unconfirmed breeders: Killdeer, Mourning Dove, Poor-will, Nuttall's Woodpecker, Acorn Woodpecker. **Visitors:** Black-chinned Hummingbird, Plain Titmouse, Bushtit, Hooded Oriole, House Finch. **Total:** 17 species; 50 territorial males or females (694/100 ha, 281/100 acres). **Remarks:** Heavy rains in 1978-79 caused severe erosion to the stream removing available habitat. A large brush fire in 1980 occurred in the Starr Ranch Audubon Sanctuary N of the plot. Special thanks to David Bontrager.—**PATRICIA A. FLANAGAN and KENT C. ARMSTRONG, Dept. of Biol., Calif. State Univ., Long Beach, CA 90840.**

153. Willow-Riparian. —**Location:** California; Los Angeles Co., Rolling Hills. Bordered by Palos Verdes Dr. E, Palos Verdes Dr. N, Montecillo Dr., and a golf course. **Continuity:** New. **Size:** 3.08 ha = 7.61 acres. **Description of Plot:** Dense willow and shrub vegetation in small canyon between field of wild oats and golf course. Approximately 20% of plot was under 6-10 in of water at start of coverage, decreasing to 5%. Dominant trees are Elder (*Sambucus caerulea*), Red Willow (*Salix laevigata*), and Black Willow (*S. gooddingii variabilis*). The shrubs included Wild Radish (*Raphanus sativa*), Curly Dock (*Rumex crispus*), Tomato (*Lycopersicon esculentum*), Cocklebur (*Xanthium strumarium*), Ox Tongue (*Picris echioides*), Mule Fat (*Baccharis glutinosa*),

(*B. douglasii*), Wild Oat (*Avena fatua*), Sow-Thistle (*Sonchus asper*), Field Mustard (*Brassica rapa*), and herbs of the Asteraceae family. The trees ranged in height from 6-30 ft, surrounded by small clearings and dense thickets. **Weather:** Temperatures 50-90°F. No precipitation was recorded during the census period. **Coverage:** Apr. 5, 8, 15, 22, 29; May 4, 6, 10, 13, 18; 0600-1000. Total, 15 hours. **Census:** Mourning Dove, 15 (487, 197); House Finch, 9 (292, 118); Song Sparrow, 9; Bushtit, 8 (260, 105); Brewer's Blackbird, 8; House Sparrow, 6 (195, 79); Am. Robin, 4 (130, 53); Anna's Hummingbird, 3 (97, 39); Mockingbird, 3; N. Oriole, 3; Rufous-sided Towhee, 2; Loggerhead Shrike, 1; Am. Kestrel, +; Rock Dove, +; W. Meadowlark, +. **Total:** 15 species; 71 territorial males (2305/km²; 933/100 acres). **Remarks:** Owing to the dense vegetation, it was difficult to observe the hatching and fledging, although numerous nests could be seen in the willows.—**DIANE VAN DE WATER, 6421 Via Canada, Rancho Palos Verdes, CA 90274.**

154. Burned Pine-Fir Forest. —**Location:** California; Nevada Co., Sagehen Creek Field Station, 6 km NW of Hobart Mills; 39°26'N, 120°14'W, Truckee Quadrangle, USGS. **Continuity:** New. (first time in AB, 9 times intermittently since 1966; see references in *Mature Pine-Fir Forest*, Census No. 151). **Size:** 8.4 ha = 20.9 acres (213 × 396 m, measured with transit and tape). **Description of Plot:** Burned by a severe crown fire in 1960; all overstory trees were killed except a narrow band of mature trees along one end of the plot. The vegetation is dominated by dense brush, primarily Tobacco Brush (*Ceanothus velutinus*), Squaw Carpet (*C. prostratus*), Greenleaf Manzanita (*Arctostaphylos patula*), currant (*Ribes sp.*), and by natural regeneration of Jeffery Pine (*Pinus jeffreyi*), and Lodgepole Pine (*P. murrayana*). Standing dead trees are numerous, but currently represent only 11% of the number standing in 1960. A quantitative survey of the vegetation gave: Live trees 7.6 cm (3 in.) diameter and over, based on point-quarter analysis of 192 trees, 123 per ha (50 per acre); total basal area 5.9 m² per ha (25.6 ft² per acre). Dead trees, based on total count, 28 per ha (11 per acre); total basal area 1.5 m² per ha (6.5 ft² per acre). Species comprising 90% of the total number of live trees (figures after each are number of trees per ha (number per acre), relative density (%), relative dominance (%), frequency (%), in that order): Jeffery Pine 90 (36), 73, 35, 98; Lodgepole Pine 21 (9), 17, 1, 33. Live trees by diameter class (figures after each are number of trees per ha (number per acre), relative density (%), basal area in m² per ha (ft² per acre), relative dominance (%)): A (3-6 in.) 101 (41), 82, 1.0 (4.4), 18; B (6-9 in.) 1, (0.5), 0.3 (1.3), 1; C (9-15 in.) 6 (2), 5, 0.4 (1.7), 8; D (15-21 in.) 10 (4), 8, 1.6 (7.0), 28; E (21-27 in.) 5 (2), 4, 1.3 (5.7), 23; F (27-33 in.) 1 (0.4), 1, 0.6 (2.6), 11; G (33-47 in.) 1 (0.4), 0.5, 0.7 (2.9), 12. Shrub cover 43%; ground cover 85%, canopy cover 7%; average canopy height 4.2 m (range 0-10 m). **Edge:** Bordered on 1 side by burned forest with standing snags, on 2 sides by burned forest on which all snags were cut, and on 1 side by unburned pine-fir forest. **Topography:** Essentially flat on broad

ridgeline. **Elevation:** 1950 m (6400 ft) **Weather:** The winter was milder and drier than the norm, followed by an early spring. **Coverage:** May 25, 29, 31; June 3, 5, 10, 14-17; 0400-0800, PST. Total man-hours: 27. **Census:** Fox Sparrow, 4 (47, 19); Mountain Chickadee, 3 (36, 14); *Empidonax* sp., 2; Dark-eyed Junco, 2; Mountain Bluebird, 1; Yellow Warbler, 1; Brown-headed Cowbird, 1; Cassin's Finch, 1; Pine Siskin, 1; Green-tailed Towhee, 1; Chipping Sparrow, 1; Com. Nighthawk, +; Calliope Hummingbird, +; Williamson's Sapsucker, +; Hairy Woodpecker, +; W. Wood Pewee, +; Pygmy Nuthatch, +; Ruby-crowned Kinglet, +. **Total:** 18 species, 18 territorial males and females (213/km², 86/100 acres). **Visitors:** Mourning Dove, Com. Flicker, White-headed Woodpecker, Steller's Jay, White-breasted Nuthatch, Brown Creeper, Townsend's Solitaire, Solitary Vireo, Nashville Warbler, Yellow-rumped Warbler, W. Tanager, Pine Grosbeak. **Remarks:** Nests found (10): Hairy Woodpecker, 1; Olive-sided Flycatcher, 1; Mountain Chickadee, 3; Mountain Bluebird, 1; Yellow Warbler, 1; Dark-eyed Junco, 2, Chipping Sparrow, 1. We thank M.P. Yoder-Williams, C. Kellner, and D. Hall for assistance in censusing.—**ROGER D. HARRIS and MARTIN G. RAPHAEL, Sagehen Creek Field Station, Dept. of Forestry and Resource Management, Univ. of Calif., Berkeley, CA, 94720.**

155. Mature Pine-Fir Forest. —**Location:** California; Nevada Co., Sagehen Creek Field Station, 6.5 km NW of Hobart Mills; 39°26'N, 120°14'W, Truckee Quadrangle, USGS. **Continuity:** New (first time in AB, 9 times intermittently since 1966; 1966-68 censuses in Bock and Lynch (1970), *Condor* 72: 182-189; 1975 census in Bock et al (1978), *Wilson Bull.* 90: 119-123; 1977 census in Raphael (1980) PhD Diss., Univ. Calif Berk.). **Size:** 8.4 ha = 20.9 acres (213 × 396 m, measured with transit and tape). **Description of Plot:** An old-growth coniferous forest undisturbed since removal of a few larger trees in 1930s. Dominant overstory trees include White Fir (*Abies concolor*), Jeffrey Pine (*Pinus jeffreyi*), Lodgepole Pine (*P. contorta*), Sugar Pine (*P. lambertiana*), and Red Fir (*A. magnifica*). Understory shrubs are sparse; species include Squaw Carpet (*Ceanothus prostratus*), Tobacco Brush (*C. velutinus*), Chinquapin (*Castanopsis sempervirens*), and Snowberry (*Symporicarpos sp.*). A quantitative survey of the vegetation gave: Live trees 7.6 cm (3 in.) diameter and over, based on point-quarter analysis of 192 trees, 805 per ha (326 per acre); total basal area 41.3 m² per ha (180 ft² per acre). Dead trees, based on a total count, 33 per ha (13 per acre); basal area 5.2 m² per ha (22.5 ft² per acre). Species comprising 90% of the total number of live trees (figures after each are number of trees per ha (number per acre), relative density (%), relative dominance (%), frequency (%), in that order): White Fir 415 (168), 52, 34, 85; Jeffrey Pine 336 (136), 42, 61, 77. Trees by diameter class (figures after each are number of trees per ha (number per acre), relative density (%), basal area in m² per ha (ft² per acre), relative dominance (%)): A (3-6 in.) 443 (179), 55, 4.5 (19.6), 11; B (6-9 in.) 121 (49), 15, 3.4 (14.8), 8; C (9-15 in.) 137

(55), 17, 10 0 (43 6), 24, D (15-21 in.) 64 (26), 8, 10.5 (45.8), 25; E (21-27 in.) 32 (13), 4, 9.3 (40.5), 23; F (27-33 in.) 8 (3), 1, 3.6 (15.7), 9. Shrub cover 17%; ground cover 4%; canopy cover 75%; average canopy height 71.3 ft (range 56-95 ft). **Edge:** Bordered on all sides by similar forest. **Topography:** Essentially flat on a broad ridgeline. **Elevation:** 6400 ft. **Weather:** The winter was milder and drier than the norm, followed by an early spring. **Coverage:** May 26-27, 29, 31; June 3, 5, 10, 14-17; 0400-0850 hours, PST. Total man-hours: 28. **Census:** *Empidonax* sp., 3 (35, 14); Yellow-rumped Warbler, 2; Red-breasted Nuthatch, 1.5; Brown Creeper, 1.5; Townsend's Solitaire, 1.5; Golden-crowned Kinglet, 1.5; W. Tanager, 1.5; Dark-eyed Junco, 1.5; Am. Robin, 1; Hermit Thrush, 1; Cassin's Finch, 1; Williamson's Sapsucker, 0.5; Steller's Jay, 0.5; Black-backed Three-toed Woodpecker, +; Pine Siskin, +. **Total:** 15 species; 18 territorial males (213/km², 86/100 acres). **Visitors:** Mountain Quail, Caliope Hummingbird, White-headed Woodpecker, Hairy Woodpecker, Ruby-crowned Kinglet, Solitary Vireo, Yellow Warbler, MacGillivray's Warbler, Brown-headed Cowbird, Evening Grosbeak, Red Crossbill. **Remarks:** Nests found (4): Red-breasted Nuthatch, 1; Yellow-rumped Warbler, 1; Mountain Chickadee, 2. We thank M.P. Yoder-Williams, C. Kellner, and D. Hall for assistance in censusing.—*ROGER D. HARRIS and MARTIN G. RAPHAEL, Sagehen Creek Field Station, Dept. of Forestry and Resource Management, Univ. of Calif., Berkeley, CA 94720.*

156. PONDEROSA PINE-SCRUB OAK FOREST. — **Location:** Colorado; El Paso Co., U.S. Air Force Academy; 500 m W of jct of Monument Creek and W Monument, 38°57'N, 104°50'W, Pikeview Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 12 ha = 29.65 acres. **Description of Plot:** See AB 35: 88 (1981). **Weather:** Last official snowfall was May 18. Temperature: 30-92°F. Hail was recorded twice in May and once in July. The period was wetter and cooler than average with 28 days experiencing thunderstorms. **Coverage:** June 9, 18, 23, 27; July 2, 4, 7, 17, 27; Aug. 1; 0530-0730. Total man-hours: 20. **Census:** W. Wood Pewee, 6 (50, 20); Chipping Sparrow, 4 (33, 13); Rufous-sided Towhee, 3.5 (29, 12); Com. Nighthawk, 3 (25, 10); Am. Robin, 2; Solitary Vireo, 2; Mourning Dove, 1; Broad-tailed Hummingbird, 1; Hairy Woodpecker, 1; Mountain Chickadee, 1; Pygmy Nuthatch, 1; Red Crossbill, 1; Great Horned Owl, 0.5. **Total:** 13 species; 27 territorial males (225/km², 91/100 acres). **Visitors:** Com. Flicker, Violet-green Swallow, Steller's Jay, Black-capped Chickadee, Townsend's Solitaire, Yellow-breasted Chat, Brown-headed Cowbird, Lazuli Bunting, House Finch, Pine Siskin, Am. Goldfinch, Lesser Goldfinch, Dark-eyed Junco, Gray-headed Junco. **Remarks:** Nests found: Com. Nighthawk, 3. Thanks to Joseph E. Toole and Russell DeFusco for assistance.—*JOHN W. OBRINGER and CHARLES A. CHASE III, Denver Museum of Natural History, Denver, CO 80205.*

157. PONDEROSA PINE-SCRUB OAK-MT. 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 1967; 15 consecutive years. **Size:** 8.09 ha = 20 acres. **Weather:** A very hot summer again, above normal, with 39 days over 90°F (normal is 31 days). **Coverage:** 9 trips in June, July and August; hours 0800-2000 hours. Total man-hours: 55. **Census:** W. Bluebird, 15 (185, 75); Broad-tailed Hummingbird, 3 (37, 15); White-breasted Nuthatch, 3; House Finch, 2; Lesser Goldfinch, 2; Chipping Sparrow, 2; Hairy Woodpecker, 1; Black-headed Grosbeak, 1; Red Crossbill, 1; Rufous-sided Towhee, 1; Gray-headed Junco, 1. **Total:** 11 species; 32 territorial males (395/km², 160/100 acres). **Visitors:** Turkey Vulture, Cooper's Hawk, Band-tailed Pigeon, Mourning Dove, Rufous Hummingbird, Com. Flicker, W. Wood Pewee, Steller's Jay, Black-billed Magpie, Com. Crow, Black-capped Chickadee, Mountain Chickadee, Pygmy Nuthatch, Am. Robin, Solitary Vireo, Virginia's Warbler, Brown-headed Cowbird, W. Tanager, Lark Sparrow, Brewer's Sparrow. **Remarks:** 15 W. Bluebirds in 15 boxes; 3 White-breasted Nuthatches in 3 boxes.—*MILDRED O. SNYDER, 161 Del Mar Circle, Aurora, CO 80011.*

158. 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 Stewart Forest Service Camp upstream to N boundary of Sunny Flat Camp; 31°54'N, 109°10'W, Portal Quadrangle, USGS. **Continuity:** Established 1978; 3 intermittent years. **Size:** 9.11 ha = 22.5 acres. **Description of Plot:** See AB 33: 84-5 (1979). **Weather:** Dry in May, June; rains on July 2 and 9. Temperatures were over 90°F on 11 trips. **Coverage:** (1980) May 22-23, 27, 30; June 2, 4-5, 7-8, 11-12, 17-18, 23-24, 30; July 1, 9-10, 1980; 0530-1200 and 1615-1730, MST. Total man-hours: 54. **Census:** W. Wood Pewee, 21 (231, 93); Black-chinned Hummingbird, 19 (209, 84); Black-throated Gray Warbler, 10 (110, 44); Rufous-sided Towhee, 10; Wied's Crested Flycatcher, 8.5 (93, 38); White-breasted Nuthatch, 8 (88, 36), Olivaceous Flycatcher, 7.5 (82, 33); Acorn Woodpecker, 7 (77, 31); Bewick's Wren, 7, Solitary Vireo, 7; Lucy's Warbler, 6 (66, 27), Arizona Woodpecker, 4 (44, 18); Bridled Titmouse, 4; Hutton's Vireo, 4; Warbling Vireo, 4; Am. Robin, 3 (33, 13); Painted Redstart, 3; Black-headed Grosbeak, 3, Cassin's Kingbird, 2.5; Rivoli's Hummingbird, 2; Blue-throated Hummingbird, 2; Mexican Jay, 2; Sulphur-bellied Flycatcher, 1.5, Cooper's Hawk, 1; Coppery-tailed Trogon, 1; Com. Flicker, 1; Bushtit, 1; Cañon Wren, 1; Scott's Oriole, 1; W. Tanager, 1; Hepatic Tanager, 1; Black Phoebe, 0.5; Turkey, +, Mourning Dove, +; Virginia's Warbler, +, Mexican Junco, +. **Total:** 36 species, 154.5 territorial males or female hummingbirds (1697/km², 687/100 acres). **Visitors:** Band-tailed Pigeon, White-throated Swift, Violet-green Swallow, Com. Raven, Rufous-crowned Sparrow. **Remarks:** No estimate was attempted of the non-territorial Brown-headed Cowbirds. 35 nests were located of which 19 were Black-chinned Hummingbirds with a large number clustered near the nesting Cooper's Hawk, not an unusual occurrence in SE Arizona. There were 2 pairs of Coppery-tailed Trogons, one at each end of the plot where the respective males were on territorial patrol and/or foraging.—*HARRIETTE W. BARKER (compiler), A.J. CLAY, CAROL deWAARD, RUTH R. OGDEN, ELSIE ROSE, STEPHEN M. RUSSELL, 5302 S. Missiondale Rd., Tucson, AZ 85706*

159. MOUNTAIN MEADOW AND OPEN CONIFEROUS FOREST. — **Location:** Colorado, Boulder Co., 7 mi SW of Boulder, access via County Rd 77 (Flagstaff-Gross Reservoir rd), near Kossler Lake; SW 1/4 of NE 1/4, Sec. 10, T1S, R71W; 39°58'12"N, 105°20'16"W, Eldorado Springs Quadrangle, USGS. **Continuity:** New. **Size:** About 13 ha = 32 acres. **Description of Plot:** 60% meadow with a few scattered trees; 40% open coniferous forest. Meadow has not been grazed for past 8 years. Forested portion can be split into 3 distinct areas, depending on the way in which the Ponderosa Pines infested with Mountain Pine Beetle were treated during the last 5 years: (1) infested trees cut with selected thinning and spraying of live trees, (2) all trees sprayed, no cutting, dead timber left standing or fallen, (3) no cutting or spraying, dead timber left standing or fallen. County Rd 77 borders S side of plot, W and N sides are open forest, center and E side are meadow. Narrow dirt access road runs through property. About half the area is fenced. Three summer homes, occupied intermittently, and 1 year-round house are located on edges of plot, with some outbuildings. More meadow has been created by thinning of timber and it comprises the larger part of the plot. The dominant canopy trees are Ponderosa Pine (*Pinus ponderosa*), comprising 50% of canopy, most averaging 10 in dbh, although some are 18-24 in. Douglas-fir (*Pseudotsuga menziesii*) comprise 30% of canopy, most 6-10 in. diameter. Many have been destroyed by spruce budworm or were thinned, especially on N edge of plot. Limber Pine (*P. flexilis*) comprise 20% of canopy, unusual at this altitude, 3-10 in dbh, was not affected by the beetle. Much of forest area has new growth emerging in all three species. Dominant shrubs are Buckbrush (*Ceanothus fendleri*), Com. Juniper (*Juniperus communis*), Kinnikinnick (*Arcostaphylos uva-ursi*), Oregon Grape (*Mahonia repens*), Sagebrush (*Artemesia frigida* and *A. ludoviciana*), and W. Choke Cherry (*Prunus virginiana*). Major grasses include Cheat Grass (*Bromus tectorum*) which is phasing out as pasture regenerates, Squirretail (*Sitanion hystrix*), Mountain Muhly (*Muhlenbergia montana*), Needle Grass (*Stipa* spp.), Timothy (*Phleum pratense*), Smooth Brome (*Bromopsis inermis pumpelliana*), and several species of Wheat Grass (*Agropyron* spp.). Meadows are a wild flower garden from May to September. **Edge:** Continuation of meadow on E, continuation of open forest on N and W, across County Rd 77 more meadow and Kossler Lake on S. Extreme N edge adjoins area which has not been cut or sprayed and there is a jumble of dead timber, some down, some standing, intermixed with live trees. This edge is very steep mountainside with little public access. **Topography:** Generally rather flat, rising to the ridge which runs to a point and drops steeply on 3 sides, forming a small divide and the beginning of several drainages. There is a small marshy area but no running streams. Springs are present in the meadow to the E outside of survey area. Granite, quartz and feldspar outcrops occur throughout the plot. **Elevation:** 7700 ft, except N portion which drops to 7600 ft at edge. **Weather:** During census period, temperatures 40-85°F. After a very dry winter with

little snow, the spring and summer months were unusually wet, producing luxuriant growth in the meadow. There was generally a breeze and afternoon showers were common. Normally the area is dry and typical of Colorado's arid climate in the foothills. **Coverage:** Apr. 17-18, 24; May 4, 10, 16, 25, 27, 30; June 6-7, 9, 13-14, 17, 20-21, 28; July 1-4, 13-15; 0630-1030 or 1600-2000. Total man-hours: 101. **Census:** Am. Robin, 6 (46, 19); Chipping Sparrow, 6; Yellow-rumped Warbler, 5 (39, 16); Gray-headed Junco, 5; Tree Swallow, 4 (31, 13); House Wren, 4; Pine Siskin, 4; Mountain Chickadee, 3 (23, 9); Mountain Bluebird, 3; Violet-green Swallow, 2; Vesper Sparrow, 2; Barn Swallow, 1; White-breasted Nuthatch, 1; Pygmy Nuthatch, 1; Townsend's Solitaire, 1; Brewer's Blackbird, 1; W. Tanager, 1; Lesser Goldfinch, 1; Blue Grouse, 0.5; Com. Flicker, 0.5; Hairy Woodpecker, 0.5; Virginia's Warbler, 0.5; Black-headed Grosbeak, 0.5; Red-breasted Nuthatch, +. **Total:** 24 species; 53.5 territorial males or females (413/km², 167/100 acres). **Visitors:** Turkey Vulture, Mourning Dove, Pygmy Owl, Com. Nighthawk, Broad-tailed Hummingbird, Rufous Hummingbird, Downy Woodpecker, Steller's Jay, Com. Raven, Com. Crow, Hermit Thrush, Ruby-crowned Kinglet, Warbling Vireo, W. Meadowlark, Red Crossbill. **Remarks:** Migration seemed slow in 1981 and territories were not generally established until mid-or late May; nesting is normally later at this elevation than on the plains. Special thanks to Mary Jane Schock for assistance.—HELEN J. STILES-WAINWRIGHT and ARTHUR WAINWRIGHT, 150 S. 36th Street, Boulder, CO 80303.

160. URBAN CAT-TAIL MARSH AND COTTONWOOD WOODLAND. — **Location:** Colorado; El Paso Co., T14S, R66W, SW of the center of Sec. 19 at the NW corner of the intersection of Fountain Creek and Tejon St.; 38°49'N, 104°49'W, Colorado Springs Quadrangle, USGS. **Continuity:** new. **Size:** 3.5 ha = 8.65 acres (rectangle 100 × 350 m, surveyed with chain along a naturally occurring trail). **Edge:** E and W sides of the grid are continuations of the woodland community. The S border lies adjacent to freeway entrance and exit ramps and urban development. Commercial buildings lie adjacent to the N border. **Topography:** A relatively level area with a raised walking path running along the N edge. **Elevation:** 5910 ft. **Weather:** May was cool with above normal precipitation for the month. Normal spring and summer weather, with intermittent afternoon showers. **Coverage:** May 16, 20, 23, 26, 28, 30; June 2, 4, 6, 9, 12, 16, 19, 23; July 2, 9, 28; Aug. 14; 0630-0800. Total man-hours: 27. **Census:** Red-winged Blackbird, 10 (286, 116); Song Sparrow, 10; Rock Dove, 4 (114, 46); Am. Robin, 2; Mallard, 1; Killdeer, 1; Spotted Sandpiper, 1; Black-billed Magpie, 1; W. Meadowlark, 1; Am. Goldfinch, 1; Mourning Dove, 0.5; Belted Kingfisher, 0.5; Cliff Swallow, +; Com. Crow, +; Com. Yellowthroat, +; Com. Grackle, +. **Total:** 16 species; 33 territorial males (943/km²; 382/100 acres). **Visitors:** Am. Kestrel, Broad-tailed Hummingbird, Com. Flicker, Hairy Woodpecker, Violet-green Swallow,

Black-capped Chickadee, Starling, House Sparrow, Brewer's Blackbird, Brown-headed Cowbird, N. Oriole, W. Tanager, House Finch, Green-tailed Towhee. **Remarks:** There seemed to be evidence of non-breeding males for both the Red-winged Blackbird and Am. Goldfinch. Special thanks to Donald Van Horn for his assistance with all phases of this report.—MARK JONES, 803 S. Cascade, Colorado Springs, CO 80903.

161. CAMPGROUND IN OLD ORCHARDS. — **Location:** Utah, Washington Co., Zion Nat'l Park, Watchman Campground, loops A, B & C; 37°12'N, 113°00'W, Zion Nat'l Park Topographic Map (Zion Canyon Section), USGS. **Size:** 10.1 ha = 25 acres. **Continuity:** New. **Description of Plot:** See AB 36 (1) 00, this issue. **Weather:** May rainfall above average, with temperatures below normal; June and early July hotter than average, with the only rain on June 29. **Coverage:** May 1, 3, 10, 15, 22, 31; June 7, 14, 21, 27; July 5, 11; 0550-0845, MDT. Total man-hours: 28.8. **Census:** Am. Robin, 11 (109, 44); House Sparrow, 9 (89, 36); Warbling Vireo, 8 (79, 32); Yellow Warbler, 8; N Oriole, 7 (69, 28); Black-headed Grosbeak, 5 (49, 20); Lesser Goldfinch, 4 (40, 16); Black-chinned Hummingbird, 3 (30, 12); Starling, 3; Brown-headed Cowbird, 2; House Finch, 2; Mourning Dove, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Black-capped Chickadee, 1; Solitary Vireo, 1; Spotted Sandpiper, 0.5; Black Phoebe, 0.5; W. Wood Pewee, 0.5; Lazuli Bunting, 0.5. **Total:** 21 species; 70 territorial males or females (692/km², 280/100 acres). **Visitors:** Am. Kestrel, Band-tailed Pigeon, Belted Kingfisher, Yellow-bellied Sapsucker, Say's Phoebe, Violet-green Swallow, W. Tanager, Am. Goldfinch. **Remarks:** On census days campers totaled 4538, or 95.6% of campground capacity, for an average of 378 (3736/km², 1512/100 acres). Band-tailed Pigeons and W. Tanager, summer residents on the Zion plateaus, dropped down to the lowlands to feed on mulberries and cherries in the campground. The Black Phoebes nested in a culvert 50 yds from the plot, but fed exclusively along the river at the SW corner.—JEROME L. GIFFORD, P.O. Box 85, Springdale, UT 84767.

162. SLICKROCK-PONDEROSA PINE-PYGMY FOREST-CHAPARRAL. — **Location:** Utah, Washington Co., Zion Nat'l Park, unsurveyed area along Zion-Mt. Carmel highway, with S center of plot at the confluence of Pine and Clear Creeks, 37°12'53"N, 112°56'04"W; Zion Nat'l Park Topographic Map (Zion Canyon Section), USGS. **Continuity:** Established 1980. **Size:** 16.19 ha = 40 acres. **Description of Plot:** See AB 35: 91-92 (1981). **Weather:** May rainfall above average, with temperatures below normal; June and July hotter than average, with heavy rains on June 29, July 12 and 16. **Coverage:** May 3, 17, 24, 31; June 6, 12, 19, 28; July 3, 12, 18; 0545-1005, MDT. Total man-hours: 31.9. **Census:** Bushtit, 9 (56, 23), Black-throated Gray Warbler, 5 (31, 13), Cassin's Finch, 5; Rufous-sided Towhee, 5; hummingbirds (Black-chinned and Broad-tailed), 4 (25, 10); White-breasted Nuthatch,

4; Plain Titmouse, 3 (19, 8); Gray Vireo, 3; Rock Wren, 2; Brown-headed Cowbird, 2; Lesser Goldfinch, 2; Ash-throated Flycatcher, 1.5; Com. Flicker, 1; W. Wood Pewee, 1; Cañon Wren, 1; Blue-gray Gnatcatcher, 1. **Total:** 17 species; 49.5 territorial males and females ($306/\text{km}^2$, 124/100 acres). **Visitors:** Cooper's Hawk, White-throated Swift, Violet-green Swallow, Com. Raven, House Finch. **Remarks:** Bushtits nested early, with flocks of young roaming the plot on June 6. Rufous-sided Towhee, new this year, was expected last year, but was not found; the species is increasing after being scarce for several years. Two ♂ Black-chinned Hummingbirds were displaying on June 19; the plot is about 1000 ft above their usual range at Zion. Also new this year were both wren species, Blue-gray Gnatcatcher and Lesser Goldfinch.—*JEROME L. GIFFORD, P.O. Box 85, Springdale, UT 84767.*

163. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — **Location:** Oregon; Grant Co., Bates, 1/4 mile E. of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973; 9 consecutive years. **Size:** 32.38 ha = 80 acres. **Description of Plot:** See AB 27: 1002-1003 (1973). **Weather:** Temperatures 30-64°F; clear on 8, partly cloudy on 1 census. Rainfall amounted to 1.10 in during period June 28-July 31. Fall and winter precipitation was below normal but spring precipitation was well above. **Coverage:** June 28-29; July 1, 3-4, 6, 8, 10, 18; 0546-0752 hours, PDT. Total man-hours: 17. **Census:** Chipping Sparrow, 15 (46, 19); Cassin's Finch, 9 (28, 11); White-crowned Sparrow, 7 (22, 9); Ruby-crowned Kinglet, 5 (15, 6); Yellow-rumped Warbler, 5; Am. Robin, 3 (9, 4); Lincoln's Sparrow, 3; Fox Sparrow, 2; Com. Flicker, 1; Mountain Chickadee, 1; Mountain Bluebird, 1. **Total:** 11 species; 52 territorial males ($161/\text{km}^2$, 65/100 acres). **Visitors:** Steller's Jay, Clark's Nutcracker, Pine Siskin, Red Crossbill, Dark-eyed Junco. **Remarks:** Nests found: Com. Flicker, 1; Mountain Bluebird, 1; Census showed a slight rise in territorial males for the second year, from 48 in 1980 to 52. I am grateful to the Malheur Nat'l Forest Staff for their cooperation.—*ROBERT A. HUDSON, P.O. Box 81, Bates, OR 97817.*

164. STABLE COASTAL SAND DUNES. — **Location:** California; Monterey Co., Salinas River State Beach, 2.3 km S of the pier in Moss Landing; 36°47'N, 121°48'W, Moss Landing Quadrangle, USGS. **Continuity:** New. **Size:** 9.4 ha = 23.2 acres (rectangular, with one irregular edge, surveyed with compass and 50 m tape). **Description of Plot:** Covers the sand dunes behind a 340 m section of ocean beach. The dunes and plot extend 210-340 m inland from approximate mean high tide line. Vegetation was sampled by running 4 randomly placed line transects at right angles to the beach, then randomly selecting 62 m² sites along the 4 transects. For each site plant cover was estimated visually. The vegetation sampling was carried out from January through March, 1980, during the period of maximum annual growth. The vegetation is strongly zoned with respect



Breeding Bird Census 162, Upper Pine Creek in Zion Nat'l Park. Photo/Jerome Gifford.

to the ocean. Dominant plants are: Ice Plant (*Mesembryanthemum chilense*) on the primary dune (the dune closest to the beach); Beach Sagewort (*Artemisia pycnocephala*) on the secondary dune; and Mock Heather (*Haplopappus ericoides*) on the tertiary dunes. Other plants are dominant in restricted niches: Sand Bluestem (*Poa douglasii*) in dry slacks between secondary and tertiary dunes; Live-forever (*Dudleya farinosa*) at exposed locations in the tertiary dunes; Foxtail Fescue (*Festuca megalura*) in dry areas along the back edge of the dunes; and Slough Sedge (*Carex obnupta*) in wet areas in the back dunes. Species accounting for 90% of the total cover, followed by: 1) average cover (%), 2) relative frequency (%), 3) average distance from mean high tide of sample sites containing the species (m), 4) standard deviation of these distances: Shrubs: Mock Heather, 19.8, 52, 175, 76; Beach Sagewort, 3.9, 24, 49, 23; Golden Yarrow (*Eriophyllum staechadifolium*), 2.4, 10, 123, 32; Pacific Blackberry (*Rubus ursinus*), 1.9, 5, 282, 66; Tibinagua (*Eriogonum latifolium*), 0.7, 16, 237, 75. Total vegetative cover was 77%; shrubs 31%, herbaceous perennials 21%, and annuals 25%; bare sand 29%; 78 plant species were found; 12 shrubs, 31 herbaceous perennials, and 35 annuals and biennials; average maximum height of vegetation in sample sites was 36 cm; primary dune 18 cm, secondary 22, tertiary 46; a few individuals of Chaparral Broom (*Baccharis pilularis*) reach 2 m near the inland edge of the dunes. Two seldom-used vehicle tracks lie between the primary and secondary, and secondary and tertiary dunes. **Edge:** Bounded N and S by similar habitat, W by ocean beach, and E by a dirt road bordering an artichoke field. A tidal slough lies 150 m E of the plot. **Topography:** Two dune ridges run parallel to the short, steep beach, with crests approximately 13 and 50 m from mean high tide line. The primary ridge averages 3 m and the secondary 4 m in height. Behind these lie a complex of dunes running primarily NW-SE, and rising 5-10 m above mean high tide. A 17 m sand hill dominates the SE corner of

the plot. A sand movement study showed that the primary dune is growing at the rate of 2-5 cm/year, but is subject to occasional erosion in winter. The other dunes have remained stable over the past year. **Elevation:** 1-17 m. **Weather:** Exceptionally mild all spring. Prevailing NW wind less frequent and severe than normal. Fog less frequent than normal. Rainfall slightly below normal for the year, with only trace amounts during the study period. **Coverage:** Mar. 25, 31; Apr. 1, 11; May 1, 13-14; June 14, 24, 28; 0600-1200 and 1600-1930 hours. Total man-hours: 23. **Census:** California Quail, 12 (128, 52); Bewick's Wren, 11 (117, 47); House Finch, 9 (96, 39); White-crowned Sparrow, 8 (85, 34); Mourning Dove, 5 (53, 22); Savannah Sparrow, 4 (43, 17); Horned Lark, 2; Mockingbird, 2; Red-winged Blackbird, 2; Mallard, 1; Loggerhead Shrike, 1. **Total:** 11 species; 57 territorial males or females ($607/\text{km}^2$, 246/100 acres). **Visitors:** White-tailed Kite, Red-tailed Hawk, Marsh Hawk, Snowy Plover, W. Gull, Allen's Hummingbird, Barn Swallow, Cliff Swallow, Com. Crow, Orange-crowned Warbler, W. Meadowlark, Brewer's Blackbird. **Remarks:** The distribution of birds reflected the vegetation zonation. Savannah Sparrows and Horned Larks held territories in the short vegetation on the primary and secondary dunes. California Quail, Bewick's Wrens, and White-crowned Sparrows preferred the thick clumps of *Haplopappus* and other shrubs in the tertiary dunes. The diverse vegetation found in moist areas along the E edge of the dunes attracted the Mockingbirds, Red-winged Blackbirds, and House Finches. The Red-winged Blackbirds and House Finches appeared to do most of their feeding in the adjacent artichoke field, while maintaining territories in the study area. Nests found: Mallard, 1; California Quail, 1; Mourning Dove, 4; Loggerhead Shrike, 1. Fledglings of California Quail, Bewick's Wren, House Finch, and White-crowned Sparrow were seen.—*DAVID HOULE, Ecology and Evolution Dept., SUNY at Stony Brook, Stony Brook, NY 11794.*

165. URBAN PARK-LAKE, MARSH AND MIXED FOREST. — **Location:** California; City and County of San Francisco, Golden Gate Park, North Lake, S of the 43rd Ave and Fulton St entrance to the park; 37°46'N, 122°30'W, San Francisco N Quadrangle, USGS. **Continuity:** New. **Size:** 4.99 ha = 12.33 acres (irregularly oblong plot measured from "Golden Gate Park Irrigation and Domestic Water Systems" (map), Drawing #15,555, Board of Park Commissioners, Division of Engineers, San Francisco, CA (May 19, 1941). **Description of Plot:** See AB 36 (1)48, this issue. **Weather:** Temperatures 55-68°. Skies were generally clear, with overcast on 3 occasions and rain on 1. Wind never exceeded 10 mph. **Coverage:** Mar. 15, 21, 27, 29; Apr. 13, 16, 26; May 2, 16, 19, 25, 31; June 5, 7, 17; July 4; 0650-1600 hours, PST. Total man-hours: 18.883. **Census:** Song Sparrow, 20 (401, 162); Brewer's Blackbird, 16 (321, 130); Allen's Hummingbird, 15 (301, 122); Mourning Dove, 8 (160, 65); Am. Robin, 8; Mallard, 5 (100, 41); Chestnut-backed Chickadee, 5; House Finch, 4 (80, 32); Tree Swallow, 3 (60, 24); Red-winged Blackbird, 3; Pine Siskin, 3; White-crowned Sparrow, 3; Downy Woodpecker, 2; Starling, 2; Violet-green Swallow, 1; Barn Swallow, 1; Olive-sided Flycatcher, 1; Bushtit, 1; Brown-headed Cowbird, 1; Dark-eyed Junco, 1. **Total:** 20 species; 103 territorial males or females (2064 km²; 835/100 acres). **Visitors:** Wood Duck, California Quail, Band-tailed Pigeon, Rock Dove, Com. Flicker, Rough-winged Swallow, Cliff Swallow, Pygmy Nuthatch, Brown Creeper, House Sparrow, Purple Finch, Brown Towhee. **Remarks:** Nests found: Brewer's Blackbird, 3; Am. Robin, 1; Starling, 1. Mallards hatched at least 3 clutches but most of the young failed to survive. In addition to nesting birds and visitors the lake and its environs were used by 29 other species. Of these 19 were winter residents; 9 were migrants. The small colony of Brewer's Blackbirds was of interest since it probably dispersed from a colony of 300-500 birds that uses the nearby Buffalo Paddock during the rest of the year. The blackbirds were absent before and after the nesting period and seemed to forage in the forest to the W much of the time.—*DANIEL P. MURPHY, 2945 Ulloa St, San Francisco, CA 94116.*

166. URBAN PARK-MATURE MIXED CONIFEROUS FOREST. — **Location:** California; City and County of San Francisco, Golden Gate Park, W of the 43rd Ave. and Fulton St entrance to the Park; 37°46'N, 122°30'W, San Francisco N Quadrangle, USGS. **Continuity:** New. **Size:** 8.38 ha = 20.7 acres (irregular plot measured from a map of Reforestation Unit 6 in the "Reforestation Practices and Procedures"; Golden Gate Park, San Francisco, CA, 8/26/80. **Description of Plot:** See AB 36 (1)47, this issue. **Weather:** Temperatures were moderate, 52-70°F. Skies overcast during 6 visits and clear on 5. **Coverage:** Mar. 21, 29; Apr. 14, 16, 25; May 9, 16, 30; June 7, 19; July 4; 0625-1100 hours, PST. Total man-hours: 14.25. **Census:** Mourning Dove, 13 (155, 63); Dark-eyed Junco, 11 (131, 53); Allen's Hummingbird, 10 (119, 48); Pygmy Nuthatch, 8 (95, 39); Am. Robin, 5 (60, 24); Downy Woodpecker, 4 (48,

19); White-crowned Sparrow, 3 (36, 14); Chestnut-backed Chickadee, 2; Brown-headed Cowbird, 2; Brown Towhee, 2; Olive-sided Flycatcher, 1; Scrub Jay, 1; Bushtit, 1; Red-breasted Nuthatch, 1. **Total:** 14 species; 64 territorial males or females, (764/km², 309/100 acres). **Visitors:** Mallard, California Quail, Rock Dove, Tree Swallow, Brown Creeper, Starling, House Sparrow, Brewer's Blackbird, House Finch, Pine Siskin, Song Sparrow, **Remarks:** At least 3 Anna's Hummingbirds utilized the plot, but that species generally breeds before the arrival of Allen's Hummingbirds in mid-February. The following nests were found: Allen's Hummingbird, 1; Pygmy Nuthatch, 3; Am. Robin, 1; Downy Woodpecker, 1; Red-breasted Nuthatch, 1. A Brown Towhee was noted feeding a juvenile. The condition of the forest continues to deteriorate; 2 trees fell during the study and 1 shortly after.—*DANIEL P. MURPHY, 2945 Ulloa St, San Francisco, CA 94116.*

167. DESERTSCRUB-RIPARIAN. — **Location:** Arizona; Pima Co., NW ¼ of section 16 of T 14 S, R 13 E; 32°12'N, 111°1'W, Cat Mountain Quadrangle, USGA. Located at Tumamoc Hill, a 351.78 ha (869-acre) tract owned by the Univ. of Arizona, fenced with barbed wire since 1907. Located Tucson at the corner of West Anklam and Greasewood Rds. **Continuity:** New. **Size:** 20.23 ha = 50 acres (1320 × 1650 ft, paced with a compass). **Description of Plot:** Desertsrub interdigitated with riparian habitat. Species com-

position and coverage were estimated by five 100 transects. The substratum is composed of 44% gravel or small rock (< 5.1 cm or 2 in.), 29% litter, 25% rocky (> 5.1 cm or 2 in.), 2% bare. Species composition is 42.6% Bur Sage (*Ambrosia deltoidea*), 14% Creosotebush (*Larrea tridentata*), 9.7% Com. Mesquite (*Prosopis juliflora*), 8.3% Paper Flower (*Psilosotrophe cooperi*), 4.9% Little Leaf Palo Verde (*Cercidium microphyllum*), 4.2% Prickly Pear (*Opuntia engelmannii*), 3% Ocotillo (*Fouquieria splendens*), 2.8% Krameria grayii, 2.1% Acacia greggii and constricta, 2.1% Staghorn Cholla (*O. versicolor*), 1% Saguaro (*Carnegiea gigantea*). 1% include Mormon Tea (*Ephedra trifurca*) Pencil Cholla. **Topography:** Flat to rolling, dissected by several washes, the main wash running N-S near the E border and two branch washes traversing from E to W. **Elevation:** 740-750 m (2428-2460 ft). **Edge:** Bordered on all sides by at least 91.5 m (300 ft) of similar habitat. The 869 acre Tumamoc Hill tract has become almost surrounded by housing developments and schools. There is no water on the 20.23 ha plot, but there are two old clay pits on the Tumamoc Hill property which sometimes contain water. There is a small permanent concrete water hole on the Tumamoc property about ½ mile from the plot. **Weather:** Temperature, 40°-80°F in March, 78°-106° in July with sunshine, except for rain on March 20. **Coverage:** March 15-22, May 3, 17; June 19, 22, 28; July 5. Total man-hours: 50. **Census:** Mourning Dove, 11 (54, 22); Curve-billed Thrasher, 10 (49, 20); Ver-



Breeding Bird Census 167, Tumamoc Hill, Tucson, Ariz. (background), Ocotillo (left foreground); Little-leaf Palo Verde and Saguaro (center foreground). Photo/Glynn Webb.

din, 6 (30, 12); Cactus Wren, 6; Gambel's Quail, 5 (25, 10); White-winged Dove, 5; Gila Woodpecker, 5; Com. Flicker, 4 (20, 8); Pyrrhuloxia, 4; House Finch, 4; Lesser Nighthawk, 2; Ladder-backed Woodpecker, 2; Ash-throated Flycatcher, 2; Black-tailed Gnatcatcher, 2; Phainopepla, 2; Starling, 2; Brown-headed Cowbird, 2; Black-throated Sparrow, 2; Roadrunner, 1; Elf Owl, 1; Anna's Hummingbird, 1; Purple Martin, 1; House Sparrow, 1; Cardinal, 1; Rufous-winged Sparrow, 1. **Total:** 25 species; 83 territorial males ($410/\text{km}^2$, 166/100 acres). **Visitors:** Black-chinned Hummingbird, Mockingbird, Brown Towhee. **Remarks:** Nests found: 10 Mourning Dove, 9 Curve-billed Thrasher, 4 White-winged Dove, 1 Elf Owl, 1 Purple Martin, 1 Cactus Wren, several Verdin.—*GLYNN WEBB, Science Dept., Pima College, Tucson, AZ 85709.*

BREEDING BIRD POPULATIONS OF COASTAL SAGE SCRUB COMMUNITIES IN SOUTHWESTERN CALIFORNIA

The following 3 censuses were conducted on 20-acre plots; all have a history of cattle grazing, which was apparently abandoned prior to 1970. Plots were located by using aerial photos (scale 1: 2400) and were marked and placed using a hand compass. Vegetation coverage and frequency were determined by line intercept sampling.

Weather data provided by the Escondido Fire Dept. indicate temperatures were above average through the census period while rainfall was above average for March, below average for April-June.

Coastal sage scrub is disappearing at an alarming rate because of the very rapid expansion of real estate and agriculture. Preservation efforts are needed to maintain populations of several of the scarcer birds.—*KENNETH L. WEAVER, 1339 Taylor Place, Escondido, CA 92027.*

168. COASTAL SAGE SCRUB I.—**Location:** California, San Diego Co., Escondido, E of Bear Valley Pkwy, N of El Dorado Dr., W of Summit Dr., and S of Valencia Dr., $33^{\circ}06'N$, $117^{\circ}02'W$, Escondido Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (660×1320 ft), long axis NW-SSE. **Description of Plot:** A low ridge and its SE and SW-facing slopes, which are cut by 4 dry washes. Dirt roads roughly bisect the middle of the plot along both short and long axes. The San Diego Aqueduct passes lengthwise under the plot. Vegetation coverage 92%. Plant species in order of dominance are: Coastal Sagebrush (*Artemisia californica*), 36%; California Buckwheat (*Eriogonum fasciculatum*), 27.8%; alien and native herbs, 12.2%; grasses, 9.1%; Prickly-Pear (primarily *Opuntia oricola*), 8%; Monkeyflower (*Mimulus* sp.), 3%; White Sage (*Salvia apiana*), 2.6%; and Elderberry (*Sambucus mexicana*), 1%. Vegetation is typically 1 m or less in height although individual Prickly-Pears reach 2 m and some Elderberries reach 4-5 m. **Edge:** Surrounded on all sides by similar vegetation. An avocado grove approaches within 40 m of the extreme NW corner and riparian woods occur 6 m E of the

E border. **Elevation:** 620-700 ft. **Coverage:** February 28; March 7, 14, 28; April 11, 21; May 3, 9, 17; June 8, 20; 0430-1000 and 1500-1800, PST. Total man-hours: 18. **Census:** Brown Towhee, 11 (136, 55); Rufous-sided Towhee, 5 (62, 25); Anna's Hummingbird, 4 males (49, 20); Black-tailed Gnatcatcher, 4; Cactus Wren, 3 (37, 15); California Quail, 2.5; Bushtit, 2.5; Wrentit, 2; Lazuli Bunting, 2; Rufous-crowned Sparrow, 2; Roadrunner, 1; Bewick's Wren, 1; California Thrasher, 1; White-tailed Kite, +. **Total:** 14 species; 41 territorial males ($507/\text{km}^2$, 205/100 acres). **Visitors:** Cooper's Hawk, Am. Kestrel, Mourning Dove, Black-chinned Hummingbird, Costa's Hummingbird, Black Phoebe, Ash-throated Flycatcher, Com. Crow, House Wren, Mockingbird, Blue Grosbeak, House Finch, Lesser Goldfinch. **Remarks:** Nests found: Roadrunner, 1; Bushtit, 2; Cactus Wren, 3 (excluding dummy nests); Black-tailed Gnatcatcher, 3. Gnatcatchers and Rufous-crowned Sparrows held territories centered on dry washes. The hummingbirds, Wrentits, Lazuli Buntings, and Rufous-sided Towhees were closely associated with the scattered Elderberries. Presence of the Black-tailed Gnatcatchers on this and the following 2 plots is of note as the coastal race (*californica*) is now very scarce N of the Mexican border. This plot is slated for residential development.

169. COASTAL SAGE SCRUB II.—**Location:** California, San Diego Co., Escondido, N of Lake Hodges, E of I-15, and S of Sierra Linda Dr., $33^{\circ}03'N$, $117^{\circ}03'W$, Escondido Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (660×1320 ft), long axis ENE-WSW. **Description of Plot:** On a SW-facing hillside, dissected by 6 dry washes. Vegetation coverage: 85.2%. Plant species in order of dominance are: California Buckwheat, 46.2%; grasses, 19%; alien and native herbs, 16.2%; Coastal Sagebrush, 11.3%; Deerweed (*Lotus scoparius*), 3.8%; and Prickly-Pear (*Opuntia oricola*), 3.5%. Vegetation is typically less than 1 m in height except for some Prickly-Pears and several individuals of the very scarce Elderberry which reach heights as described in Census 168. Several small rock outcrops occur on the lower slopes. **Edge:** Surrounded on all sides by similar vegetation. **Elevation:** 380-580 ft. **Coverage:** February 28; March 7, 21; April 5, 11, 18; May 3, 17; June 26; 0430-0900, PST. Total man-hours: 19. **Census:** Brown Towhee, 8.5 (105, 43); Rufous-crowned Sparrow, 5 (62, 25); Sage Sparrow, 4.5 (56, 23); Black-tailed Gnatcatcher, 3.5 (43, 18); California Quail, 2; Cactus Wren, 2; Bushtit, 1; Bewick's Wren, 1; Mockingbird, 1; California Thrasher, 1; Roadrunner, 0.5; White-tailed Kite, +; W. Meadowlark, +. **Total:** 13 species; 30 territorial males ($371/\text{km}^2$, 150/100 acres). **Visitors:** Marsh Hawk, Am. Kestrel, Costa's Hummingbird, W. Kingbird, Cassin's Kingbird, Blue Grosbeak, Lazuli Bunting, House Finch, Lesser Goldfinch, Lawrence's Goldfinch. **Remarks:** Nests found: Cactus Wren, 2 (excluding dummy nests); Black-tailed Gnatcatcher, 1. All passerines, except the W. Meadowlark, had territories closely centered on the dry washes. In addition to the gnatcatcher, popu-



Breeding Bird Censuses 168-170, Coast Prickly-Pear with one of the dominant plants of the coastal sage scrub, the white-flowered California Buckwheat. Photo/Kenneth L Weaver.

lations of the Roadrunner, Cactus Wren, and Sage Sparrow (race *bella*) are also becoming quite localized on the S. California coastal slope. This plot will become part of a large residential development.

170. COASTAL SAGE SCRUB III.—**Location:** California, San Diego Co., Kit Carson Park in Escondido; $33^{\circ}04'N$, $117^{\circ}03'W$, Escondido Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (660×1320 ft, long axis N-S). **Description of Plot:** A ridge top and its S and SE-facing slopes, cut by numerous eroded gullies. A dirt road crosses the W 1/3 of the plot and divides into several smaller roads in the S 1/5 of the plot. Vegetation coverage: 93.8%. Plant species in order of dominance are: California Buckwheat, 68%; alien and native herbs, 12.2%; California Sagebrush, 11.1%; and grasses, 8.7% Vegetation is almost entirely 1 m or less in height. **Edge:** Bordered on the N by an abandoned orange grove, surrounded on the remaining 3 sides by similar vegetation. Riparian woods parallel the W border at a distance of about 60 m. **Elevation:** 380-480 ft. **Coverage:** March 8, 14, 21, 28; April 5, 18, 21, 25; May 3, 9, 17, 30; June 26; 0400-1030 and 1430-1600, PST. Total man-hours: 14. **Census:** Brown Towhee, 9 (111, 45); Black-tailed Gnatcatcher, 4 (49, 20); Bushtit, 2; Rufous-sided Towhee, 2; California Quail, 1; California Thrasher, 1; Song Sparrow, 1; Bewick's Wren, 0.5; White-tailed Kite, +. **Total:** 9 species; 20.5 territorial males ($253/\text{km}^2$, 103/100 acres). **Visitors:** Mourning Dove, Roadrunner, Costa's Hummingbird, Anna's Hummingbird, Com. Flicker, Wrentit, Loggerhead Shrike, W. Meadowlark, Blue Grosbeak, Lazuli Bunting. **Remarks:** Nests found: Bushtit, 1; Black-tailed Gnatcatcher, 3; Song Sparrow, 1. The low diversity of vegetation and lack of significant topographical features appear to severely limit the breeding bird population. Most birds frequented the more heavily vegetated gullies. A proposed park "meadow" will destroy much of the scrub habitat; however, the Escondido Parks and Recreation Dept. is re-

considering this plan following notification of the presence of the gnatcatchers.

171. COASTAL SCRUB. — **Location:** California, Marin Co., 4 mi NW of Bolinas and 0.5 mi inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 9 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 25: 1003-1004 (1971). **Weather:** Clear skies, 48%; partly cloudy, 36%; overcast, 7%; foggy, 7%; and light rain, 2%. Winds were generally SW to WNW at 1-10 knots, somewhat lighter than most years. Morning temperatures, 48-73°F, were about average. The period April-June was very dry with rainfall totalling only 0.74 inches. Rainfall for the year (July 1980-June 1981) totalled 24.87 in. and was also somewhat below normal. **Coverage:** April 1-5, 8-11, 13, 15-17, 21-22, 25-28; May 2, 4-8, 10-13, 15, 17, 19-23, 25-31; June 1-12, 14-18, 20-27, 29-30; 0630-1230. Total man-hours: 205. **Census:** Wrentit, 15 (185, 75); White-crowned Sparrow, 8 (99, 40); Allen's Hummingbird, 5.5 (68, 28); Song Sparrow, 4.5 (56, 23); Rufous-sided Towhee, 4 (49, 20); Bewick's Wren, 3.5 (43, 18); Bushtit, 2; Scrub Jay, 1.5; Orange-crowned Warbler, 1.5; House Finch, 1; Red-tailed Hawk, +; Com. Flicker, +; Purple Finch, +; Grasshopper Sparrow, +. **Total:** 14 species; 46.5 territorial males ($575/\text{km}^2$, 233/100 acres). **Remarks:** The breeding bird density was very similar to the mean density recorded over the past 8 years ($562/\text{km}^2$). The density has, in fact, remained remarkably constant over the past decade, thus reflecting the inherent stability of the breeding bird community of this nature habitat. The number of breeding species decreased by 1 as a result of the disappearance of California Quail and Am. Goldfinch, and the appearance of Grasshopper Sparrow. This last species has not been recorded as breeding in this general area since 1972. The densities of 2 species of breeding seedeaters (Song Sparrow and Rufous-sided Towhee) were noted to decline sharply in 1980, presumably as a result of low winter survival. The density of Song Sparrows appears to be stabilized at this low level but the density of Rufous-sided Towhees continues to decline. In general, the breeding season was 2-3 weeks later than in 1980, presumably because of a stretch of cold rainy weather in late March. Nests found (29): Scrub Jay, 1; Bushtit, 1; Wrentit, 12; Bewick's Wren, 2; Rufous-sided Towhee, 2; White-crowned Sparrow, 10; Song Sparrow, 1. Contribution No. 235, PRBO.—**PATSY CHRISTGAU, DAVE DeSANTE, DAVID GREEN, JULIE LANE, BILL SYDEMAN, and MARGUERITE TROCMÉ, Point Reyes Bird Observatory, 4990 Shoreline Hwy., Stinson Beach, CA 94970.**

172. DISTURBED COASTAL SCRUB A. — **Location:** California; Marin Co., 3.5 mi NW of Bolinas and just inside the S boundary of Point Reyes Nat'l Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1972; 9 intermittent years. **Size:** 4.7 ha = 11.6 acres. **Description of Plot:** See AB 26:987-988 (1972). **Weather:**

See Census 171. **Coverage:** Apr 2-3, 8, 15-17, 26, 28; May 5, 7-8, 10, 14-15, 21-23, 25, 27, 29, 31; June 2, 4, 10, 21, 23-24, 26; 0630-1230. Total man-hours: 98. **Census:** Song Sparrow, 7.5 (160, 65); Wrentit, 5 (107, 43); Allen's Hummingbird, 3.5 (75, 30); Am. Goldfinch, 2.5; Rufous-sided Towhee, 2.5; White-crowned Sparrow, 2.5; California Quail, 1.5; Scrub Jay, 1; Bushtit, 1; Bewick's Wren, 0.5; Orange-crowned Warbler, 0.5; Purple Finch, 0.5; Red-tailed Hawk, +; Com. Flicker, +; Am. Robin, +; Brown-headed Cowbird, +; House Finch, +; Brown Towhee, +. **Total:** 18 species; 28.5 territorial males ($607/\text{km}^2$, 246/100 acres). **Remarks:** The breeding bird density of this plot has shown a steady increase over the past 5 years, presumably because of recovery of the vegetation from the 1976-77 drought and the gradual succession of the vegetation toward a mature coastal scrub. The most pronounced and consistent increases have been noted in Allen's Hummingbird, Wrentit, and Rufous-sided Towhee, all of which prefer the more dense type of coastal scrub typical of mature scrub habitat. The breeding bird density actually exceeded the density of undisturbed coastal scrub habitat ($575/\text{km}^2$), presumably because of the close proximity of an adjacent densely wooded arroyo and the nearby field station that allowed "edge" species to occur. In general, the breeding season was 2-3 weeks later than in 1980, presumably because of a stretch of cold rainy weather in late March. Nests found (29): Scrub Jay, 1; Wrentit, 5; Am. Goldfinch, 1; Rufous-sided Towhee, 3; White-crowned Sparrow, 4; Song Sparrow, 15. Contribution No. 236, PRBO.—**TIMMS R. FOWLER, DAVE DeSANTE, BARBARA DIEHL, GEOFF GEUPEL, and JIM WALTERMAN, Point Reyes Bird Observatory, 4990 Shoreline Hwy., Stinson Beach, CA 94970.**

173. 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; 10 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 25:1002-1003 (1971). **Weather:** See Census 171. **Coverage:** Apr. 1, 3-4, 8-9, 11, 16-17, 20, 27-29; May 1, 4-6, 11, 15, 19-22, 26-29, 31; June 1, 3-4, 9, 11-12, 15, 17-18, 21-26, 29-30; 0630-1230. Total man-hours: 264. **Census:** Song Sparrow, 14 (173, 70); White-crowned Sparrow, 10.5 (130, 53); Wrentit, 4 (49, 20); Rufous-sided Towhee, 4; Allen's Hummingbird, 3.5 (43, 18); Am. Goldfinch, 3 (37, 15); California Quail, 2.5; Bushtit, 2; Bewick's Wren, 1.5; Scrub Jay, 0.5; Am. Robin, 0.5; W. Bluebird, 0.5; Starling, 0.5; Brown-headed Cowbird, 0.5; Com. Flicker, +; House Finch, +. **Total:** 16 species; 47.5 territorial males ($587/\text{km}^2$, 238/100 acres). **Remarks:** See Census 172. An increase has been noted in virtually all breeding species. The breeding density reached the level of the undisturbed coastal scrub habitat ($575/\text{km}^2$). The increased use of this plot by birds nesting around the nearby field station (e.g. Am. Robin, W. Bluebird, Starling) also contributed to the higher breeding bird density found in 1981. Unusually stormy weather in

late March of 1981 may have been responsible for a 2-3 week delay in the onset of nesting. Two White-crowned Sparrow nests were parasitized by Brown-headed Cowbirds. Neither of the cowbird eggs hatched. This is the first record of cowbird parasitism of White-crowned Sparrow nests in ten years of study of these plots. Nests found (54) Scrub Jay, 1; Bushtit, 2; Wrentit, 4; Rufous-sided Towhee, 5; White-crowned Sparrow, 16; Song Sparrow, 26. Contribution No. 237, PRBO.—**ROD MACDONALD, DAVE DeSANTE, JOANNE YOUNG, Point Reyes Bird Observatory, 4990 Shoreline Hwy., Stinson Beach, CA 94970.**

174. COLORADO DESERT FLOODPLAIN. — **Location:** California; Riverside Co., E flank of Santa Rosa Mountains on the floodplain of Magnesia Spring Canyon, just above the city of Rancho Mirage; center W 1/2 Sec. 13, T5S, R5E, Ranch Mirage Quadrangle, USGS. **Continuity:** New. **Size:** 20.3 ha = 50.2 acres (irregular in shape, roughly square; planimetric measurements from 1:14,000 scale aerial photo). **Description of Plot:** Roughly the north-central 33% of what remains undeveloped of the floodplain above the city of Rancho Mirage. An earthen levee and channel now conduct all but the extremely highest flood flows away from the natural floodplain. A centrally located boulder-strewn mound of rocky alluvium and a narrower belt of identical substrate along the NW border comprise about 55% of the plot. The remainder is made up of lower lying sandy deposits and wash bottom. The composition of perennial plants was estimated with a total of 20-100m line intercept transects, 10 along the sandier substrate and washes and 10 on the rocky alluvium. Shrubs occurred in clumps in the wash, somewhat regularly spaced, whereas on the rocky alluvium, individual shrubs were regularly spaced. Total cover contributed by perennials on the sandy alluvium was 18.8% as compared to 8.4% on the rocky alluvium. The dominant species on the sandy alluvium were (figures following each species are % cover, % relative frequency): Cheesebush (*Hymenoclea salsola*) 6.34, 31; Indigo Bush (*Dalea schottii*) 2.11, 7.9; Brandegea bigelovii 2, 8.6; Sweet Bush (*Bebbia juncea*) 1.9, 13.2; Desert Lavender (*Hyptis emoryi*) 1.21, 4.6; Creosote (*Larrea tridentata*) 0.85, 2; Catclaw (*Acacia greggii*) 0.66, 3.3; Silver Cholla (*Opuntia echinocarpa*) 0.33, 4; Smoke Tree (*D. spinosa*) 0.18, 2; and dead perennials 3, 21.2. The dominant species on the rocky alluvium were: Creosote 2.65, 18.8; Cheesebush 1.75, 20.8; Sweetbush 1.09, 13.9; *Hoffmansegia microphylla* 0.67, 7.9; Indigo Bush 0.47, 5; Burro-brush (*Ambrosia dumosa*) 0.15, 2; Desert-straw (*Stephanomeria pauciflora*) 0.09, 2; and dead perennials 1.45, 25.7. The only abundant low herbaceous cover was contributed by Sandmat (*Euphorbia polycarpa*), which was abundant over the entire plot. Cover contributed by Sand-mat was estimated at 7.4% (from one 25m stretch of line intercept). An abandoned well was located near the center of the NE boundary. A ring of 50 Tamarisk trees (*Tamarix sp.*) rims the well site, enclosing an area of about 32 by 21m. The trees were only sparsely foliated but did provide some cover

and perches to about 9m high. Two dirt roads parallel along the length of the central alluvial mound with several short spur roads connecting the two near the NE boundary. The roads are little traveled and partially overgrown. Minor vehicle travel occurs in the SE wash. **Edge:** Similar habitat occurs on 3 sides. A dirt road and earthen channel maintained for flood control purposes, border the NW side. Beyond this disturbed area, the hills rise abruptly. Creosote bush scrub occurs on the hillsides with abundant perennials including Creosote, Brittle-bush (*Encelia farinosa*), Burro-bush, and Six-week Three-awn (*Aristida adscensionis*). Arrow-Leaf (*Pleurocoronis pluriseta*), Linear-leaved Goldenbush (*Haplopappus linearifolius*), Desert Tobacco (*Nicotiana trigonophylla*), Rock Daisy (*Perityle emoryi*), and Desert Fir (*Peucephalium schottii*) were particularly abundant on rock outcrops and steeper rocky slopes. **Topography:** The terrain slopes gently from the SW at approximately 440 ft (134 m) to the NE at 360 ft (110 m). **Weather:** Fierce wind precluded total coverage during 1 census; otherwise clear and sunny. Temperatures varied from approximately 49°F during early morning to 95° by late morning. **Coverage:** Mar. 25-26; Apr. 7, 9, 28-29; 0600-0845. Total man-hours: 15. **Census:** Black-throated Sparrow, 15 (74, 30); Gambel's Quail, 8.5 (42, 17); Verdin, 7 (34, 14); Mourning Dove, 3 (15, 6); Cactus Wren, 3; Costa's Hummingbird, 2; House Finch, 2; Mockingbird, 1; Black-tailed Gnatcatcher, 1; Loggerhead Shrike, 1; Say's Phoebe, +; Rock Wren, +; Brown-headed Cowbird, +; Brewer's Sparrow, +. **Total:** 14 species; 43.5 territorial males or females (214/km², 87/100 acres). **Visitors** (numbers are maximum observed on any one visit, total observed during all visits): Prairie Falcon, 1, 1; Gambel's Quail, 18, 42; Mourning Dove 18, 43; Ground Dove, 1, 1; Barn Owl, 1, 1; Poor-will, 1, 1; White-throated Swift, 4, 9; W. Kingbird, 1, 1; Ash-throated Flycatcher, 5, 7; Say's Phoebe, 1, 2; Violet-green Swallow, 3, 3; Com. Raven, 5, 5; Com. Crow, 1, 1; Rock Wren, 3, 3; Phainopepla, 2, 3; Nashville Warbler, 2, 2; Yellow-rumped Warbler, 2, 4; Hooded Oriole, 1, 1; N. Oriole, 4, 4; Brown-headed Cowbird, 2, 2; House Finch, 27, 76; Lesser Goldfinch, 4, 10; Lawrence's Goldfinch, 2, 2; Brewer's Sparrow, 2, 4; White-crowned Sparrow, 7, 8. **Remarks:** Nests found (12): Verdin, 5; Black-throated Sparrow, 3; Cactus Wren, 2; Loggerhead Shrike, 1; House Finch, 1. The study was supported by the U. S. Fish and Wildlife Service, Ecological Services Office, Laguna Niguel and the U. S. Army Corps of Engineers, Los Angeles District.—**RICHARD ZEMBAL and BARBARA W. MASSEY, U. S. Fish and Wildlife Service, 24000 Avila Rd, Laguna Niguel, CA 92677.**

175. PALO VERDE–CHUPAROSA DESERT WASH.—**Location:** California; Riverside Co., E wash of Bear Creek on E flank of Santa Rosa Mountains; SE 1/4 Sec. 13, T6S, R6E, La Quinta Quadrangle, USGS. **Continuity:** New. **Size:** 12.6 ha = 31.1 acres (roughly rectangular, approximately 780 m long; planimetric measurements of 1:13000 aerial photo). **Description of Plot:** Desert woodland occurring along a sandy wash.

There are 130 Palo Verde trees (*Cercidium floridum*) on the plot. The average height and canopy diameter (every fifth tree was measured) were 5.1 m and 8.5 m respectively, with a stem count of 10.3 per ha and canopy cover of 5.8% for the entire plot. Six 2 m wide belt transects, covering a total of 1822 m², were utilized to estimate the composition of perennial plants. Total cover contributed by perennials was 23% with 815 stems per ha. The dominant species were (figures following each species are % cover, stems per ha): Palo Verde 5.3 11; Cheesebush (*Hymenoclea salsola*) 5.1, 258; Chuparosa (*Beloperone californica*) 2.68, 115; Smoketree (*Dalea spinosa*) 1.78, 55; Catclaw (*Acacia greggii*) 1.72, 33; Creosote (*Larrea tridentata*) 1.69, 55; Sweet Bush (*Bebbia juncea*) 1.23, 60; Desert Lavender (*Hyptis emoryi*) 0.88, 16; *Brandegea bigelovii* 0.62, 50 (encounters per ha); Sandpaper Plant (*Petalonyx thurberi*) 0.3, 11; Indigo Bush (*D. schottii*) 0.3, 11; dead perennial 0.84, 148. The shrubs occurred mostly in dense clumps that measured to several meters across. Although there is some evidence of human use, the plot is relatively undisturbed. A dirt road runs the length of the plot and there is minor vehicle travel along the wash bottom. A small area at the N end has been disturbed by the dumping of refuse. **Edge:** The wash continues to the N and S. The flood plain on the W lacks Palo Verde but supports a more widely spaced growth including the other species cited above with dominant Creosote, Cheesebush, Sweet Bush, Brittle Bush (*Encelia farinosa*), and cholla (*Opuntia spp.*). Rocky hills rise abruptly on the E with abundant creosote, *Fagonia levis*, Indigo Bush, *Ambrosia dumosa*, *Aristida adscensionis*, and *Krameria grayi*, with less common Ocotillo (*Fouquieria splendens*) and Barrel Cactus (*Ferocactus acanthodes*). **Water:** Permanent water was present on the N-E margin from a closed storage tank that provides water for the city of La Quinta. A leak in the tank supported a small pool and the tank periodically overflowed, providing abundant but very intermittent water. This overflow has resulted in a dense thicket of vegetation, about 6 × 35 m, along the narrow water course with abundant Palo Verde and other natives but including a few tamarisk (*Tamarix sp.*) trees and Date Palms (*Phoenix dactylifera*). Below the thicket, the influence of increased availability of water is still in evidence from the lushness of growth of the Palo Verde and Beloperone. Additional open water may have been available beginning approximately 100 m N of the plot where the southernmost residences of La Quinta are located. **Food:** Beloperone was in flower during the entire period and was heavily utilized by the hummingbirds. The abundance of blossoms had just begun to decline noticeably by the time of the last visit. **Topography and elevation:** Slopes gradually from 400 ft (122 m) on the S to 300 ft (91 m) on the N. **Weather:** Clear and sunny. Temperatures varied from approximately 49°F in the early morning to 105° by late morning. **Coverage:** Mar. 24-25; Apr. 8-9, 29; June 16; 0523-1045 hrs. Total man-hours: 15. **Census:** Costa's Hummingbird, 17 (135, 55); Verdin, 13 (103, 42); Gambel's Quail, 6 (48, 19); Black-tailed Gnatcatcher, 6; Mourning Dove, 3 (24, 10); House Finch, 3; Black-throated Sparrow, 3;

Bewick's Wren, 2; Cactus Wren, 1; Loggerhead Shrike, 1; Roadrunner, 0.5; Cañon Wren, +; Rock Wren, +; Brown-headed Cowbird, +; Lesser Goldfinch, +; Brewer's Sparrow, +. **Total:** 16 species; 55.5 territorial males or females (441/km², 178/100 acres). **Visitors** (Numbers are maximum observed on any one visit, total observed during all visits): Red-tailed Hawk 1, 1; Gambel's Quail 20, 28; White-winged Dove 2, 2; Mourning Dove 15, 41; Long-eared Owl 1, 1; White-throated Swift 2, 2; Anna's Hummingbird 1, 1; Com. Flicker 1, 1; W. Kingbird 1, 1; Ash-throated Flycatcher 1, 3; *Empidonax* flycatcher 1, 1; Cañon Wren 1, 3; Rock Wren 2, 2; Phainopepla 1, 3; Warbling Vireo 2, 2; Orange-crowned Warbler 7, 21; Nashville Warbler 5, 6; Black-throated Gray Warbler 1, 1; MacGillivray's Warbler 1, 1; Wilson's Warbler 9, 10; House Sparrow 2, 2; Hooded Oriole 1, 1; Scott's Oriole 1, 1; N. Oriole 1, 2; Brown-headed Cowbird 1, 1; Black-headed Grosbeak 3, 6; House Finch 24, 58; Lesser Goldfinch 17, 40; Lawrence's Goldfinch 13, 13; Brewer's Sparrow 1, 2; White-crowned Sparrow 23, 51. **Remarks:** Nests found (8) Verdin, 4; Costa's Hummingbird, 2; Cactus Wren, 1; Black-tailed Gnatcatcher, 1. The study was supported by the U.S. Fish and Wildlife Service, Ecological Services Office, Laguna Niguel and the U.S. Army Corps of Engineers, Los Angeles District.—**RICHARD ZEMBAL, BARBARA W. MASSEY, and GARY P. WHEELER, U.S. Fish and Wildlife Service, 24000 Avila Rd, Laguna Niguel, CA 92677.**

176. PALO VERDE–CHEESEBUSH–CHUPAROSA DESERT WASH.—**Location:** California; Riverside Co., W wash of Bear Creek on E flank of Santa Rosa Mountains, SW ¼ Sec. 13, NW ¼ Sec. 24, NE ¼ Sec. 23, T6S, R6E, La Quinta Quadrangle, USGS. **Continuity:** New. **Size:** 23.5 ha = 58.1 acres (irregular in shape, roughly rectangular and 940 m long; planimetric measurements of 1:13,500 aerial photo). **Description of Plot:** Desert woodland occurs along a sandy wash. There are 389 Palo Verde trees (*Cercidium floridum*) on the plot, 83 of which were mostly lightly to moderately parasitized by Mistletoe (*Phoradendron californicum*). Four 2 m wide belt transects, covering a total of 1,758 m², were utilized to estimate the composition of perennial plants. The total cover contributed by perennials was 24.5% with 1,268 stems per ha. The dominant species were (figures following each species are % cover, stems per ha): Cheesebush (*Hymenoclea salsola*) 5.2, 307; Palo Verde 4.3, 28; Chuparosa (*Beloperone californica*) 2.3, 91; Creosote (*Larrea tridentata*) 2.1, 51; Brittle Bush (*Encelia farinosa*) 1.8, 171; Desert Lavender (*Hyptis emoryi*) 1.6, 46; Smoke Tree (*Dalea spinosa*) 1.3, 51; Pencil Cholla (*Opuntia ramosissima*) 1.0, 91; Catclaw (*Acacia greggii*) 1.0, 17; Sweet Bush (*Bebbia juncea*) 0.7, 57; Allscale (*Atriplex polycarpa*) 0.7, 40; Indigo Bush (*D. schottii*) 0.4, 6, and dead perennials 1.3, 148. Shrubs occurred mostly in dense clumps that measured up to several meters across. Although the wash is heavily used by people, the habitat is relatively undisturbed. A dirt road, comprised mainly of sandy wash bottom, runs the length of the plot. **Edge:** The wash woodland con-

tunes N and S. Along the hills that rise abruptly to the E and W, the vegetation is more widely spaced than in the wash and comprises mostly a mix of elements of the wash woodland and Creosote Bush scrub. Besides sparse contributions by most of the species cited above, dominant plants on the slopes included Creosote, Cheesebush, Sweet Bush, Brittle Bush, cholla (*Opuntia* spp.), *Fagonia laevis*, Indigo Bush, *Ambrosia dumosa*, *Aristida adscensionis*, and *Krameria grayi*, with less common Ocotillo (*Fouquieria splendens*), and Barrel Cactus (*Ferocactus acanthodes*). Water: Open water was present at 2 springs, located approximately 1 km S of the plot. Water was probably also available beginning about 0.3 km N of the plot at the southernmost residences of La Quinta. **Topography and Elevation:** Slopes gradually from 490 ft (149 m) on the S to 390 ft (119 m) on the N. **Weather:** Mostly clear and sunny with light intermittent rain on 1 visit. Temperatures varied from approximately 49°F in the early morning to 105° by late morning. **Coverage:** Mar. 24-25; Apr. 7-8, 28-29; June 16; 0530-1115 hours. Total man-hours: 18.5. **Census:** Verdin, 15 (64, 26); Costa's Hummingbird, 13 (55, 22); Black-throated Sparrow, 11 (47, 19); Phainopepla, 8 (34, 14); Gambel's Quail, 7 (30, 12); Black-tailed Gnatcatcher, 7; Cactus Wren, 5.5 (23, 9), Mourning Dove, 4 (17, 7); Mockingbird, 3.5 (15, 6); Loggerhead Shrike, 3 (13, 5); House Finch, 3; White-winged Dove, 2; Bewick's Wren, 1; Rock Wren, 1; Brewer's Sparrow, 0.5; Roadrunner, +; Scott's Oriole, +. **Total:** 17 species; 84.5 territorial males or females (359/km², 145/100 acres). **Visitors** (numbers are maximum observed during any one visit, total observed during all visits) Red-tailed Hawk, 1; Gambel's Quail 14, 26, White-winged Dove, 6, 12; Mourning Dove, 5, 14; Roadrunner, 2, 2; Lesser Nighthawk, 1, 2; White-throated Swift, 6, 9; Black-chinned Hummingbird, 1, 1; Anna's Hummingbird, 1, 1; W. Kingbird, 1, 2; Ash-throated Flycatcher, 5, 8; Say's Phoebe, 1, 1; Hammond's Flycatcher, 2, 3; Com. Raven, 1, 1, Phainopepla, 6, 10; Warbling Vireo, 3, 5; Orange-crowned Warbler, 4, 8; Nashville Warbler, 4, 5; Yellow Warbler, 3, 5; Yellow-rumped Warbler, 1, 2; Black-throated Gray Warbler, 1, 1; MacGillivray's Warbler, 2, 2; Wilson's Warbler, 4, 7; Hooded Oriole, 1, 1; Scott's Oriole, 3, 5; N. Oriole, 6, 12; Black-headed Grosbeak, 1, 3; House Finch, 15, 38; Lesser Goldfinch, 19, 35; Lawrence's Goldfinch, 10, 15; Brewer's Sparrow, 4, 9; White-crowned Sparrow, 12, 24. **Remarks:** Nests found (27): Costa's Hummingbird, 6; Cactus Wren, 5; Verdin, 4; Mockingbird, 3; Loggerhead Shrike, 3; Black-tailed Gnatcatcher, 2; Phainopepla, 2; Black-throated Sparrow, 2. This study was supported by the U.S. Fish and Wildlife Service, Ecological Services Office, Laguna Niguel and by the U.S. Army Corps of Engineers, Los Angeles District.—RICHARD ZEMBAL, BARBARA W. MASSEY, and GARY P. WHEELER, U.S. Fish and Wildlife Service, 24000 Avila Rd., Laguna Niguel, CA 92677.

177. INLAND COASTAL TUNDRA. — **Location:** Alaska; North Slope Borough, 69 km S of Prudhoe Bay; 69°41'N, 148°42'W,

Sagavanirktok (C-3) Quadrangle, USGS. **Continuity:** Established 1976; 6 consecutive years. **Size:** 100 ha = 247.1 acres. **Description of Plot:** See AB 34: 82 (1980). **Weather:** Mean daily max. temperature for June 13.5°C, mean daily min. temperature for June 2.2°. Snow melt complete by June 9; 5 WSW storms between June 26 and July 10. **Coverage:** May 30-July 10. Total man-hours: 275. **Census:** Lapland Longspur, 40 (40, 16); Am. Golden Plover, 16 (16, 6); Stilt Sandpiper, 12 (12, 5); Pectoral Sandpiper, 8 (8, 3); Willow Ptarmigan, 5 (5, 2); Buff-breasted Sandpiper, 5; Bar-tailed Godwit, 5; redpoll, sp. 5; Semipalmated Sandpiper, 4 (4, 2); N. Phalarope, 4 (resting males); Rock Ptarmigan, 3 (3, 1); Long-tailed Jaeger, 3; Black-bellied Plover, 2; Oldsquaw, 1; Whimbrel, 1; Parasitic Jaeger, 1; Pintail, +; Long-billed Dowitcher, +; Savannah Sparrow, +. **Total:** 19 species; 115 territorial males or females (115/100 ha, 47/100 acres). **Visitors:** Red-throated Loon, Canada Goose, Brant, White-fronted Goose, Mallard, N. Shoveler, Am. Wigeon, Rough-legged Hawk, Golden Eagle, Marsh Hawk, Gyrfalcon, Peregrine Falcon, Baird's Sandpiper, Com. Snipe, Ruddy Turnstone, Pomarine Jaeger, Glaucous Gull, Arctic Tern, Snowy Owl, Short-eared Owl, Tree Swallow, Com. Raven, Yellow Wagtail. **Remarks:** Totals calculated use nesting ♀ Pectoral and Buff-breasted Sandpipers. Calculations based on territorial male Pectoral Sandpipers (5) and lekking Buff-breasted Sandpipers (11) yield 118 territorial males (118/100 ha, 48/100 acres). Overall breeding densities in 1981 were 59% and 57% higher than those in 1979 and 1980, respectively. Eight of the 13 most common breeding species occurred in the highest recorded densities of the 6-year study, and only Buff-breasted Sandpipers nested in densities below the 6-year mean. Most of this increase occurred in 3 species (% increase relative to previous high): Lapland Longspur (up 38%), Am. Golden Plover (up 23%), and Stilt Sandpiper (up 600%). These high breeding densities cannot be explained by hypothesis involving the timing of snow melt, since the date of melt-off in 1981 was intermediate between the 1979 and 1980 dates. The steady increase in nesting density from 1976 to 1981 suggests that bird populations may be reestablishing territories in areas disturbed by energy-related developments of the mid-70's. In fact, some species may respond positively to such disturbances in the long term. For example, 3 of the 4 N. Phalarope nests occurred in areas vegetatively altered by development. Conversely the accumulation of wind-blown dust on the lee side of the Trans-Alaska Pipeline Haul Road has apparently reduced nesting densities in the 15 ha affected by this dust shadow (1 nest/3.75 ha versus 1 nest/2.05 ha in the rest of the plot). Thus, the ambiguous cumulative effect of habitat alteration and recovery indicates that some other factor must account for the increased densities of most species in 1981.

Nesting success was low this year, as only 28% of all nests fledged young. Actual productivity was even lower—only 21% of all eggs laid produced fledged young; 56% of the nests were predated with the Lapland Longspurs and Am. Golden Plovers incurring most of the losses (70% and 83% nest loss, respectively). The inclement weather in

late June and early July accounted for most of the remaining nesting failure. Nests found [off study site included if the male's territory extended into plot; renesting attempts included; (number successfully fledged in parentheses):] 14 species, 79 (22) nests. Lapland Longspur, 33 (5); Am. Golden Plover, 12 (1); Pectoral Sandpiper, 8 (6); Buff-breasted Sandpiper, 5 (1); redpoll, sp. 5 (1), N. Phalarope, 4 (1); Long-tailed Jaeger, 3 (3), Semipalmated Sandpiper, 2 (2); Bar-tailed Godwit, 2 (1); Oldsquaw, 1 (1); Rock Ptarmigan, 1 (1); Black-bellied Plover, 1 (0); Whimbrel, 1 (1); Parasitic Jaeger, 1 (1). This work is part of a long-term ecological study of the impact of North Slope petroleum resource development funded through US DOE contract DE-AC06-76RLO-1830.—BRIAN J. McCAFFERY, ROBERTO BURGESS, and WAYNE C. HANSON, Ecological Sciences Dept., Battelle, Pacific Northwest Laboratory, Richland, WA 99352.

178. WET COASTAL PLAIN TUNDRA.

— **Location:** Alaska; North Slope Borough, 13.8 km (8.6 mi) SSW of Deadhorse; 70°5'N, 148°30'W; Beechey Point Quadrangle (A-3) USGS. **Continuity:** Established 1979; 3 consecutive years. **Size:** 110 ha = 271.8 acres (approximately rectangular in shape with a recently added 300 m × 900 m (27 ha) strip in the NE corner of the study site resulting in a site 10 ha larger than last year. The shape and size of the study site were altered for the purposes of evaluating breeding densities prior to the proposed construction of the ALCAN natural gas pipeline. The site is surveyed and gridded at 50 m intervals). **Description of Plot:** See AB 34: 83-4 (1979). With the recent changes in size and shape of the plot there are slight changes in percent composition of vegetation types; the new percentages are as follows: Type 2 = 4%; Type 3 = 30%; Type 4 = 46%; Type 5 = 16%; and Type 13 = 4%. **Weather:** Mean temperature and wind velocity for late May and June respectively; 3.6°C, and 10 mph. Mean temperature and wind velocity for July respectively; 7.7°, and 10 mph. Late May and early June was predominantly overcast with snow flurries and temperatures near 0°. The weather was mostly clear through the remainder of the month with NE winds (strong at times), except near the end of the month when we encountered a few storms out of the SW. In July the pattern of frontal systems out of the SW continued off and on into the latter part of the month. Percent snow cover as follows May 28, 100%; June 1, 80%; June 5, 69%, June 10, 22%; June 15, 6% (concentrated around and above ground pipeline and pads), June 20, 0%. The snow phenology was approximately 5 days earlier than 1980. Percent water cover as follows: May 28, 0%, June 1, 7%; June 5, 13%; June 10, 52% (peak); June 15, 45%; June 20, 32%. The water cover declined to a low of 23%, but then fluctuated periodically with numerous rain storms in late June and July. **Coverage:** May 28-June 26; = 0800-1700 in May and June; = 0800-1200 in July. Total man-hours 776. **Census:** Lapland Longspur, 53 (48, 19), Pectoral Sandpiper, 24 (22, 9); Semipalmated Sandpiper, 22 (20, 8); N. Phalarope, 17 (15, 6); Red Phalarope, 6 (5, 2); Dunlin, 5 (5, 2), Stilt Sandpiper, 4 (4, 1); Arctic Loon, 3, (3,

1); Oldsquaw, 3; Willow Ptarmigan, 3; Long-billed Dowitcher, 3; Am. Golden Plover, 2; White-fronted Goose, 1; Pintail, 1; King Eider, 1; Baird's Sandpiper, 1; Long-tailed Jaeger, 1; Savannah Sparrow, 1; Snow Bunting, 1. **Total:** 19 species; 152 territorial males or females (138/km²; 56/100 acres). **Visitors:** Yellow-billed Loon, Red-throated Loon, Whistling Swan, Canada Goose, Brant (both *brenicla* and *nigricans*), Snow Goose, Mallard, Green-winged Teal, N. Shoveler, Am. Wigeon, Greater Scaup, Spectacled Eider, Rough-legged Hawk, Golden Eagle, Marsh Hawk, Gyrfalcon, Peregrine Falcon, Rock Ptarmigan, Sandhill Crane, Semipalmated Plover, Black-bellied Plover, Bar-tailed Godwit, Whimbrel, Ruddy Turnstone, Com. Snipe, Sanderling, Buff-breasted Sandpiper, Pomarine Jaeger, Parasitic Jaeger, Glaucous Gull, Slaty-backed Gull, Sabine's Gull, Arctic Tern, Snowy Owl, Short-eared Owl, Bank Swallow, Com. Raven, Yellow Wagtail, redpoll sp. **Remarks:** Total ♂ Pectoral Sandpipers defending territories was 23; thus the total breeding density changes to 151 territorial males (137/100 km², 56/100 acres) if calculations are based on males instead of females. The number of breeding/territorial species increased by 5 over 1980 total. The increase involved the addition of 7 species; Pintail, Oldsquaw, King Eider, Baird's Sandpiper, Long-tailed Jaeger, Savannah Sparrow, Snow Bunting; and the absence of redpoll and Com. Snipe. The breeding of the Long-tailed Jaegers in the area was probably the result of high Brown and Collared Lemming populations. In past field seasons, Lemmings were virtually absent; however, in 1981 Lemmings were regularly observed. The high Snowy Owl population also supports this premise. The total breeding density declined 8% from 1980. Four species accounted for 75% of the total breeding densities: Lapland Longspur 34%; Pectoral Sandpiper 16%; Semipalmated Sandpiper 16%; and N. Phalarope 11%. Compared to the 1980 breeding densities of the above 4 species, Lapland Longspurs were +9%; Pectoral Sandpiper -68%; Semipalmated Sandpiper -80%; and N. Phalarope +50%. In the 3 years of study at the site, Lapland Longspurs and N. Phalaropes were at their highest breeding densities, Pectoral Sandpipers and Semipalmated Sandpipers at their lowest. Northern Phalaropes have increased sharply in the 3 years (+300%). The first full clutch of a Lapland Longspur (earliest breeding bird) in 1979 was June 6; 1980, June 12; and in 1981, June 4. The first full clutch in 1981 was 2 days earlier than in 1979 even though the snow phenology in 1981 was approximately 14 days behind that of 1979. The explanation for this phenomenon is in the pattern of snow melt in 1981, which began just after May 27, and then proceeded very slowly with the persistent cloud cover and cold days. Coupled with the slow snow melt pattern, high water cover prolonged initiation of egg laying. The result was an extremely protracted breeding season with little synchrony in hatching dates. There seems to be a cumulative effect taking place in regards to the impoundment of water on the W side of the plot. Over the past 3 years, the distribution of nests have progressively occurred farther to the W away from the flooded habitat. Only some of the later nesting

species, such as N. Phalaropes, and the "late wave" of ♀ Pectoral Sandpipers can take advantage of the habitat close to the pipeline and pad. In terms of nesting densities (nests/ha), the E (upwind) side had a 28% higher nesting density than that of the W (downwind) side in 1981. Of the 147 nests found on the plot 54 (37%) successfully fledged young. The dramatic decline in success rate for the season was primarily the result of Arctic Foxes. A ♀ Arctic Fox was almost daily observed either hunting or traveling across the plot. The success rate in 1979 and 1981 was 35% and 37% respectively, and in both years foxes hunted the plot. In 1980, foxes were rarely observed and success rate was 70%. Nests located (numbers hatched successfully in parentheses): Lapland Longspur 47 (9), 11 renests (2); Pectoral Sandpiper 24 (8); Semipalmated Sandpiper 22 (11), 2 renests (1); N. Phalarope 17 (12); Red Phalarope 6 (5); Arctic Loon 3 (0), 1 renest (1); Dunlin 3 (1); Am. Golden Plover 2 (0); White-fronted Goose 1 (1); Pintail 1 (0); King Eider 1 (0); Long-billed Dowitcher 1 (0); Baird's Sandpiper 1 (1); Stilt Sandpiper 1 (1); Long-tailed Jaeger 1 (0); Savannah Sparrow 1 (1); Snow Bunting 1 (0). This work is part of a long-term ecological study on the impact of the North Slope petroleum resource developments funded through the US DOE Contract DE-AC06-76RLO 1830.—*CRAIG J. HOHENBERGER, DAVID P. RUDHOLM, and WAYNE C. HANSON, Ecological Sciences Dept., Battelle, Pacific Northwest Laboratory, Richland, WA 99352.*

179. ASPEN FOREST. — **Location:** Manitoba; Morton Municipality; near Bois-Sevain, 322 m E of Hwy 446 along the N boundary of Turtle Mountain Prov. Park; Sect. 31, Rge. 20, T.1; 49°05'N, 100°08'W, Deloraine 62F/1. **Continuity:** Established 1977; 5 consecutive years. **Size:** 16 ha = 39.2 acres. **Description of Plot:** See AB 33: 96-97 (1979). **Weather:** Temperatures slightly below normal for June. Precipitation low till early June, then normal. **Coverage:** May 30; June 3, 9, 11, 20, 24, 26; July 3; 0545-0845, CDT. Total man-hours: 22. **Census:** Red-eyed Vireo, 12.5 (79, 32); Least Flycatcher, 7.5 (47, 19); Ovenbird, 6.5 (41, 17); Veery, 4.5 (28, 11); Am. Redstart, 3.5 (22, 9); Com. Yellowthroat, 3 (19, 8); Great Crested Flycatcher, 2; White-throated Sparrow, 2; Ruffed Grouse, 1.5; Am. Robin, 1; Mourning Warbler, 1; Brown-headed Cowbird, 1; House Wren, 0.5; Rose-breasted Grosbeak, 0.5; Warbling Viero, +; N. Waterthrush, +. **Total:** 16 species; 47 territorial males or females (296/km²; 120/100 acres). **Visitors:** Sora, Mourning Dove, Ruby-throated Hummingbird, Yellow-bellied Sapsucker, Hairy Woodpecker, E. Kingbird, Blue Jay, Black-capped Chickadee, White-breasted Nuthatch, Cedar Waxwing, Red-winged Blackbird, N. Oriole, Com. Grackle, Chipping Sparrow, Song Sparrow. **Remarks:** Nests located: Veery, 1; Ovenbird, 1. Red-eyed Vireo territories occupied most of the plot. Ovenbirds occurred where Red-eyed Vireos were not found. Undoubtedly this is related to the apparent preference of Ovenbirds for sites with sparse shrubbery while the Red-eyed Vireo requires substantial shrub cover.

Least Flycatchers, as usual, were concentrated in the NW corner, but in contrast to former years they did not occur in the NE, SE, or NW central regions. This is probably related to a slight decrease in abundance of this species. Red-eyed Vireos and Am. Redstarts continuously increased in abundance throughout the count period and were still noted moving on to territories after mid-June.—*KEN DE SMET, Manitoba Dept. of Natural Resources, 1495 St. James St., Winnipeg, Manitoba, Canada R3H OW9.*

180. LOW ARCTIC TUNDRA. — **Location:** Manitoba; Churchill, about 2 km S of the main terminal building at the Churchill airport; 58°45'N, 94°13'W, Churchill, Manitoba (1: 250,000) topographic map. **Continuity:** New. **Size:** 16.16 ha = 39.9 acres (square, 402 × 402 m, paced). **Description of Plot:** Low, wet tundra dominated by various sedges including *Scirpus cespitosus*, and numerous raised areas, composed of reindeer lichens (*Cladonia* sp.). Predominant woody vegetation included Dwarf Birch (*Betula glandulosa*), Lapland Rosebay (*Rhododendron lapponicum*) and a prostrate willow (*Salix reticulata*). Three small Black Spruce (*Picea mariana*) grew near the E and S borders. Time did not permit a quantitative analysis of the vegetation. **Edge:** Bounded on the W, S and E by similar habitat, and on the N by an infrequently used gravel road. **Topography:** Flat; 4 small (<0.5 ha) tundra ponds held water. **Elevation:** 45 ft (13.7 m). **Weather:** During June, the mean temperature was +6.6°C (+0.5°C above normal), and in July 13.4° (+1.4° above normal). Precipitation totaled 18.2 mm in June and 64.5 mm in July. These figures deviated -21.8 mm and +15.2 mm from normal. The tundra was snow free for 24 days in June and throughout July. The Churchill River was ice-free on June 11. **Coverage:** July 7-11; 0400-0630 and 1700-2300. Total man-hours: 7.7. **Census:** Savannah Sparrow, 4 (25, 10); Am. Golden Plover, 2.5; Whimbrel, 2; Dunlin, 2; Smith's Longspur, 2; Hudsonian Godwit, 1.5; Stilt



Breeding Bird Census 180, Low Arctic Tundra, Churchill, Manitoba. Photo/ Craig A. Faanes.

Sandpiper, 1; Least Sandpiper, 1; Parasitic Jaeger, 0.5; Tree Sparrow, +. **Total:** 10 species; 16.5 territorial males ($102/\text{km}^2$, $41/100 \text{ acres}$). **Visitors:** Canada Goose, Willow Ptarmigan, Long-tailed Jaeger, Arctic Tern, Short-eared Owl, Sprague's Pipit, White-crowned Sparrow. **Remarks:** Nest found: Dunlin, 2. The Sprague's Pipit represented the first record for this species at Churchill and for Northern Manitoba.—**CRAIG A. FAANES, U.S. Fish and Wildlife Service, Northern Prairie Wildlife Research Center, Jamestown, ND 58401.**

181. SHRUBBY SWAMP AND SEDGE HUMMMOCKS. — **Location:** Connecticut; Litchfield Co., N end of Bantam Lake, White Memorial Foundation, Litchfield; $41^\circ 43' 02''\text{N}$, $73^\circ 12' 27''\text{W}$, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 15 intermittent years. **Size:** $8.09 \text{ ha} = 20 \text{ acres}$. **Description of Plot:** See AFN 19: 625-627 (1965). **Coverage:** June 4-6, 9. Total man-hours: 14. **Census:** Swamp Sparrow, 48 (593, 240); Red-winged Blackbird, 38 (469, 190); Yellow Warbler, 24 (297, 120); Virginia Rail, 14 (173, 70); Com. Yellowthroat, 12 (148, 60); Willow Flycatcher, 10 (124, 50); Song Sparrow, 10; Gray Catbird, 5 (62, 25); Am. Goldfinch, 5; Mallard, 4 (49, 20); Cedar Waxwing, 4; E. Kingbird, 3 (37, 15); Long-billed Marsh Wren, 3; Wood Duck, 2; Black-billed Cuckoo, 2; Alder Flycatcher, 2; Brown-headed Cowbird, 2; Canada Goose, 1; Black Duck, 1; Tree Swallow, 1; Black-capped Chickadee, 1; Chestnut-sided Warbler, 1; Yellow-billed Cuckoo, 0.5; Com. Flicker, 0.5; Great Crested Flycatcher, 0.5; Yellow-

throated Vireo, 0.5; N. Oriole, 0.5; Rose-breasted Grosbeak, 0.5; Great Blue Heron, +; Broad-winged Hawk, +; Barred Owl, +; Ruby-throated Hummingbird, +; Am. Redstart, +; Cardinal, +. **Total:** 34 species; 196 territorial males ($2422/\text{km}^2$, $980/100 \text{ acres}$). **Remarks:** A little higher density than normal. Water level was normal. Nearby hardwood infestation of gypsy moth caterpillars was significant, perhaps causing increased alternate feeding in Buttonbush and willow by songbirds.—**ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.**

182. CAT-TAIL-BULRUSH SWAMP. — **Location:** New Jersey; Morris Co., 1 mi E of Basking Ridge, Great Swamp Nat'l Wildlife Refuge; Waterfowl Management Unit No. 2. $40^\circ 41' \text{N}$, $74^\circ 32' \text{W}$, Bernardsville Quadrangle, USGS. **Continuity:** Established 1980. **Size:** $5.87 \text{ ha} = 14.5 \text{ acres}$. **Description of Plot:** See AB 35: 98 (1981). **Weather:** Average temperature for May was 64°F ($28-86^\circ$). Total rainfall was 4.66 in. Average temperature for June was 67° ($41-86^\circ$). Total rainfall was 3.89 in. **Coverage:** May 15, 19, 22, 29; June 1, 5, 10, 19; 0530-0800 hours. Total man-hours: 16. **Census:** Long-billed Marsh Wren, 21 (358, 145); Swamp Sparrow, 8 (136, 55); Red-winged Blackbird, 5.5 (94, 38); Com. Yellowthroat, 2. **Total:** 4 species; 36.5 territorial males ($622/\text{km}^2$, $252/100 \text{ acres}$). **Visitors:** Great Blue Heron, Green Heron, Least Bittern, Canada Goose, Mallard, Wood Duck, Virginia Rail, Chimney Swift, Willow Flycatcher, Tree Swallow, Barn Swallow, Blue Jay, Com. Crow, Yellow Warbler, Bobolink, Com. Grackle.—**HAROLD P. LAS-KOWSKI, Great Swamp Nat'l Wildlife Ref-**

uge, USDI, Fish and Wildlife Service, R.D. #1 Box 152, Basking Ridge, NJ 07920.

183. FRESHWATER BULRUSH MARSH WITH SCATTERED TREES. — **Location:** New Jersey; Morris Co., 1 mi E of Basking Ridge, Great Swamp Nat'l Wildlife Refuge, Waterfowl Management Unit No. 3A $40^\circ 41' \text{N}$, $74^\circ 32' \text{W}$, Bernardsville Quadrangle, USGS. **Continuity:** Established 1980. **Size:** $5.02 \text{ ha} = 12.4 \text{ acres}$. **Description of Plot:** See AB 35: 97 (1981). **Weather:** Average temperature for May was 64°F ($28-86^\circ$). Total rainfall was 4.66 in. Average temperature for June was 67° ($41-86^\circ$). Total rainfall was 3.89 in. **Coverage:** May 22, 29; June 1, 3, 5, 8, 10, 12; 0500-0630. Total man-hours: 12. **Census:** Swamp Sparrow, 12 (239, 97); Red-winged Blackbird, 9 (179, 73); Yellow Warbler, 7 (139, 56); Com. Yellowthroat, 5 (100, 40); Willow Flycatcher, 2.5; Long-billed Marsh Wren, 2; E. Kingbird, 1. **Total:** 7 species, 38.5 territorial males ($767/\text{km}^2$, $310/100 \text{ acres}$). **Visitors:** Mallard, Wood Duck, Canada Goose, Great Blue Heron, Green Heron, Virginia Rail, Mourning Dove, Yellow-billed Cuckoo, Starling, Com. Grackle, Am. Goldfinch, Song Sparrow. **Remarks:** Nests found: Red-winged Blackbird (1), Long-billed Marsh Wren (1).—**THEODORE W. GUTZKE, Great Swamp Nat'l Wildlife Refuge, U.S.D.I., Fish and Wildlife Service, R.D. #1, Box 152, Basking Ridge, NJ 07920**

184. CAT-TAIL MARSH. — **Location:** New York; St. Lawrence Co., 2 mi NW of Canton, NE end of Upper and Lower Lakes Wildlife Mgt. Area; 1 mi SW of Rte 68, $44^\circ 37' \text{N}$, $75^\circ 14' \text{W}$ Canton Quadrangle, USGS. **Continuity:** Established 1978; 3 intermittent years. **Size:** $9.7 \text{ ha} = 24 \text{ acres}$. **Description of Plot:** See AB 33: 103 (1979) and 35: 35 (1981); 7 acres alder edge added to marsh this year. **Weather:** See Census 7 **Coverage:** Apr. 28, 30; May 5-8, 18-19, 23, 27, 29; June 5, 26; 0630-1900, EST. Total man-hours: 7. **Census:** Red-winged Blackbird, 23 (237, 96); Long-billed Marsh Wren, 7 (72, 29); Yellow Warbler, 5.5 (57, 23); Com. Gallinule, 5 (51, 21); Blue-winged Teal, 3.5 (36, 15); Swamp Sparrow, 2; Song Sparrow, 2; Pied-billed Grebe, 1.5; Am. Bittern, 1.5; Am. Coot, 1.5; E. Kingbird, 1.5; Alder Flycatcher, 1.5; Gray Catbird, 1.5; Com. Yellowthroat, 1.5; Canada Goose, 1; Mallard, 1; Black Duck, 1; Killdeer, 1; Com. Snipe, 1; Ring-necked Duck, 0.5; Black Tern, 0.5. **Total:** 21 species; 64.5 territorial males ($664/\text{km}^2$, $269/100 \text{ acres}$). **Visitors:** Tree Swallow, Barn Swallow, Com. Crow. **Remarks:** Observed Pied-billed Grebe, Canada Goose, Black Duck, Com. Gallinule and Am. Coot with young; Song Sparrow nest.—**KENNETH L. CROWELL, Dept. of Biol., St. Lawrence Univ., Canton, NY 13617.**

185. CAT-TAIL MARSH. — **Location:** Ontario; Haldimand-Norfolk Regional Municipality, Port Rowan, 0.2 mi NE of Long Point Prov. Park; $42^\circ 35' \text{N}$, $80^\circ 22' \text{W}$, Big Rice Bay, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** New. **Size:** $7.5 \text{ ha} = 18.5 \text{ acres}$ (square, surveyed). **Description of Plot:** Narrow-leaved Cat-tail (*Typha angustifolia*) accounted for 100% of the emergent vegetation. Water depths ranged from 58-96 cm and

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averaged 74 cm. Percentage open water cover (small pools) was estimated at 35%. **Edge:** Surrounded by open water and similar habitat. **Topography:** Flat. **Elevation:** 573 ft. **Weather:** Generally warm (70-85°F) and sunny with light winds. **Coverage:** May 18, 21, 31; June 5, 15, 28; July 1, 6; 0700-1200, EST. Total man-hours: 27. **Census:** Red-winged Blackbird, 139 (1857, 751); Com. Grackle, 51 (681, 276); Long-billed Marsh Wren, 24 (321, 130); Black Tern, 14 (187, 76); Com. Gallinule, 4 (53, 22); Pied-billed Grebe, 3 (40, 16); Mallard, 3; Am. Bittern, 2; Least Bittern, 1. **Total:** 9 species; 241 territorial males or females ($3219/\text{km}^2$, 1303/100 acres). **Visitors:** Great Blue Heron and Black-crowned Night Heron. **Remarks:** Nests found (237): Red-winged Blackbird, 139; Com. Grackle, 51; Long-billed Marsh Wren, 24; Black Tern, 14; Pied-billed Grebe, 3; Mallard, 3; Am. Bittern, 2; Least Bittern, 1; Com. Gallinule, 1. Of special note was the large number of nesting grackles. This study was funded by a Canadian Wildlife Service contract. Special thanks to John Haggeman for his field assistance.—*JON D. McCACKEN, Long Point Bird Observatory, Port Rowan, Ontario, Canada NOE 1MO.*

186. CORDGRASS SALT MARSH I. —

Location: Florida, Brevard Co., NW of I-95 and State Rd 50 intersection; $28^\circ 34' \text{N}$, $84^\circ 53' \text{W}$, Titusville SW Quadrangle, USGS. **Continuity:** New. **Size:** 25 ha = 61.8 acres (square, surveyed). **Description of Plot:** The plot is irregularly flooded by rainfall events and regularly flooded by cyclic changes of the St. Johns River. Ground water salt con-

centration ranges from 2 to 20 parts per thousand depending on level of flooding. Soils range from sand to muck, frequently with sandy surface soils high in organic matter and clay subsoils within 0.1 m. Vegetation cover was determined from sampling 317 plots. Primary vascular plant species in order of importance (% frequency of occurrence) were: Cordgrass (*Spartina bakerii*), 94; *Fimbristylis castanea*, 33; Needle Rush (*Juncus roemerianus*), 16; Morning Glory (*Ipomoea sagittata*), 13; Sawgrass (*Cladium jamaicensis*), 13; Salt Grass (*Distichlis spicata*), 8; Leavenworth Goldenrod (*Solidago leavenworthii*), 8. **Edge:** Bordered on all sides by similar habitat. **Topography:** Flat. **Elevation:** 3.7 m. **Weather:** Hot and humid but lacking normal rainfall, $10-32^\circ \text{C}$. **Coverage:** Apr. 22, 28; May 12, 14, 20; June 17, 22; July 3; 0530-0730, 0900-1000, and 1800-2000, EDT. Total man-hours: 16. **Census:** Red-winged Blackbird, 23 (92, 37); E. Meadowlark, 4 (16, 6); King Rail, 3 (12, 5); Com. Nighthawk, 2 (females). **Total:** 4 species; 32 territorial males or females ($120/\text{km}^2$; 48/100 acres). **Visitors:** Black Rail, Com. Yellowthroat. **Remarks:** Nests located: Com. Nighthawk, 2; Red-winged Blackbird, 2.—*WILLARD P. LEENHOUTS, St. Johns Nat'l Wildlife Refuge, P.O. Box 6504, Titusville, FL 32780.*

187. CORDGRASS SALT MARSH II. —

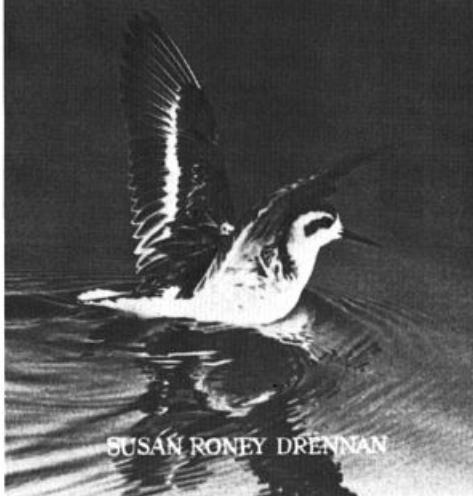
Location: Florida, Brevard Co., E of State Rd 407 and State Rd 528 intersection; $28^\circ 28' \text{N}$, $80^\circ 51' \text{W}$, Sharpes Quadrangle, USGS. **Continuity:** New. **Size:** 25 ha = 61.8 acres (square, surveyed). **Description of Plot:** Irregularly flooded by rainfall during the

summer rainfall season. Little flooding occurs from the St. Johns River due to highway construction. Ground water salt concentration averages 6-8 parts per thousand. Soils range from sand to muck, frequently with sandy surface soils high in organic matter and clay subsoils within 0.1 m. Vegetation was determined from sampling 90 plots. Primary vascular plant species in order of importance (% frequency of occurrence) were: Cordgrass (*Spartina bakerii*), 97; Climbing Hempweed (*Mikania scandens*), 43; Morning Glory (*Ipomoea sagittata*), 37; Knotroot Bristlegrass (*Setaria geniculata*), 34; Eryngio (*Eryngium baldwinii*), 28; Pluchea rosea, 27, Sea-purslane (*Sesuvium portulacastrum*), 23; *Fimbristylis castanea*, 20+; Pinehill Beakrush (*Rhynchospora globularis*), 20, Carphephorus odoratissimus, 20; Gulf Hairawn Muhy (*Muhlenbergia capillaris*), 16; Sea Myrtle (*Baccharis halimifolia*), 16, Star Rush (*Dichromena colorata*), 16; Panic Grass (*Panium boscii*), 12; False Willow (*Baccharis angustifolia*), 10. **Edge:** Bordered on all sides by similar habitat. **Topography:** Flat. **Elevation:** 3.7 m. **Weather:** Hot and humid but lacking normal rainfall; $10-32^\circ \text{C}$. **Coverage:** Apr. 23, 27; May 11, 13, 19; June 17, 23; July 9; 0530-0730, 0900-1100 and 1800-2000, EDT. Total man-hours: 16. **Census:** Red-winged Blackbird, 24 (96, 39); King Rail, 5 (20, 8); Black Rail, 5; Com. Yellowthroat, 4 (16, 6); E. Meadowlark, 3 (12, 5), Rufous-sided Towhee, 0.5. **Total:** 6 species, 41.5 territorial males ($164/\text{km}^2$; 66/100 acres). **Visitors:** Bobwhite. **Remarks:** Nests located: Red-winged Blackbird; 3. Little Blue Heron, Green Heron, and White Ibis

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were seen feeding on the plot following flooding.—*WILLARD P. LEENHOUTS, St. Johns Nat'l Wildlife Refuge, P.O. Box 6504, Titusville, FL 32780.*

188. GULF COAST SALT MARSH.—**Location:** Florida; Levy Co., 6 km NW of Cedar Key.; a marsh bounded on SW by Prodie Creek, on the S by Live Oak Key and the Gulf of Mexico (Waccasassa Bay) and on the NE by Dorset Creek; 29°11'N, 83°00'W, Sumner Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 31 ha = 76.6 acres (increase from previous 15 ha). **Description of Plot:** See AB 35: 99, 104 (1980). **Weather:** Mostly clear days, 50°-91°F. No census taken when wind was over 10 km/h. **Coverage:** Feb. 28; Mar. 7, 21, 28; Apr. 2, 4, 9, 11-12, 15-16, 18-19, 22, 24, 25-26, 29-30; May 2-3, 7, 10, 13-14, 17, 20-21, 24, 27-28, 30-31; June 13, 20, 25, 27; July 2, 9, 16, 25. Total man-hours: 168. **Census:** Seaside Sparrow, 49 (158, 64); Clapper Rail, 16 (52, 21); Long-billed Marsh Wren, 1. **Total:** 3 species; 66 territorial males (213/km², 86/100 acres). **Visitors:** White Pelican, Brown Pelican, Double-crested Cormorant, Great Blue Heron, Green Heron, Little Blue Heron, Cattle Egret, Great Egret, Snowy Egret, Yellow-crowned Night Heron, White Ibis, Turkey Vulture, Marsh Hawk, Osprey, Virginia Rail, Willet, Greater Yellowlegs, Lesser Yellowlegs, Least Sandpiper, Dunlin, Short-billed Dowitcher, Ring-billed Gull, Laughing Gull, Forster's Tern, Royal Tern, Belted Kingfisher, Fish Crow, Red-winged Blackbird, Sharp-tailed Sparrow. **Remarks:** The survey area was expanded this year from 15

to 31 ha. The new area contains less optimal nesting sites, hence the decrease in Seaside Sparrow density from last year. Most of the Seaside Sparrow males were mated. Nests of Seaside Sparrows were found and tape recordings made of all individual color-marked males counted in this survey. As last year, the single Long-billed Marsh Wren was unmated. No major floods occurred this year.—*MARY VICTORIA McDONALD, Dept. of Zoology, Univ. of Florida, Gainesville, FL 32611.*

BREEDING BIRD CENSUSES IN THE RED LAKE PEATLANDS OF NORTHERN MINNESOTA

The following 5 censuses were conducted in the Red Lake peatlands, an 800 km² bog located N of Upper Red Lake in NW Minnesota. These censuses are designed to assess the impact of a 500 kilovolt transmission line on the bird populations in the major habitat types within the peatlands. The censuses reported are the "control" plots for this study (see AB 35: 99-100 (1980)).

Each plot was censused 8 times during the breeding season (May 23-July 10) between 0445 and 0955, CDT (most 0500-0830). The census rate was approximately 17 m/min, except in the open fen where it was 20 m/min. Censuses of each plot were rotated among 3 observers. Two census routes were alternately used in each plot so that each line in a 50 × 50 m grid system was walked every other census. Census routes were, thus, 100 m apart. Censuses were conducted on

mornings with winds less than 24 km/h and with no precipitation. Temperatures: 37°-72°F.

Although no censuses were conducted with precipitation, rainfall for June was 7 mm above average. Precipitation was recorded on 26 of 30 days in June which caused the water levels in the peatlands to be approximately 0.25 m higher than normal. Since the 1980 breeding season occurred in a dry year (precipitation 4.15 mm below the average) a comparison between 1980 and 1981 represents a wide variation in precipitation and this presumably had an impact on bird species composition and density.

Thanks to Farron Wallace who helped conduct the censuses. Funding for the project was provided by Northern States Power Company, Minneapolis, Minnesota.—*JOANN HANOWSKI, MARY BETH NEVERS, and GERALD J. NIEMI, Dept. of Biological Sciences, Fl. State Univ., Tallahassee, FL 32306.*

189. CLOSED BLACK SPRUCE BOG.—

Location: Minnesota; Koochiching Co., 22.4 km NE of Waskish, W of Pine Island Trail; 48°16'06"N, 94°23'16"W, Wayland SW Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 17.5 ha = 43.24 acres. **Description of Plot:** See AB 35: 100 (1980). **Weather:** See introduction. **Coverage:** May 23, 28, 31; June 9, 13, 25, 27; July 9; 0500-0900, CDT. Total man-hours: 17. **Census:** Nashville Warbler, 10 (57, 23); Palm Warbler, 10; Connecticut Warbler, 10; Yellow-rumped Warbler, 5 (29, 12); Dark-eyed Junco, 4 (23, 9); Yellow-bellied Flycatcher, 3 (17, 7); Hermit Thrush, 3; Chipping Sparrow, 2; Golden-crowned Kinglet, 1; Gray Jay, 1; Blue Jay, +; Boreal Chickadee, +. **Total:** 12 species; 49 territorial males or females (280/km², 113/100 acres). **Visitors:** E. Kingbird, Olive-sided Flycatcher, Red-breasted Nuthatch, Brown-headed Cowbird. **Remarks:** Nests found Nashville Warbler, 1; Palm Warbler, 1 (cowbird parasitized). The species composition was nearly identical to 1980. The Golden-crowned Kinglet was new while the White-throated Sparrow was absent. The densities of most species were similar to 1980 with the exception of the Palm and Nashville warblers which showed slight increases and the Connecticut Warbler which doubled its population. The population showed an overall increase of 32% from 1980.

190. OPEN BLACK SPRUCE BOG.—

Location: Minnesota; Lake of the Woods Co., 1.6 km NE of Beltrami and Lake of the Woods Co. line on Minn. Hwy 72; 48°23'05"N, 94°33'21"W, Chase Brook NE Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 5 ha = 12.36 acres. **Description of Plot:** see AB 35: 100 (1980). **Weather:** See introduction. **Coverage:** May 25, 29; June 4, 12, 15, 29; July 1, 8; 0445-0950, CDT. Total man-hours: 6.8. **Census:** Savannah Sparrow, 7 (140, 57); Lincoln's Sparrow, 4 (80, 32); E. Kingbird, 1; Nashville Warbler, 1; Palm Warbler, 1; Clay-colored Sparrow, 1; Yellow-bellied Flycatcher, +; Yellow-rumped Warbler, +. **Total:** 8 species; 15 territorial males or females (300/km², 121/100 acres). **Visitors:** Sharp-tailed Grouse, Tree Swallow, Cedar Waxwing, Yellow Warbler, Brown-headed Cowbird, White-throated Sparrow.

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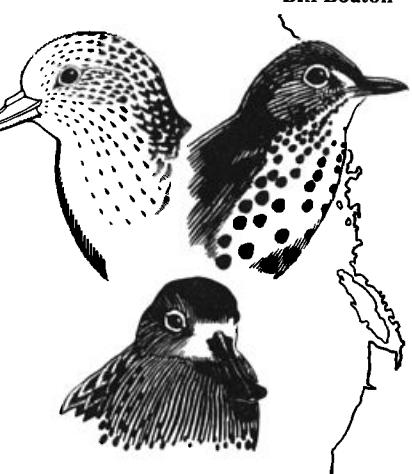
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Remarks: The species composition was nearly the same as the 1980 census. Yellow-bellied Flycatcher and Yellow-rumped Warbler were new and the Bobolink was not present this year. The Savannah Sparrow population showed an increase of 25% over 1980 and the overall population increased 15%.

191. SHRUB SWAMP. — **Location:** Minnesota; Lake of the Woods Co., 3.2 km SW from the junction of Minn. Hwy 72 and County Rd 77; 48°24'19"N, 94°35'51"W, Chase Brook NE Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 12.5 ha = 30.9 acres. **Description of Plot:** See AB 35: 100 (1980). **Weather:** See introduction. **Coverage:** May 26, 30; June 4, 11, 15, 24; July 1, 7; 0515-0845, CDT. Total man-hours: 13.5. **Census:** Short-billed Marsh Wren, 24 (192, 78); Swamp Sparrow, 21 (168, 68); Com. Yellowthroat, 20 (160, 65); Le Conte's Sparrow, 13 (104, 42); Alder Flycatcher, 6 (48, 19); Bobolink, 4 (32, 13); Yellow Warbler, 4; Clay-colored Sparrow, 3 (24, 10); Brown-headed Cowbird, 3; Am. Bittern, 1; Com. Snipe, 1; Black-capped Chickadee, 1; Nashville Warbler, 1. **Total:** 13 species; 102 territorial males or females (816/km²; 330/100 acres). **Visitors:** Marsh Hawk, E. Kingbird, Tree Swallow, Blue Jay, Red-winged Blackbird, Am. Goldfinch. **Remarks:** The species composition changed slightly from 1980. No Yellow Rails or Short-eared Owls were recorded this year. Species new this year were the Nashville Warbler, Black-capped Chickadee, and Brown-headed Cowbird. Although the overall population showed a slight increase (2%) there were some significant population differences on the species level between the 2 years. The following species showed a decrease: Short-billed Marsh Wren (33%), Yellow Warbler (33%), Bobolink (20%), and Swamp Sparrow (5%). The following species increased from 1980: Alder Flycatcher (500%), Le Conte's Sparrow (44%), Clay-colored Sparrow (50%), and Com. Yellowthroat (11%).

192. OPEN BOG. — **Location:** Minnesota; Lake of the Woods Co., 2.4 km NE of Beltrami-Lake of the Woods Co. line on Minn. Hwy 72; 48°21'36"N, 94°32'00"W; Ludlow Lookout Tower Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 10 ha = 24.7 acres. **Description of Plot:** See AB 35: 100 (1980). **Weather:** See introduction. **Coverage:** May 25, 29; June 10, 12, 14, 28, 30; July 8; 0520-0950, CDT. Total man-hours: 8.4. **Census:** Short-billed Marsh Wren, 24 (240, 97); Le Conte's Sparrow, 14 (140, 57); Com. Yellowthroat, 13 (130, 53); Swamp Sparrow, 10 (100, 40); Clay-colored Sparrow, 9 (90, 36); Bobolink, 5 (50, 20). **Total:** 6 species; 75 territorial males or females (750/km²; 304/100 acres). **Visitors:** Marsh Hawk, Sharp-tailed Grouse, Short-eared Owl, Tree Swallow. **Remarks:** The only changes in the species composition from 1980 were the absence of the Short-eared Owl and Mallard. The overall population increased 53%. All species present showed an increase. They included: Clay-colored Sparrow (350%), Com. Yellowthroat (116%), Le Conte's Sparrow (100%), Swamp Sparrow (25%), and Short-billed Marsh Wren (23%).

193. OPEN FEN. — **Location:** Minnesota, Beltrami Co., 2.8 km SE of Beltrami-Lake of the Woods Co. line on Minn. Hwy 72; 48°22'00"N, 94°32'34"W, Ludlow Lookout Tower Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 15 ha = 37.07 acres. **Description of Plot:** See AB 35: 100 (1980). **Weather:** See introduction. **Coverage:** May 27; June 2, 10, 14, 23, 26, 30; July 10; 0505-0925, CDT. Total man-hours: 14. **Census:** Le Conte's Sparrow, 40 (267, 108); Short-billed Marsh Wren, 21 (140, 57); Bobolink, 9 (60, 24); Savannah Sparrow, 1. **Total:** 4 species; 71 territorial males or females (473/km²; 192/100 acres). **Visitors:** Short-eared Owl, Tree Swallow, White-throated Sparrow. **Remarks:** Changes in the species composition from 1980 included the addition of the Savannah Sparrow and the absence of the Short-eared Owl. The overall population increased 61%. All species showed an increase. They included: Le Conte's Sparrow (67%), Short-billed Marsh Wren (75%), and Bobolink (29%).

194. TAMARACK BOG AND HARDWOOD — **Location:** Michigan; Berrien Co., 1 mi SW of Stevensville in Grand Mere State Park, 5 mi N of Willow Drive on Wishart Rd; 41°59'30"N, 86°33'W, Bridgman Quadrangle, USGS. **Continuity:** Established 1976; 6 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AB 30: 1049 (1976). **Weather:** Normal. **Coverage:** May 31; June 7, 13-14, 20-21, 28; July 5; 0600-2100 hours. Total man-hours: 8. **Census:** Wood Thrush, 3 (35, 14); Veery, 3; Canada Warbler, 3; E. Wood Pewee, 2; Blue Jay, 2; Whip-poor-will,

1, Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; White-breasted Nuthatch, 1; Tufted Titmouse, 1; Am Robin, 1; Red-eyed Vireo, 1; Ovenbird, 1; Scarlet Tanager, 1; Cardinal, 1. **Total:** 17 species; 25 territorial males (294/km², 119/100 acres). **Visitors:** Com. Crow, Red-winged Blackbird, Com. Grackle. — **JAMES AND CARL MULLINS**, 2558 Locust Lane, Stevensville, MI 49127.

195. 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, Wildhorse Island Quadrangle, USGS. **Continuity:** Established 1975, 7 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** AB 31: 84-85 (1976) **Weather:** All trips on clear or partly cloudy days with moderate or no precipitation and little or no wind. **Coverage:** Apr. 3, 25 May 14, 20, 26; June 10, 18, 20; between dawn and 1100. Total man-hours: 37. **Census:** Yellow-headed Blackbird, 40 (99, 40); Red-winged Blackbird, 23 (57, 23); Song Sparrow, 20 (49, 20); Am. Coot, 15 (37, 15); Mallard, 12 (30, 12); Redhead, 9 (22, 9); Com. Yellowthroat, 9; Am. Robin, 8 (20, 8); Yellow Warbler, 8; Brown-headed Cowbird, 8; Tree Swallow, 7 (17, 7); Pied-billed Grebe, 6 (15, 6); Com Flicker, 6; Willow Flycatcher, 6; Long-billed Marsh Wren, 6; Sora, 5 (12, 5); Mourning Dove, 5; Black-capped Chickadee, 5; Red-breasted Nuthatch, 5; Dark-eyed Junco, 5; Canada Goose, 4 (10, 4); Ring-necked Duck, 4; Cassin's Finch, 4; Pine Siskin, 4; Blue-



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winged Teal, 3 (7, 3); Ruffed Grouse, 3; Hammond's Flycatcher, 3; W. Wood Pewee, 3; Golden-crowned Kinglet, 3; Cedar Waxwing, 3; Evening Grosbeak, 3; Chipping Sparrow, 3; Wood Duck, 2; Com. Goldeneye, 2; Osprey, 2; Com. Nighthawk, 2; Caliope Hummingbird, 2; W. Flycatcher, 2; Barn Swallow, 2; Swainson's Thrush, 2; Am. Redstart, 2; Cinnamon Teal, 1; Ruddy Duck, 1; Com. Merganser, 1; Cooper's Hawk, 1; Prairie Falcon, 1; Dusky Flycatcher, 1; Com. Raven, 1; Ruby-crowned Kinglet, 1; Warbling Vireo, 1; Nashville Warbler, 1; Yellow-rumped Warbler, 1; MacGillivray's Warbler, 1; Great Blue Heron, +; Red-tailed Hawk, +; Goshawk, +; Am. Kestrel, +; Pileated Woodpecker, +; Steller's Jay, +; Clark's Nutcracker, +; Red Crossbill, +; Total: 61 species territorial males (687/km², 278/100 acres). 278. Visitors: Sharp-shinned Hawk,

Ring-billed Gull. Remarks: Nests found (37): Canada Goose, 2; Mallard, 1; Osprey, 2; Prairie Falcon, 1; Am. Coot, 3; Calliope Hummingbird, 1; Com. Flicker, 3; Willow Flycatcher, 1; Tree Swallow, 4; Long-billed Marsh Wren, 1; Am. Robin, 3; Cedar Waxwing, 1; Yellow-headed Blackbird, 10; Red-winged Blackbird, 3; Song Sparrow, 2. Additional young located: Pied-billed Grebe, 9; Canada Goose, 1; Mallard, 8; Redhead, 2; Com. Goldeneye, 4; Am. Coot, 20; Com. Flicker, 2; Am. Robin, 3; Yellow-headed Blackbird, 11; Dark-eyed Junco, 1; Song Sparrow, 2. Road construction near the NW corner of the marsh during April and May deterred nesting in that area and greatly reduced waterfowl production.—MARCELLA M. BISHOP, Shoreline Route, Polson, MT, 59860.

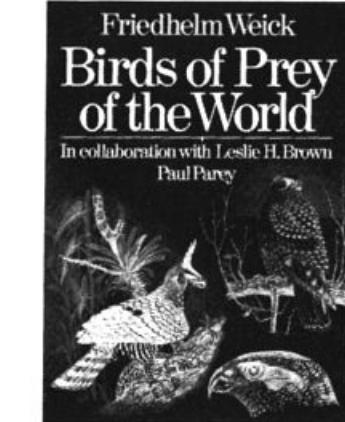
196. WET MEADOW WITH PATCHY WILLOWS.

— Location: Oregon; Harney Co., Malheur Nat'l Wildlife Refuge, about 200 m NW of P Ranch Station in South Meadow Field; 42°50'N, 118°50'W, Page Springs Quadrangle, USGS. Continuity: New Size: 6 ha = 14.8 acres Description of Plot: A rectangle 300 × 200 m. The meadow was continuously flood-irrigated in spring and early summer, then allowed to dry out. Willows (primarily *Salix exigua*) covered 16% of the plot, and ranged in size from 3 to 35 ft in height, but were mostly 20-30 ft. These willows were multi-stemmed and had a thick, bushy appearance. Ten randomly selected transects of 10 daubenmire micro-plots (for a total of 100) were conducted to determine the ground cover. Results from these transects were: 29.0% sedges (*Carex* sp.); 22.8% dead plant litter; 13.4% unidentified grasses; 7.8% Cinquefoil (*Potentilla gracilis*); 6.3% Canada Thistle (*Cirsium arvense*); 3.7% Timothy (*Phleum paniculatum*); 3.6% rushes (*Juncus* sp.); 2.6% blue grass (*Poa* sp.); 2% soil; 1.8% Sweet Pea (*Thermopsis montana*); 1.2% unidentified composite; 1% bedstraw (*Galium* sp.). Edge: Bordered on all sides by similar habitat. Topography: Essentially flat, with slight depressions around some willows. Elevation: 4300 ft. Weather: Late May and early June was wetter and colder than normal, with 4 in. of rain, about half the annual average. The last half of June was typically dry and hot. Coverage: June 5, 7, 9-11, 20, 25; 0530-1700. Total man-hours: 14. Census: Yellow Warbler, 12 (200, 81); Song Sparrow, 8 (134, 54); Savannah Sparrow, 4.5

(75, 30); Am. Robin, 3.5 (58, 24); Red-winged Blackbird, 3 (50, 20); Mallard, 1; Com. Snipe, 1; Willow Flycatcher, 1; Gadwall, +; Marsh Hawk, +; Sandhill Crane, +; Bobolink, +; Am. Goldfinch, +. Total: 13 species; 34 territorial males (568/km², 230/100 acres). Visitors: Red-tailed Hawk Am. Kestrel, Bank Swallow, Barn Swallow, Cliff Swallow, Com. Nighthawk, Red-breasted Nuthatch, Yellow-headed Blackbird, Brewer's Blackbird, and Brown-headed Cowbird. Remarks: Nests found: 1 Am. Robin and 4 Yellow Warbler. Willows covered only 16% of the area, but of the 188 observations of birds plotted on maps of the study area, 70% (138) were in the willows. Willow Flycatcher, Yellow Warbler, Am Robin, Red-winged Blackbird, Song Sparrow, and Am. Goldfinch were associated with willows most or all the time. Except for probably Red-winged Blackbirds, these species were known or thought to nest in the willows, and make up 72% of the breeding pairs on the plot. Bobolinks and Savannah Sparrows were associated with willows part of the time, using them primarily as singing posts. The remaining species that bred were not observed to associate with the willows. American Goldfinches were an enigma in their movements, and possibly did not start to breed until I left. It was also possible that some early nesting ducks could have left before censusing began. This meadow is on a rest-rotation grazing system, and was last grazed during the winter of 1979-80. I thank the Malheur Nat'l Wildlife Refuge for permission to do this study, and for their cooperation in supplying necessary information.—DAN TAYLOR, Box 8007, Idaho State Univ., Pocatello, ID 83209.

197. DESERT RIPARIAN-FRESH-WATER MARSH AND PONDS.

— Location: California; San Bernardino Co., 0.5 mi E of Rte 62, Big Morongo Wildlife Preserve, 34°03'N, 116°35'W, Morongo Valley Quadrangle, USGS. Continuity: Established 1977; 5 consecutive years. Size: 15.38 ha = 38 acres. Description of Plot: See AB 32: 113 (1977). Weather: Clear and calm to windy; cloudy, 1 day with drizzles, 34-80°F. Coverage: Apr. 30; May 7, 15, 21, 26, 28; June 4, 11; 0530-1000. Total man-hours: 25. Census: Lesser Goldfinch, 21 (137, 55); Bewick's Wren, 15 (98, 39); Starling, 11 (72, 29); House Finch, 9 (59, 24); Song Sparrow, 8 (52, 21); Gambel's Quail, 7 (46, 18); Brown-headed



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Cowbird, 6 females (39, 16); Rufous-sided Towhee, 6; Black-chinned Hummingbird, 5 (33, 13); Costa's Hummingbird, 5; House Wren, 5; Mourning Dove, 4 (26, 11); Ash-throated Flycatcher, 4; Yellow-breasted Chat, 4; Virginia Rail, 3 (20, 8); Verdin, 3; California Thrasher, 3; Lucy's Warbler, 3; Phainopepla, 3; Com. Yellowthroat, 3; N. Oriole, 3; Summer Tanager, 3; Nuttall's Woodpecker, 2.5; Bushtit, 2; Blue-gray Gnatcatcher, 2; Indigo Bunting, 2; Am. Kestrel, 1; Barn Owl, 1; Great Horned Owl, 1; Wied's Crested Flycatcher, 1; Willow Flycatcher, 1; Hooded Oriole, 1; Cooper's Hawk, +; Red-tailed Hawk, +. Total: 34 species; 148.5 territorial males or females (966/km², 391/100 acres). Visitors: White-winged Dove, Spotted Dove, Roadrunner, W. Kingbird, Black Phoebe, Scrub Jay, Cactus Wren, Mockingbird, Black-headed Grosbeak, Lawrence's Goldfinch, Lark Sparrow. Remarks: Nests located (31): Am. Kestrel, 1; Black-chinned Hummingbird, 4; Costa's Hummingbird, 2; Ash-throated Flycatcher, 1; Verdin, 1; Bushtit, 1; House Wren, 1; Blue-gray Gnatcatcher, 1; Starling, 8; Lucy's Warbler, 1; Hooded Oriole, 1; Indigo Bunting, 1; House Finch, 1; Lesser Goldfinch, 7. The area was very wet even though there was much less rainfall the past winter than the previous 2 years. Much undergrowth including cat-tails and sedges has resulted from surface and subsurface water. Virginia Rails were observed with downy young. Common Yellowthroats and Yellow-breasted Chats increased in numbers. An Indigo Bunting nest was found. A Willow Flycatcher was on territory for the first time. A young Brown-headed Cowbird was removed from the Blue-gray Gnatcatcher nest. Western Wood Pewee, Swainson's Thrush, Warbling Vireo, Yellow Warbler were singing late but were not present during the last census indicating late migrants. Special thanks to San Bernardino Valley Aud. Soc. and the San Bernardino County Museum for supporting this study.—EUGENE A. CARDIFF, JESSIE and ROY KNIFFEN, San Bernardino County Museum, 2024 Orange Tree Lane, Redlands, CA 92373.

198. RESTORED COASTAL BRACKISH MARSH. — Location: California; Humboldt co., 1 mi S of Eureka on SE side of US Hwy 101 and the Elk River; 40°45'N, 124°11'W, Eureka Quadrangle, USGS. Continuity: Established 1980. Size: 8.2 ha = 20.3 acres.

Description of Plot: See AB 35: 101-102 (1981). **Weather:** Temperature, 44-61°F; 7 out of 9 days were overcast with low clouds or fog while 2 were mostly fair and sunny. **Coverage:** May 12, 14, 19, 21, 25-26, 30; June 2, 4; 0530-1000 and 1805-2110. Total man-hours: 33. **Census:** Long-billed Marsh Wren, 22 (268, 108); Song Sparrow, 17 (207, 84); Am. Goldfinch, 4 (49, 20); Brown-headed Cowbird (females), 2; Mallard (female), 1; Swainson's Thrush, 1; Savannah Sparrow, 1. **Total:** 7 species; 48 territorial males or females (584/km²; 236/100 acres). **Visitors:** Green Heron, Turkey Vulture, White-tailed Kite, Marsh Hawk, Vaux's Swift, Allen's Hummingbird, Belted Kingfisher, Violet-green Swallow, Tree Swallow, Rough-winged Swallow, Barn Swallow, Cliff Swallow, Cedar Waxwing, Orange-crowned Warbler, and White-crowned Sparrow. **Remarks:** American Goldfinch territories were determined by subsequent censuses on June 10, 15, 20, 22, 26, 30, and July 3, 5, 10, 15, 19, 22, 25. Nests and young were found for the following species: Mallard, Long-billed Marsh Wren, Am. Goldfinch, and Song Sparrow. Young Brown-headed Cowbirds (host: Song Sparrow) were also sighted. The Swainson's Thrush, always observed alone in a clump of large willows on some higher ground in the extreme N apex of the plot, was not found after June 2. Probably a different Mallard hen was noted to successfully nest on the plot in censuses carried out Mar. 12-Apr. 10. This is the first year following dike breaching on Sept. 17, 1980 for restoration of tidal influence. A vegetation analysis conducted on July 6 showed that 11 of the 32 species recorded in the vegetation analysis were no longer present in the 61 one m² sample plots. Most notably, Bedstraw (*Galium aparine*), and Fireweed (*Epilobium watsonii* var. *franciscanum*), among other species, appear to be relatively poorly adapted for exposure to brackish water and are disappearing from the site. Concurrently, Fat Hen (*Atriplex patula* var. *obtusa*), a halophytic species, has nearly tripled. This trend is supported to a lesser extent by other halophytes (i.e. Salt Grass (*Distichlis spicata*), and Pickleweed (*Salicornia virginica*)). Coyote Brush (*Baccharis pilularis* var. *consanguinea*) has undergone a small increase. However, many Coyote Brush plants in low lying areas such as along drainage ditches which now channel tide water, have died or are dying, presumably from exposure to brackish water. Thanks to Mark

Stopher for the vegetation analysis along with Paul F. Springer and Richard E. Genelly for advice. This investigation was funded by the Calif. Dept. of Transportation.—DANA L. BASE, 2128 Quaker St., Eureka, CA 95501.

199. HAY MEADOW. — Location: New York, St. Lawrence Co., Pierrepont. Bowers farm on W side of Morrill Rd 44°35'N, 75°02'W, Pierrepont 7.5' Quadrangle, USGS. Continuity: New. Size: 2.3 ha = 5.7 acres (rectangular, paged). Description of Plot: Dominant plants, in approximate order of abundance, are Timothy (*Phleum pratense*), Birdfoot Trefoil (*Lotus corniculatus*), vetch (*Vicia sp.*), *Galium sp.*, buttercup (*Ranunculus sp.*). The field is mowed once a year. Edge: The E side is bordered by a paved road with Sugar Maples (*Acer saccharum*) along the shoulder. The S

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end is demarcated from lawn and pasture by a hedgerow consisting of maples, 2 small dead elms, and shrubs (*Viburnum* and *Vitis*); to the N is an abandoned orchard. There is a small garage at the NE corner. **Topography:** Almost flat; slopes slightly to NW. Land drops sharply beyond W edge. **Elevation:** 70 ft. **Weather:** Relatively warm and dry (see census 7). **Coverage:** May 11, 20, 23-27; June 5, 15; 0430-2000, EST. Total man-hours: 2. **Census:** Red-winged Blackbird, 5 (217, 88); Bobolink 2.5 (109, 44); Com. Grackle, 1.5 (65, 26); E. Meadowlark, 1; E. Kingbird, +. **Total:** 5 species; 10 territorial males (434/km², 175/100 acres). **Visitors:** Barn Swallow, Am. Robin, Starling, Warbling Vireo, Yellow Warbler, Com. Yellowthroat, Chipping Sparrow, Song Sparrow.—*KENNETH L. CROWELL, Dept. of Biol., St. Lawrence Univ., Canton, NY 13617.*

200. OLD FIELD HABITAT. — **Location:** New Jersey; Morris Co., Great Swamp Nat'l Wildlife Refuge, 1 mi E of Basking Ridge, 40°42'30"N, 74°30'W, Bernards Quadrangle, USGS. **Continuity:** Established 1980. **Size:** 7.3 ha = 18.1 acres. **Description of Plot:** See AB 35: 72 (1981). **Weather:** Average temperature for May, 64°F (28-86°). Total rainfall, 4.66 in. Average temperature for June, 67°F (41-86°). Total rainfall, 3.89 in. **Coverage:** May 26, 29; June 1, 5, 10, 17, 23; July 12; 0530-0700. Total: 12 man-hours. **Census:** Yellow Warbler, 14 (191, 77); Song Sparrow, 14; Com. Yellowthroat, 11 (150, 61); Willow Flycatcher, 6 (82, 33); Gray Catbird, 6; Blue-winged Warbler, 3.5 (48, 19); White-eyed

Vireo, 1; Field Sparrow, 1; Swamp Sparrow, 1. **Total:** 9 species; 57.5 territorial males (785/km², 318/100 acres). **Visitors:** Ring-necked Pheasant, Com. Flicker, Am. Robin, Cedar Waxwing, Yellow-breasted Chat, Red-winged Blackbird, Brown-headed Cowbird, Am. Goldfinch, Rufous-sided Towhee.—*JOANNE LASKOWSKI, 149 Pleasant Plains Rd., Basking Ridge, NJ 07920.*

201. ABANDONED FIELD I. — **Location:** Pennsylvania; Luzerne Co., 2.6 km NNE of Wapwallopen; 41°05'N, 76°07'W, Sybertsville Quadrangle, USGS. **Continuity:** Established 1978; 4 consecutive years. **Size:** 6 ha = 14.8 acres. **Description of Plot:** See AB 34: 102 (1980) and addendum in AB 35:102 (1981). **Weather:** See Census 60. **Coverage:** Apr. 27; May 5, 15, 21, 22, 26-27, 29; June 1, 10-11, 18, 29-30; July 2, 15, 17; Aug. 2, 18, 27-28; 0430-1230, EST. Total man-hours: 79. **Census:** Com. Yellowthroat, 10 (167, 68); Field Sparrow, 10; Song Sparrow, 5.5 (92, 37); Cedar Waxwing, 4 (67, 27); Prairie Warbler, 2.5; Yellow-breasted Chat, 2.5; Am. Goldfinch, 2.5; Starling, 2; Rufous-sided Towhee, 2; Indigo Bunting, 1.5; E. Kingbird, 1; Willow Flycatcher, 1; Gray Catbird, 1; Golden-winged Warbler (male)/Brewster's Warbler (female), 1; Blue-winged Warbler, 0.5; Cardinal, 0.5; Am. Kestrel, +; Com. Flicker, +. **Total:** 17 species and 1 hybrid; 47.5 pairs (793/km², 321/100 acres). **Visitors:** Mourning Dove, Yellow-billed Cuckoo, Black-billed Cuckoo, Ruby-throated Hummingbird, Downy Woodpecker, Great Crested Flycatcher, Barn Swallow, Blue Jay, Black-capped Chickadee, Am. Robin, Chestnut-sided Warbler, Am. Redstart, Orchard Oriole, N. Oriole, Com. Grackle, Brown-headed Cowbird. **Remarks:** Breeding bird density increased for the third straight year to a level more than twice that of 1978's original census. This was partly a result of vegetational succession and also to more intensive knowledge of some species obtained from banding. For example, banding revealed a higher density of ♂ yellowthroats than would have been realized from standard spot-mapping techniques. Confusion caused by dense vegetation and high territory density was somewhat clarified by banding. Nests found: E. Kingbird, 1; Cedar Waxwing, 4; Starling, 2; Golden-winged Warbler/Brewster's Warbler, 1; Yellow-breasted Chat, 2; Am. Goldfinch, 1; Rufous-sided Towhee, 1; Field Sparrow, 3. In addition, young-of-the-year Broad-winged Hawk, Am. Kestrel, Mourning Dove, Com. Flicker, Gray Catbird, Am. Robin, Com. Yellowthroat, N. Oriole, Orchard Oriole, Com. Grackle, Brown-headed Cowbird, and Song Sparrow were observed. Kingbirds and Starlings nested on transmission structures. Brewster's Warbler (female) conformed to Form 2 of Parkes' system. Waxwings invaded in late July; 3 of the 4 nests found were not built until August. Thanks to D. G. Richie for assistance. This census is part of a study supported by the Pennsylvania Power and Light Company.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.*

41°04'N, 76°07'W, Berwick Quadrangle, USGS. **Continuity:** Established 1979 (1980); 3 consecutive years. **Size:** 4.34 ha = 10.7 acres. **Description of Plot:** See AB 35: 102-3 (1981). **Weather:** Like Census 60 except that this plot was generally foggy near dawn. **Coverage:** Apr. 28; May 4, 14, 20, 21, 24, 29; June 8, 22, 24, 30; July 9, 23, 24; Aug. 17, 26; from 0430-1230, EST. Total man-hours: 45. **Census:** Field Sparrow, 7.5 (173, 70); Song Sparrow, 7 (162, 65); Red-winged Blackbird, 3 (69, 28); Com. Yellowthroat, 2.5; Willow Flycatcher, 2; Cedar Waxwing, 2; Am. Goldfinch, 2; Yellow Warbler, 1; Gray Catbird, 0.5; Am. Robin, +; Com. Grackle, +. **Total:** 11 species; 27.5 pairs (635/km², 257 acres). **Visitors:** Mallard/Black Duck hybrid, Mourning Dove, Black-billed Cuckoo, Barn Swallow, Brown Thrasher, Prairie Warbler, Am. Redstart, N. Oriole, Indigo Bunting, Rufous-sided Towhee. **Remarks:** Nests found: Willow Flycatcher, 2; Gray Catbird, 1; Cedar Waxwing, 1; Yellow Warbler, 1; Red-winged Blackbird, 3; Am. Goldfinch, 2; Field Sparrow, 3; Song Sparrow, 1. Goldfinches did not nest until late July and waxwings, late August. In addition, young-of-the-year Mourning Dove, Am. Robin, Com. Yellowthroat, and Com. Grackle were observed. Thanks to D. G. Richie for assistance. This census is part of a study supported by the Pennsylvania Power and Light Company.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.*

203. OLD FIELD. — **Location:** Pennsylvania; Schuylkill Co., 1 mi SW of the village of



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Weishample; 40°41'N, 76°27'W, Tremont Quadrangle, USGS. **Continuity:** Established 1974; 8 consecutive years. **Size:** 7.12 ha = 17.58 acres. **Description of Plot:** See AB 28: 1053 (1974). **Weather:** Cool to warm with temperatures 42-72°F. Most count days were clear with some early morning fog and haze. **Coverage:** May 29-31; June 1, 9, 16, 23, 30; 0520-1130. Total man-hours: 8. **Census:** Field Sparrow, 8 (112, 46); House Wren, 3 (42, 17); Golden-winged Warbler, 3; Com. Yellow-throat, 3; Rufous-sided Towhee, 3; Gray Catbird, 2; Indigo Bunting, 2; Black-capped Chickadee, 1; Wood Thrush, 1; Blue-winged Warbler, 1; Yellow Warbler, 1; Am. Goldfinch, 1; Song Sparrow, 1; Great Crested Flycatcher, +; Cardinal, +. **Total:** 15 species; 30 territorial males or females (422/km², 171/100 acres). **Visitors:** Am. Woodcock, Acadian Flycatcher, Prairie Warbler, N. Oriole. **Remarks:** Nests found: House Wren, 2 (in nest boxes).—**ROLAND BERGNER, William Penn Memorial Museum, Box 1026, Harrisburg, PA 17120.**

204. GRASSLAND MUNICIPAL AIRPORT.—**Location:** Louisiana; Natchitoches Par., municipal airport of Natchitoches, 31°44'N, 93°06'W; Provencal Quadrangle, USGS. **Continuity:** New. **Size:** 12.14 ha = 30 acres (rectangular, 1320 × 990 ft, measured with steel tape). **Description of Plot:** See AB 28: 711-712 (1974). **Weather:** During the 19-day period, day temperatures were 78-95° with 6 count days 80° or higher. Night lows were 62-78°; 2 days were mostly cloudy and 6 were mostly sunny to sunny. Wind was moderate to calm. **Coverage:** June 10-11, 15, 17, 20-21, 25, 28; 0730-0900. Total man-hours: 8. **Census:** Dickcissel, 22 (181, 73); Red-winged Blackbird, 18 (148, 60); E. Meadowlark, 10 (82, 33); Killdeer, +; Brown-headed Cowbird, +. **Total:** 5 species; 50 territorial males (412/km², 167/100 acres). **Visitors:** Cattle Egret, Rock Dove, Barn Swallow, Purple Martin, Com. Grackle.—**ELLEN M. KRUK and CHARLIE VIERS, Dept. of Biological Sciences, Northwestern State Univ. of Louisiana, Natchitoches, LA 71457.**

BREEDING BIRD CENSUSES ALONG THE PLATTE RIVER IN SOUTH-CENTRAL NEBRASKA

The following 3 censuses were conducted on Mormon Island Crane Meadows (MICM), a 2000 acre (809 ha) tract of land recently purchased by The Platte River Whooping Crane Critical Habitat Maintenance Trust and managed by The Nature Conservancy. All 3 were also censused in 1980 but results were not published. MICM is located approximately 10 mi S of Grand Island. The area is bordered by two channels of the Platte River and is representative of a floodplain tallgrass prairie community. The shallow, sandy-loam soils are underlain by a water table within 1-5 ft of the surface. Relic channels are interspersed in the wetland meadow plot. Study plots were randomly selected based on providing uniformity. Future burning treatments are planned for these sites; thus this study is designed to provide pre-treatment data. Weather data were acquired from a climatological station in Grand Island. Precipitation was 0.60 in. in June and 3.45 in.

in July, below normal. Temperatures averaged 73.2°F in June and 75.8° in July, slightly above normal. Special acknowledgements to Fred Deines, John Cochran, and Jim Henriksen for their assistance.—**MIRIAM A. HAY and GARY R. LINGLE, The Nature Conservancy, 2550 N. Diers Ave, Suite H, Grand Island, NE 68801.**

205. SUBIRRIGATED GRASSLAND.

Location: Nebraska; Hall Co., NE ¼ of the SE ¼ of Sec. 33, T10N, R10W, Alda Quadrangle, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (square, 440 × 440 yds, surveyed). **Description of Plot:** Lies within a 300 acre pasture which is currently grazed. Dominant species are Big Bluestem (*Andropogon gerardii*), Switch Grass (*Panicum virgatum*), Redtop (*Agrostis stolonifera*), Smooth Brome (*Bromus inermis*), Kentucky Blue Grass (*Poa pratensis*), and sedges (*Carex* spp.). Common species are Indian Grass (*Sorghastrum nutans*), Prairie Cord Grass (*Spartina pectinata*), W. Wheat Grass (*Agropyron smithii*), ragweed (*Ambrosia* spp.) and goldenrod (*Solidago* spp.). Also present were Wild Barley (*Hordeum jubatum*), horsetail (*Equisetum* spp.), White Prairie Clover (*Petalostemon candidum*), Purple Prairie Clover (*P. purpureum*), and Red Clover (*Trifolium pratense*). **Edge:** Similar on the S, W, and N sides, with a shelterbelt running along the E edge, about 20 m from the boundary. **Topography:** Flat. **Elevation:** About 1900 ft. **Coverage:** June 5, 7-10, 12, 16; 0630-0845, CDT. Total man-hours: 4. **Census:** Bobolink, 9 (36, 23); Grasshopper Sparrow, 4 (25, 10); E. Meadowlark, 3.5 (22, 9); Upland Sandpiper, 3 (19, 8); Brown-headed Cowbird, 2; Dickcissel, 1.5. **Total:** 6 species; 21 territorial males or females (130/km², 53/100 acres). **Visitors:** Ring-necked Pheasant, Mourning Dove, Black-billed Cuckoo, Com. Flicker, Barn Swallow, Blue Jay. **Remarks:** Nests found: Upland Sandpiper, 2; E. Meadowlark, 1.

206. SUBIRRIGATED NATIVE HAY.

Location: Nebraska; Hall Co., NW ¼ of the SW ¼ of Sec. 34, T10N, R10W, Alda Quadrangle, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (square, 440 × 440 yds, surveyed). **Description of Plot:** A native hayfield mowed annually; 10 acres were plowed and seeded to Smooth Brome (*Bromus inermis*) prior to 1946. Alfalfa (*Medicago sativa*) became established after cattle were winter fed on the plot. Dominant species were Smooth Brome, Alfalfa, Big Bluestem (*Andropogon*

gerardii), and Kentucky Blue Grass (*Poa pratensis*). Common species were Indian Grass (*Sorghastrum nutans*), Switch Grass, (*Panicum virgatum*), Red Clover (*Trifolium pratense*), Wild Licorice (*Glycyrrhiza lepidota*), Black Medic (*Medicago lupulina*), horsetail (*Equisetum* spp.), and spikerush (*Eleocharis* spp.). Also present were Yellow Sweet Clover (*Melilotus officinalis*), Goatsbeard (*Tragopogon dubius*), and Black-eyed Susan (*Rudbeckia hirta*). **Edge:** Similar on all sides. A shelterbelt runs about 30 m from the W edge. **Topography:** Essentially flat. **Elevation:** About 1900 ft. **Coverage:** June 5, 7-10, 12, 16; 0642-0815, CDT. Total man-hours: 4. **Census:** Bobolink, 9 (36, 23); Grasshopper Sparrow, 5 (31, 13); E. Meadowlark, 2.5, Brown-headed Cowbird, 2.5 (females); Upland Sandpiper, 2; Dickcissel, 2; Mourning Dove, 1. **Total:** 7 species; 24 territorial males or females (148/km², 60/100 acres). **Visitors:** Com. Flicker, E. Kingbird, Barn Swallow, Starling, Am. Goldfinch. **Remarks:** Dickcissels were absent on June 5 but established territories after a nearby alfalfa field was mowed.

207. WETLAND SEDGE MEADOW.

Location: Nebraska; Hall Co., NE ¼ of the NW ¼ of Sec. 34, T10N, R10W, Alda Quadrangle.

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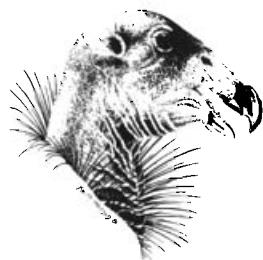
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range, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (square, 440 × 440 yds, surveyed). **Description of Plot:** Located in a 900 acre wetland sedge meadow pasture which is grazed annually. Ribbons of wetland species are found in intermittent relic channel areas. Dominant species on mesic sites are sedges (*Carex* spp.), Prairie Cord Grass (*Spartina pectinata*), Bulrush (*Scirpus* spp.), Redtop (*Agrostis stolonifera*), ragweed (*Ambrosia* spp.), Fog Fruit (*Phyla lanceolata*), goldenrod (*Solidago* spp.), Wild Barley (*Hordeum jubatum*), and Verbena spp.). Dominant species on xeric sites are Kentucky Blue Grass (*Poa pratensis*), Salt Grass (*Distichlis spicata*), Switch Grass (*Panicum virgatum*), verbena, and goldenrod. **Edge:** Similar on all 4 sides. **Topography:** Flat. **Elevation:** About 1900 ft.

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Coverage: June 5, 7-10, 12, 16; 0610-0835, CDT. Total man-hours: 4.5. **Census:** Grasshopper Sparrow, 5 (31, 13); Bobolink, 4 (25, 10); Upland Sandpiper, 3.5 (22, 9); Dickcissel, 3.5; E. Meadowlark, 2.5; Brown-headed Cowbird, 2.5; Blue-winged Teal, 1. **Total:** 7 species; 22 territorial males or females (136/km², 55/100 acres). **Visitors:** Ring-necked Pheasant, Wilson's Phalarope, Com. Flicker, E. Kingbird, Barn Swallow. **Remarks:** Nests found: Blue-winged Teal (1).

208. SMALL TOWN, RESIDENTIAL AND COMMERCIAL AREAS. — **Location:** Canada; New Brunswick; Sackville, 45°54'N, 64°22'W, map sheet 21H/16; bounded by Bridge, York, Lansdowne, Park, and Salem Sts, and Queens Rd, and vacant lots along Lorne St. **Continuity:** Established 1979; 2 intermittent years. **Size:** 50.5 ha = 124.8 acres. **Description of Plot:** See AB 33: 52 (1979) and 34: 103-104 (1980). **Weather:** May and June were slightly warmer than usual; May was very dull, but with normal rainfall, whereas June was rather dry. Most surveys were made under favorable conditions, only one having winds of force 3 (Beaufort) other than in gusts. Survey temperatures, 3-17°C (37°-63°F). **Coverage:** May 15, 22, 29; June 2, 11, 19, 22, 28; July 7, 9; 0520-0815. Total man-hours: 23. **Census:** House Sparrow, 46.5 (92, 37); Starling, 24.5 (49, 20); Am. Robin, 14 (28, 11); Com. Grackle, 13 (26, 10); Am. Redstart, 8, (16, 6); Rock Dove, 7 (14, 6); Song Sparrow, 6 (12, 5); Chipping Sparrow, 4.5 (9, 4); Red-eyed Vireo, 4 (8, 3); E. Wood Pewee, 2; Com. Crow, 1.5; Am. Goldfinch, 1.5; Tree Swallow, 1; Black-capped Chickadee, 1; Yellow Warbler, 1; Downy Woodpecker, 0.5. **Total:** 16 species; 136 territorial males or pairs (269/km²; 109/100 acres). **Visitors:** Of 20 other species recorded, only Purple Finch might have bred in 1981; Gray Catbird and Cedar Waxwing were both noted on June 19 and 22 but not before or subsequently. Tennessee Warbler and Evening Grosbeak were noted in May and again from June 28, but not in between. **Remarks:** House Sparrow numbers were only 2/3 those found in 1979; evidently recovery from a die-off in the winter of 1979-80 (N.S. Bird Soc. Newsletter 22: 183-184, 1980) has been delayed.—*ANTHONY J. ERSKINE, Canadian Wildlife Service, Sackville, N.B., Canada E0A 3CO.*

209. VILLAGE, RESIDENTIAL. — **Location:** Ohio; Wyandot Co., Crawford Town-

ship, Carey, on the NE edge, and E of the area censused in 1980 (AB 35: 110 (1981), E of N Vance St, N of Dow St, W of the railroads, approximately 40°57'N, 83°23'15"W, Carey Quadrangle, USGS. **Continuity:** New. **Size:** Approximately 14.2 ha = 35 acres. **Description of Plot:** See AB 31: 91 (1977) and 32: 124 (1978) for a generalized village environment. **Edge:** Supplied by streets, alleys, ditch, and railroads. Total street-miles, 1.09, 0.66 railroad-miles, 0.24 ditch-miles. Total street-edge miles, 1.65, railroad-edge miles, 0.85 Total trees per street-edge mile, 73. Street trees are mostly Silver Maple (*Acer saccharinum*), many of them 2-3 ft dbh. **Elevation:** 820 ft. **Coverage:** Almost daily. Total man-hours: 70. **Census:** House Sparrow, 12 (85, 34); Am. Robin, 7 (49, 20); House Wren, 5 (35, 14); Starling, 4 (28, 11); Com. Grackle, 3 (21, 9); Song Sparrow, 3; Mourning Dove, 2; Cardinal, 2; Am. Goldfinch, 2; Chipping Sparrow, 2; White-breasted Nuthatch, 1; Gray Catbird, 1; Cedar Waxwing, 1; Indigo Bunting, 1. **Total:** 14 species, 46 pairs (325/km²; 131/100 acres). **Remarks:** More diversification of habitats and edges did not lead to an expected higher density nor increased richness of species, when compared to the 1980 census, although higher than in some previous years. Marginal street and railroad traffic plus industrial activity may have limited the results.—*A. H. CLAUGUS 228 S. Lake St, Carey, OH 43316.*



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