

Forty-seventh Breeding Bird Census*Edited by Willet T. and Aldeen C. Van Velzen*

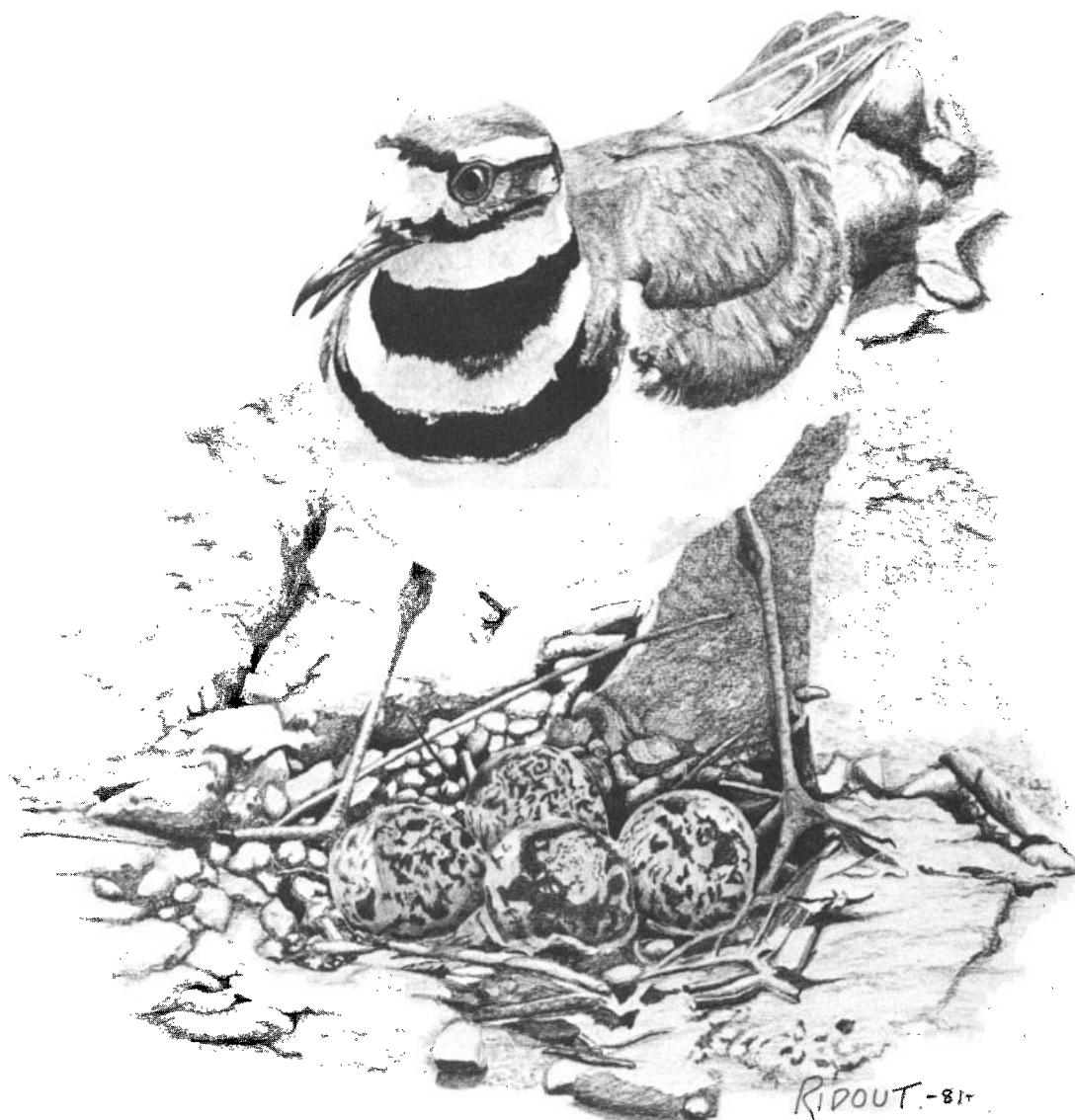
Habitat	State or Province	Hectares	Pairs per sq.km.	Hrs. Obs.	Species	Yrs. of Study
A. Eastern—Deciduous Forest						
1. Second-growth Hardwood Forest	Connecticut	10.1	1094	16	41	17
2. Mixed Upland Forest	New York	42.2	315	39	54	3
3. Red Maple Swamp	New Jersey	5.5	430	8	11	1
4. Aspen (Cut 1980-81)	Pennsylvania	4.2	167	7	4	2
5. Aspen (Cut 1976-77)	Pennsylvania	4.0	547	7	15	2
6. Mixed Oak (Cut 1976-77)	Pennsylvania	3.3	360	5	9	2
7. Mature Aspen (Treated Sector)	Pennsylvania	2.6	536	5	16	2
8. Mature Mixed Oak (Treated Sector)	Pennsylvania	3.2	262	5	14	2
9. Mature Aspen (Untreated Sector)	Pennsylvania	3.0	167	5	11	2
10. Birch—Maple—Oak Forest	Pennsylvania	9.0	579	—	29	7
11. Black Cherry—Maple Clearcut	Pennsylvania	3.0	483	16	9	1
12. Black Cherry—Maple Clearcut	Pennsylvania	3.0	583	16	12	1
13. Black Cherry—Maple Clearcut	Pennsylvania	3.0	917	16	11	1
14. Black Cherry—Maple Clearcut	Pennsylvania	3.0	500	16	8	1
15. Black Cherry—Maple Clearcut	Pennsylvania	3.0	833	16	13	1
16. Black Cherry—Maple Clearcut	Pennsylvania	3.0	483	16	10	1
17. Oak—Maple Ridge-top Forest	Pennsylvania	19.4	119	12	11	2
18. Oak—Maple Slope Forest	Pennsylvania	16.9	142	11	16	2
19. Sugar Maple—Mixed Hardwood Forest	Pennsylvania	9.7	755	28	28	2
20. Upland Oak—Maple Forest (Sprayed)	Pennsylvania	20.0	328	32	23	1
21. Upland Oak—Maple Forest (Unsprayed)	Pennsylvania	20.0	358	32	21	1
22. Mature Deciduous Floodplain Forest	Maryland	7.6	863	29	25	31
23. Mixed Hardwood Forest	Maryland	11.3	1341	27	49	19
24. Mixed Upland Habitat	Dist. of Columbia	14.2	830	24	22	24
25. Cherry—Locust—Oak Forest	West Virginia	6.1	420	15	17	1
26. Cherry—Tulip-tree—Locust	West Virginia	6.1	618	10	25	1
27. Maple—Beech Forest	West Virginia	6.1	247	34	15	6
28. Maple—Oak—Beech Forest	West Virginia	6.1	363	10	14	5
29. Upland Black Cherry Forest	West Virginia	6.1	346	8	14	3
30. Wild Cherry—Hickory Forest	West Virginia	6.1	528	10	23	1
31. Mesophytic Forest	Virginia	6.1	1202	24	23	1
32. Mixed Oak Forest	Virginia	8.1	333	18	22	2
33. Oak—Hickory Forest	Virginia	6.1	272	10	16	1
34. Upland Oak—Hickory Forest	Virginia	11.0	1036	43	23	11
35. Floodplain Forest	North Carolina	13.0	696	20	26	7
36. Mixed Deciduous Forest	North Carolina	12.6	614	21	31	8
37. Hardwood Swamp Forest	South Carolina	8.1	1835	16	22	3
38. Hardwood Woodlot	Ontario	10.2	152	14	7	1
39. Urban Maple—Oak Woodlot (1978)	Ontario	4.0	346	11	12	1
(1979)		4.0	408	10	13	2
(1980)		4.0	741	10	22	3
(1981)		4.0	605	9	23	4
40. Urban Basswood—Maple Woodlot (1978)	Ontario	2.2	494	4	9	1
(1979)		2.2	539	6	10	2
(1980)		2.2	764	8	13	3
(1981)		2.2	741	4	13	4
41. Urban Beech—Ash—Maple Woodlot (1978)	Ontario	1.3	797	2	6	1
(1979)		1.3	797	4	4	2
(1980)		1.3	917	5	6	3
(1981)		1.3	1076	2	6	4
42. Urban Oak—Maple Woodlot (1978)	Ontario	0.9	730	3	9	1
(1979)		0.9	786	5	6	2
(1980)		0.9	618	6	9	3
(1981)		0.9	112	2	6	4
43. Urban Young Ash—Hawthorn Woodlot (1979)	Ontario	1.3	562	5	6	1
(1980)		1.3	674	6	10	2

Habitat	State or Province	Hectares	Pairs per sq.km.	Hrs. Obs.	Species	Yrs. of Study
44. Urban Mixed Deciduous with Pines (1980)	Ontario	2.2	1213	7	15	1
45. Urban Oak–Maple–Ash Woodlot (1978)	Ontario	1.1	808	3	12	1
(1979)		1.1	713	5	8	2
(1980)		1.1	1140	5	9	3
46. Urban Maple–Oak–Birch Woodlot (1978)	Ontario	2.3	750	5	15	1
(1979)		2.3	794	7	15	2
(1980)		2.3	927	10	16	3
47. Urban Maple–Ash Woodlot (1979)	Ontario	1.9	263	3	6	1
(1980)		1.9	421	6	9	2
48. Urban Maple–Beech Woodlot (1979)	Ontario	1.5	549	3	5	1
(1980)		1.5	515	5	9	2
49. Urban Maple–Oak–Beech Woodlot (1979)	Ontario	1.1	713	3	6	1
(1980)		1.1	808	4	7	2
50. Urban Oak–Cherry Woodlot (1979)	Ontario	2.4	1194	16	18	1
(1980)		2.4	1277	16	19	2
(1981)		2.4	1152	6	19	3
51. Urban Hickory–Maple Woodlot (1979)	Ontario	1.9	657	6	13	1
(1980)		1.9	605	7	12	2
52. Urban Hickory–Ash–Basswood Woodlot (1979)	Ontario	0.8	845	5	13	1
(1980)		0.8	1040	5	10	2
53. Urban Hickory Woodlot (1979)	Ontario	1.6	602	6	10	1
(1980)		1.6	539	6	12	2
54. Urban Ash–Oak Woodlot (1979)	Ontario	1.2	659	4	9	1
(1980)		1.2	906	5	14	2
55. Urban Maple–Oak Woodlot (1979)	Ontario	0.9	674	4	7	1
(1980)		0.9	786	4	8	2
56. Urban Maple–Oak–Ash Woodlot (1978)	Ontario	7.0	589	22	22	1
(1979)		7.0	754	18	21	2
(1980)		7.0	963	23	23	3
(1981)		7.0	805	8	25	4
57. Soft Maple–Hickory Woodlot	Ontario	14.3	434	17	17	1
58. Wooded City Ravine	Ontario	20.0	175	20	17	14
59. Moist Deciduous Forest	Michigan	10.0	315	26	16	1
60. Mixed Deciduous Second Growth Floodplain Forest	Illinois	29.1	510	89	28	1
61. Oak–Hickory Forest	Illinois	9.1	499	11	25	3
62. Oak–Maple Forest and Edge	Illinois	24.0	233	14	76	45
63. Neotoma Valley	Ohio	20.2	450	80	34	6
64. Mixed Deciduous Forest	Tennessee	25.4	286	10	22	2
65. Upland Hardwood Forest I	Tennessee	6.0	362	10	17	1
66. Upland Hardwood Forest II	Tennessee	6.0	231	10	11	1
B. Eastern-Coniferous-Deciduous (Mixed)						
67. Climax Hemlock–White Pine Forest, with Transition Hardwoods	Connecticut	10.5	1008	16	36	17
68. Burned Pine–Oak Forest	Massachusetts	56.0	208	188	37	1
69. Maple–Pine–Oak Second-growth Forest	Massachusetts	11.8	465	24	24	7
70. Pitch Pine–Scrub Oak Barrens	New York	9.7	336	14	6	7
71. Second-growth Oak–Pitch Pine Forest	New York	9.3	554	37	13	7
72. Upland Mixed Pine–Spruce–Hardwood Plantation	New York	16.6	524	16	31	10
73. Central Hardwood Forest with Scattered Pine	Dist. of Columbia	26.3	321	37	26	24
74. Birch–Spruce–Fir Forest	West Virginia	6.1	585	16	25	3
75. Virgin Spruce–Northern Hardwoods Forest	West Virginia	6.1	651	10	18	6
76. Disturbed Mixed Coniferous–Hardwood Forest	Georgia	9.8	541	—	30	2
C. Eastern-Coniferous						
77. Red Pine Plantation	Connecticut	8.5	1447	15	43	6
78. Upland Christmas Tree Farm	New York	10.7	382	16	19	1
79. Upland Scotch Pine Plantation	New York	9.3	730	22	27	15
80. Spruce–Pine Forest	Pennsylvania	6.1	395	9	18	1
81. Young Spruce Forest	West Virginia	6.1	296	9	11	8
D. Eastern-Mixed Habitat						
82. Mixed Upland Habitat and Swamp	Connecticut	14.2	155	6	23	16
83. Oak–Hemlock Forest, Transition Forest and Thicket	Connecticut	29.6	655	63	38	13
84. Upland Brushy Pasture	Connecticut	8.5	1418	16	39	17
85. Moist Deciduous Forest–Lake Ontario Wetland	New York	16.2	909	8	39	2

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86. Deciduous Forest with Pond and Brook	New Jersey	16.2	321	9	30	20
87. Mixed Lowland Forest and Meadow with Stream	Pennsylvania	8.1	1093	18	42	3
88. Old Field-Meadow and Primary Deciduous Thickets	Pennsylvania	10.1	326	16	21	8
89. Abandoned Pasture Scrubland	Ontario	9.0	506	23	32	2
90. Transitional Mixed Forest-Field	Ontario	6.0	1110	58	20	4
91. Disturbed Oak-Hickory, Pine Stand, Edge, and Pond	Ohio	14.2	593	25	38	45
92. Deciduous Clearcut	Tennessee	20.2	445	10	25	9
93. Mixed-Mesophytic Woods, Fields, and Brush	Tennessee	27.0	378	38	41	7
94. Suburban Cemetery	Alabama	15.0	633	97	25	6
E. Central-Prairie						
95. Restored Tall Grass Prairie	Illinois	12.1	370	9	16	8
96. Tall Grass Prairie I	Iowa	16.0	318	14	14	2
97. Tall Grass Prairie II	Iowa	64.8	159	56	16	2
98. Tall Grass Prairie III	Iowa	44.8	266	34	20	2
99. Kentucky Blue Grass Prairie	North Dakota	4.8	300	3	11	12
100. Mixed Prairie I	North Dakota	10.0	300	6	18	12
101. Mixed Prairie II	North Dakota	6.1	221	3	11	12
102. Mixed Prairie III	North Dakota	6.1	98	4	6	12
103. Mixed Prairie IV	North Dakota	6.1	122	3	8	12
104. Mixed Prairie V	North Dakota	6.1	180	4	9	12
105. Mixed Prairie VIII	North Dakota	8.7	132	4	9	8
106. Floodplain Tall Grass Prairie	Kansas	10.1	257	38	6	10
107. Short Grass Prairie	Kansas	15.0	143	8	5	1
F. Central-Disturbed Habitat						
108. Brome Seeded Dikes-Sewage Lagoons II	Kansas	50.6	62	6	8	1
109. Improved Pasture and Oak-Pine Forest	Oklahoma	9.1	768	27	27	5
110. Oak-Pine Ravine Forest with Clearings	Oklahoma	7.4	770	28	22	5
G. Central-Deciduous						
111. Floodplain Cottonwood Forest	Colorado	9.7	2718	10	6	12
112. Maple-Boxelder Creekbottom	Utah	10.8	626	55	11	3
H. Western-Deciduous						
113. Aspen Forest	Manitoba	16.0	278	19	22	2
114. River Bottom Forest	Manitoba	14.0	382	21	20	7
115. Oak-Hickory Forest I	Kansas	8.1	321	16	15	6
116. Oak-Hickory Forest II	Kansas	8.1	303	20	16	6
117. Oak-Hickory Forest III	Kansas	8.1	488	18	24	6
118. Oak-Hickory Forest IV	Kansas	8.1	457	18	25	6
119. Oak-Hickory Forest V	Kansas	8.1	432	20	26	6
120. Oak-Hickory Forest VI	Kansas	8.1	358	21	25	6
121. Oak-Hickory Forest	Kansas	8.1	562	19	23	3
122. Riparian Woodland	Kansas	15.0	487	9	14	1
123. Deciduous Floodplain Forest	Oklahoma	6.7	1727	38	28	5
124. Scrub Oak-Mountain Mahogany Woodland	Colorado	8.0	369	35	17	4
125. Riparian Woodland-Hanging Gardens	Utah	9.7	340	31	12	1
126. Narrow Creekside Band of Mixed Riparian Woodland	California	13.0	2123	41	41	1
127. Narrow Riverine Band of Willow and Mixed Woodlands	California	13.2	1395	36	40	1
128. Open Creekside Mixed Woodland	California	12.5	1180	34	40	1
129. Riparian Oak Woodland	California	13.0	942	44	32	4
130. Riverine and Creekside Riparian Woodlands	California	9.8	1513	38	40	1
131. Riverine Willow Woodland with Scattered Cottonwoods	California	12.7	1570	30	37	1
132. Tall Willow Woodland	California	10.8	1821	34	37	1
133. Willow Woodland with Dense Riparian Understory	California	12.0	1568	24	37	1
I. Western-Coniferous						
134. Douglas-fir-Ponderosa Pine Forest	Colorado	7.5	418	18	17	2
135. Ponderosa Pine Forest	Colorado	8.1	346	21	14	15
136. Montane Open Douglas-fir Forest	British Columbia	18.0	219	16	18	1
137. Lodgepole Pine-Mixed Coniferous Forest	Washington	9.3	366	9	13	2
138. Burned Pine-Fir Forest	California	8.5	337	44	25	3
139. Mature Pine-Fir Forest	California	8.5	331	44	18	3
140. Mixed Conifer Forest	California	9.0	672	42	25	1
J. Western-Coniferous-Deciduous (Mixed)						
141. Ponderosa Pine-Scrub Oak-Mountain Mahogany Woodland	Colorado	8.1	321	56	10	16

Habitat	State or Province	Hectares	Pairs per sq.km.	Hrs. Obs.	Species	Yrs. of Study
142. Deciduous-Coniferous North Slope	Utah	20.3	297	46	21	2
143. Riparian Woodland-Live Oak-Juniper	Arizona	9.1	1833	90	34	5
144. Juniper-Oak Woods on Limestone Hills	Texas	15.1	444	68	21	4
145. Second-growth Mixed Forest	British Columbia	20.3	291	14	33	1
146. Mixed Mountain Bottomland	British Columbia	6.4	773	14	18	2
147. Montane Mixed Forest	British Columbia	14.0	146	16	17	1
148. Pine-Oak Woodland	California	11.6	396	22	27	1
149. Pine-Oak Woodland	California	10.0	1710	30	21	1
K. Western-Mixed Habitat						
150. Montane Willow Carr	Colorado	3.8	1823	42	19	1
151. Montane Willow Carr	Colorado	13.0	1219	49	22	1
152. Mountain Meadow and Open Coniferous Forest	Colorado	13.0	409	46	24	3
153. Subalpine Willow Carr	Colorado	10.0	635	34	11	1
154. Suburban College Campus	Colorado	18.3	410	15	15	1
155. Campground in Old Orchards	Utah	10.1	860	24	15	3
156. Scattered Mixed Coniferous Forest in Subalpine Meadows and Spruce Bogs	Oregon	32.4	161	14	11	11
157. Riverine Woodland with Intermixed Shrublands	California	12.4	1917	31	47	1
158. Upland Grassland	California	10.0	140	20	3	1
159. Willow Woodland with Ponded and Channeled Water	California	10.6	2310	31	50	1
L. Western-Desert and Scrub						
160. Herbicide-Treated Sagebrush—Yucca	Kansas	15.0	110	7	6	1
161. Burned Sagebrush—Yucca	Kansas	15.0	167	7	6	1
162. Untreated Sagebrush—Yucca	Kansas	15.0	207	9	7	1
163. Chamise Chaparral	California	10.0	745	16	18	1
164. Chaparral with Canyon-bottom Woodland	California	24.1	631	29	32	1
165. Coastal Sage Scrub (Buckwheat Dominated)	California	8.1	414	13	15	2
166. Coastal Sage Scrub (Sage Dominated)	California	8.1	556	15	15	2
167. Coastal Sage Scrub—Live Oaks	California	17.0	716	27	27	1
M. Wetlands						
168. Shrubby Swamp and Sedge Hummocks	Connecticut	8.1	1792	18	28	17
169. Cat-tail—Bulrush Swamp	New Jersey	5.9	614	6	3	4
170. Gulf Coast Salt Marsh	Florida	15.0	287	374	3	4
171. Gulf of Mexico Barrier Island	Florida	51.4	125	42	24	1
172. Tamarack Bog and Hardwood	Michigan	8.5	271	8	18	8
173. Wetland Sedge Meadow I	Nebraska	16.2	257	7	11	3
174. Wetland Sedge Meadow II	Nebraska	16.2	313	8	11	2
175. Bulrush and Cat-tail Marsh in Conifer Forest	Montana	40.5	410	31	48	9
176. Wet Meadow with Patchy Willows	Oregon	6.0	568	14	13	1
177. Desert Riparian—Freshwater Marsh and Ponds	California	15.4	1215	23	39	7
178. Lake with Marsh Edge	California	4.5	3684	16	13	1
179. Montane Meadow	California	10.0	120	22	5	1
180. Riparian Marsh	California	19.2	836	30	29	1
N. Fields and Cultivated Areas						
181. Old Field Habitat	New Jersey	7.3	587	9	10	4
182. Abandoned Field	Pennsylvania	6.4	533	34	6	1
183. Abandoned Farmland (1981)	Illinois	13.5	526	26	23	1
(1982)		13.5	593	28	—	2
(1983)		13.5	822	29	38	3
184. Abandoned Agricultural Lands I	Tennessee	6.0	403	10	14	1
185. Abandoned Agricultural Lands II	Tennessee	6.0	427	10	14	1
186. Subirrigated Grassland	Nebraska	16.2	223	6	10	3
187. Subirrigated Native Hay	Nebraska	16.2	242	8	9	3
O. Residential						
188. Village	Ohio	19.4	314	50	12	1
P. Unclassified Late Reports						
189. Suburban Bird Sanctuary	New York	4.2	1445	13	26	1
190. Mixed Oak—Pine Forest I	Pennsylvania	6.0	808	45	31	7
191. Mixed Oak—Pine Forest II	Pennsylvania	11.1	561	55	38	7
192. Brushy Old Field with Hedgerows	Indiana	4.3	739	14	12	1
193. Corn Stubble with Hedgerow	Indiana	6.6	152	10	6	1

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194. Mixed Habitat Second-growth and Old Field	Indiana	11.0	674	22	25	1
195. Cultivated Field I	Iowa	10.6	23	1	10	2
196. Cultivated Field II	Iowa	18.7	27	2	10	1
197. Farmstead	Iowa	7.7	1236	9	30	2
198. Floodplain Tall Grass Prairie	Iowa	18.4	206	13	12	2
199. Tall Grass Prairie	Nebraska	8.5	188	14	9	1
200. Brome Seeded Dikes—Sewage Lagoons I	Kansas	25.9	131	6	8	1
201. Abandoned Field I	Pennsylvania	6.0	1077	46	21	6
202. Abandoned Field II	Pennsylvania	4.3	970	35	18	5
203. Burned Disturbed Coastal Scrub	California	8.1	377	42	14	1
204. Coastal Scrub	California	8.1	587	149	20	11
205. Disturbed Coastal Scrub A	California	4.7	511	173	21	11
206. Disturbed Coastal Scrub B	California	8.1	488	244	20	12
207. Shaded Ranch House on High Plains	New Mexico	0.8	2965	50	19	1
208. Bottomland Red Maple—White Ash-Pin Oak Forest	Pennsylvania	4.0	709	72	24	4
209. Upland Oak—Tulip-tree Forest	Pennsylvania	3.1	538	23	26	4
210. Oak-Hickory Forest—Second-growth	Missouri	7.8	484	22½	31	4
211. Douglas-fir—Western Hemlock Forest: Mount St. Helens Mudflow	Washington	9.1	76	18	4	2
212. Pinyon-Juniper Woodland	Utah	31.2	237	25	21	1



Killdeer with nest and eggs. Drawing by Ron Ridout.

1. 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, 17 intermittent years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AFN 19 590-591 (1965). **Coverage:** June 7, 9-10, 12, 17; 0700-2130 hrs. Total obs.-hours: 16. **Census:** Ovenbird, 15.5 (153, 62); Veery, 12 (119, 48); Red-eyed Vireo, 12; Com. Yellowthroat, 6.5 (64, 26); Tufted Titmouse, 5 (49, 20); Am. Redstart, 5; Scarlet Tanager, 4 (40, 16); Hairy Woodpecker, 3 (30, 12); Great Crested Flycatcher, 3; White-breasted Nuthatch, 3; Wood Thrush, 3; Rufous-sided Towhee, 3; Gray Catbird, 2.5; Black-and-white Warbler, 2.5; Downy Woodpecker, 2; N. Flicker, 2; Black-capped Chickadee, 2; Brown Creeper, 2; Blue-gray Gnatcatcher, 2; Am. Robin, 2; Louisiana Waterthrush, 2; Rose-breasted Grosbeak, 2; Song Sparrow, 2; Brown-headed Cowbird, 2; Wood Duck, 1; Ruffed Grouse, 1; E. Wood-Pewee, 1; Blue Jay, 1; Am. Crow, 1; Blue-winged Warbler, 1; Chestnut-sided Warbler, 1; Canada Warbler, 1; Broad-winged Hawk, 0.5; Barred Owl, 0.5; E. Phoebe, 0.5; House Wren, 0.5; N. Cardinal, 0.5; Great Horned Owl, +; Pileated Woodpecker, +; Eur. Starling, +; Com. Grackle, +. **Total:** 41 species; 110.5 territorial males ($1,092/\text{km}^2$, 442/100 acres). **Remarks:** The number of territorial males, up 19 from last year, was the highest it has ever been. No real surprises. Many species were simply a little more numerous than usual.—*ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.*

2. MIXED UPLAND FOREST. — **Location:** New York; Ulster Co., 1 mi SE of Mohonk Lake; 41°46'N, 74°09'W, Mohonk Lake Quadrangle, USGS. **Continuity:** Established 1975, 3 intermittent years. **Size:** 42.25 ha = 104.4 acres. **Description of Plot:** See AB 29 1083 (1975). Acreage of the 1975 census was reduced to a more workable size. **Coverage:** May 5, 7, 10, 12, 24-27; June 8, 14, 23; 0445-0800 hrs. **Total obs.-hours:** 38.5 **Census:** Ovenbird, 11.5 (27, 11); Great Crested Flycatcher, 10.5 (25, 10); Wood Thrush, 9 (21.5, 8.5); Black-and-white Warbler, 8.5 (20, 8); Louisiana Waterthrush, 7 (17, 7); Worm-eating Warbler, 6.5 (15, 6); E. Wood-Pewee, 6 (14, 6); Com. Yellowthroat, 6; Scarlet Tanager, 6; Red-eyed Vireo, 4 (9, 4); Black-capped Chickadee, 3.5 (8, 3); Blue Jay, 3 (7, 3); Com. Grackle, 3; Brown-headed Cowbird, 3; N. Flicker, 2.5; Rufous-sided Towhee, 2.5; Red-winged Blackbird, 2.5; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Gray Catbird, 2; Blue-winged Warbler, 2; Black-throated Green Warbler, 2; N. Oriole, 2; Ruffed Grouse, 1.5; House Wren, 1.5; Veery, 1.5; Rose-breasted Grosbeak, 1.5; Field Sparrow, 1.5; Mallard, 1; Black-billed Cuckoo, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Hairy Woodpecker, 1; E. Kingbird, 1; E. Phoebe, 1; Yellow-throated Vireo, 1; Nashville Warbler, 1; Black-throated Blue Warbler, 1; Blackburnian Warbler, 1; Am. Redstart, 1; N. Cardinal, 1; Indigo Bunting, 1;

Song Sparrow, 1; Brown Thrasher, 0.5; Eur. Starling, 0.5; Chipping Sparrow, 0.5; Wild Turkey, +; Ruby-throated Hummingbird, +; Belted Kingfisher, +; Am. Crow, +; E. Bluebird, +; Bobolink, +; Am. Goldfinch, +. **Total:** 54 species; 133 territories ($315/\text{km}^2$, 127/100 acres). **Visitors:** Great Blue Heron, Mallard, Solitary Sandpiper, Gray-checked Thrush, Tennessee Warbler, Bay-breasted Warbler. **Remarks:** Nests found: 1 E. Kingbird, 1 E. Phoebe, 1 White-breasted Nuthatch, 1 House Wren.—*STACEY WRIGHT and KARL BEARD, Mohonk Preserve, Inc., Mohonk Lake, New Paltz, NY 12561.*

3. RED MAPLE SWAMP. — **Location:** New Jersey; Morris Co., 1 mi E of Basking Ridge, Great Swamp N.W.R.; Chatham Quadrangle, USGS. Part of refuge tracts: 10ac, 23a, 10i, 23 and 100a. Wilderness Area. **Continuity:** New. **Size:** 5.58 ha = 13.8 acres (rectangular 600×1000 ft, surveyed with tape and compass). **Weather:** Average temp. for May was 54°F (28-80°). Total rainfall was 6.37 in. Average temp. for June was 66°F (38-93°). Total rainfall was 4.85 in. **Description of Plot:** Trees 4-in. diameter and over based on thirteen 0.1 acre plots, 298.44 trees/acre. Species comprising forest canopy (figures after each species give number trees/acre, relative density, relative dominance and frequency in that order). Red Maple, 156.1, 52.3, 49.9, 100; ash, 109.2, 36.6, 42.4, 100; birch, 13.0, 4.38, 3.01, 46.1; Am. Elm, 11.5, 3.87, 2.32, 53.8; Swamp White Oak, 8.46, 2.84, 2.34, 53.8; total basal area $72.45 \text{ ft}^2/\text{acre}$. Average canopy height 48.7 ft. Trees and shrubs 1-3 in. diameter based on thirteen 0.01 acre plots 355.3 stems/acre. Species comprising forest understory (figures after each species give number stems/acre, relative density, and frequency in that order). Sweet Pepperbush, 142.3, 40.0, 100; Red Maple, 60.8, 17.1, 92.3; S. Arrowwood, 58.5, 16.5, 69.2; serviceberry, 46.2, 12.9, 76.9; ash, 16.2, 4.5, 61.5; Am. Elm, 12.3, 3.5, 61.5; Spicebush, 10, 2.8, 7.6; birch, 5.4, 1.5, 38.4; Swamp White Oak, 3.1, 0.86, 15.3; Pin-Oak, 0.76, 0.21, 15.3. Groundcover based on 52, 1m² plots (figures after each species give ground coverage, in m²/acre and frequency in that order). Lizard's-tail, 7.34, 50; ferns, 6.76, 51.9; miscellaneous grasses, 4.88, 23; Arrow-Arum, 2.23, 17.3; Skunk-cabbage, 1.8, 15.4; S. Arrowwood, 0.53, 5.75; Sweet Pepperbush, 0.53, 7.67; Red Maple, 0.46, 1.90; ash, 0.38, 3.82; moss, 0.30, 3.82; Arrow-leaved Tear Thumb, 0.11, 3.82; Am. Elm, 0.07, 1.9. Total groundcover: 25.39 m²/40m². **Edge:** Bordered on all sides by similar habitat. **Topography:** Flat, drains E-W. **Elevation:** About 235 ft. **Coverage:** May 11, 17, 24; June 2, 8, 13, 15, 28; 0600-0720 hrs. Total obs.-hours: 8. **Census:** Veery, 5 (90, 36); Blue Jay, 4 (72, 29); Com. Yellowthroat, 3 (54, 22); Am. Robin, 2; Gray Catbird, 2; Blue-winged Warbler, 2; N. Oriole, 2; Tufted Titmouse, 1; Wood Thrush, 1; Yellow-throated Vireo, 1; N. Waterthrush, 1. **Total:** 11 species; 24 territorial males ($430/\text{km}^2$, 174/100 acres).

100 acres) **Visitors:** Great Blue Heron, Green-backed Heron, Canada Goose, Mallard, Wood Duck, Great Horned Owl, Barred Owl, Downy Woodpecker, E. Kingbird, Am. Crow, Black-capped Chickadee, N. Mockingbird, Cedar Waxwing, Eur. Starling, Red-eyed Vireo, Yellow Warbler, N. Cardinal, Swamp Sparrow, Com. Grackle.—*GRAHAM W. TAYLOR, Great Swamp National Wildlife Refuge, USDI, Fish and Wildlife Service, R.D. #1, Box 152, Basking Ridge, NJ 07920.*

BREEDING (1983) BIRDS OF THE BARRENS GROUSE MANAGEMENT AREA

Coverage of all habitat types was on Apr 25; May 2, 6, 13, 21, 26; June 3, 8, 17, 24 Total trips per habitat type was 10, all between sunrise and 1100 hrs. Mean minimum temperature was 43°F (range, 28° to 55°), and light rain occurred on 1 trip. A total of 27 species established territories in 1 or more of the 6 habitat types during spring 1983; this compares to 26 species in spring 1982. This study was supported by the Pennsylvania Agricultural Experiment Station and the Max McGraw Wildlife Foundation.—*RICHARD H. YAHNER, Forest Resources Lab., Penn. State Univ., University Park, PA 16802.*

4. ASPEN (CUT 1980-81). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°47'N, 78°58'W (patches 49B, 50B); 40°46'30"N, 77°57'30"W (patch 75B); 40°47'N, 77°57'W (patch 79B); Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 4.18 ha = 10.32 acres. **Description of Plot:** See AB 37:54 (1983). **Coverage:** Total obs.-hours: 6.5. **Census:** Field Sparrow, 3 (72, 29); Rufous-sided Towhee, 2; Com. Yellowthroat, 1.5; Indigo Bunting, 0.5. **Total:** 4 species; 7 territorial males ($168/\text{km}^2$, 68/100 acres). **Visitors:** Mallard, Downy Woodpecker, Am. Crow. **Remarks:** Nests found (2): Rufous-sided Towhee. Only 4.5 territorial males in 1982.

5. ASPEN (CUT 1976-77). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°47'N, 78°58'W (patches 50A, 51A); 40°46'30"N, 77°57'30"W (patch 76A); 40°47'N, 77°57'W (patch 80A); Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 4.02 ha = 9.93 acres. **Description of Plot:** See AB 37:54 (1983). **Coverage:** Total obs.-hours: 6.5. **Census:** Com. Yellowthroat, 4.5+ (112, 45); Golden-winged Warbler, 4 (100, 40); Field Sparrow, 3.5 (87, 35); Rufous-sided Towhee, 2+; Chestnut-sided Warbler, 2; Indigo Bunting, 2; Black-capped Chickadee, 1; Gray Catbird, 1; Black-and-white Warbler, 1; Yellow-breasted Chat, 1; Great Crested Flycatcher, +; Nashville Warbler, +; Am. Goldfinch, +; Chipping Sparrow, +; Brown-headed Cowbird, +. **Total:** 15 species; 22 territorial males ($547/\text{km}^2$, 222/100 acres). **Visitors:** Mourning Dove, N. Flicker, Blue Jay, Brown Thrasher. **Remarks:** Only 11 species in 1982.



Three of 6 habitat types studied at the Barrens Grouse Management Area (BBC #s 4-9). In the middle of these 2 clearcuts is a 1980-81 aspen clearcut. To the upper right is a portion of mature aspen stand. Photo/R. Yahner.

6. MIXED OAK (CUT 1976-77). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°47'N, 78°58'W (patches 42A, 43A); 40°46'30"N, 77°57'30"W (patch 84A); Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 3.33 ha = 8.23 acres. **Description of Plot:** See AB 37:54 (1983). **Coverage:** Total obs.-hours: 4.6. **Census:** Gray Catbird, 3 (90, 36); Com. Yellowthroat, 3; Chestnut-sided Warbler, 2; Rufous-sided Towhee, 2; Golden-winged Warbler, 1; Indigo Bunting, 0.5; Field Sparrow, 0.5; Red-eyed Vireo, +; Black-and-white Warbler, +. **Total:** 9 species; 12 territorial males (360/km², 146/100 acres). **Visitors:** Blue Jay, Black-capped Chickadee.

7. MATURE ASPEN (TREATED SECTOR). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°47'N, 78°58'W (patches 50C, 51D); 40°47'N, 77°57'W (patch 80D); Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 2.61 ha = 6.45 acres. **Description of Plot:** See AB 37:54 (1983). **Coverage:** Total obs.-hours: 5.3. **Census:** Rufous-sided Towhee, 3 (115, 47); Ovenbird, 2; Great Crested Flycatcher, 1.5; Black-and-white Warbler, 1.5; Black-billed Cuckoo, 1; Blue Jay, 1; Red-eyed Vireo, 1; Brown-headed Cowbird, 1; Downy Woodpecker, 0.5;

Black-capped Chickadee, 0.5; Golden-winged Warbler, 0.5; Indigo Bunting, 0.5; N. Flicker, +; House Wren, +; Nashville Warbler, +; Com. Yellowthroat, +. **Total:** 16 species; 14 territorial males (536/km², 217/100 acres). **Visitors:** Pileated Woodpecker, E. Wood-Pewee, White-breasted Nuthatch, Brown Thrasher, Chestnut-sided Warbler, Am. Redstart, Scarlet Tanager, Chipping Sparrow, Field Sparrow. **Remarks:** Only 9.5 territorial males in 1982.

8. MATURE MIXED OAK (TREATED SECTOR). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°47'N, 78°58'W (patches 41B, 42B); 40°46'30"N, 77°57'30"W (patch 83B); Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 3.24 ha = 8.0 acres. **Description of Plot:** See AB 37:55 (1983). **Coverage:** Total obs.-hours: 4.6. **Census:** Ovenbird, 2; Black-and-white Warbler, 1.5; Brown-headed Cowbird, 1; Rufous-sided Towhee, 1; Yellow-billed Cuckoo, 0.5; Downy Woodpecker, 0.5; E. Wood-Pewee, 0.5; Great Crested Flycatcher, 0.5; Blue Jay, 0.5; Scarlet Tanager, 0.5; Red-eyed Vireo, +; Nashville Warbler, +; Indigo Bunting, +; Field Sparrow, +. **Total:** 14 species; 8.5 territorial males (263/km², 106/100 acres). **Visitors:** Black-billed Cuckoo, Hairy Woodpecker, Pileated Woodpecker, E.

Phoebe, Am. Crow, Black-capped Chickadee, Tufted Titmouse, White-breasted Nuthatch, Blue-gray Gnatcatcher, Gray Catbird, Com. Yellowthroat, N. Cardinal, Rose-breasted Grosbeak. **Remarks:** Nest found (1): Yellow-billed Cuckoo.

9. MATURE ASPEN (UNTREATED SECTOR). — **Location:** Pennsylvania; Centre Co., State Game Lands 176, Barrens Grouse Management Area; 40°45'30"N, 77°58'W; Julian Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 3.00 ha = 7.41 acres. **Description of Plot:** See AB 37:55 (1983). **Coverage:** Total obs.-hours: 4.5. **Census:** Ovenbird, 1.5; Black-capped Chickadee, 1; Brown-headed Cowbird, 1; Great Crested Flycatcher, 0.5; Wood Thrush, 0.5; Black-and-white Warbler, 0.5; Ruffed Grouse, +; E. Wood-Pewee, +; Blue Jay, +; Chestnut-sided Warbler, +; Rufous-sided Towhee, +. **Total:** 11 species; 5 territorial males (167/km², 67/100 acres). **Visitors:** Mourning Dove, Yellow-billed Cuckoo, Downy Woodpecker, Red-eyed Vireo, Golden-winged Warbler, Nashville Warbler, Scarlet Tanager, Rose-breasted Grosbeak, Indigo Bunting, N. Oriole.

10. BIRCH-MAPLE-OAK FOREST. — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mi S of intersection of St.

Rte 228 and Kepple Rd on Todd Sanctuary, 40°44'N, 79°42'W, Freeport Quadrangle, USGS. **Continuity:** Established 1974; 7 intermittent years. **Size:** 9.07 ha = 22.4 acres. **Description of Plot:** See AB 28:992-993 (1974). **Weather:** Cold during late May and early June. Temp. 40-62°F. **Coverage:** May 25, 30; June 1, 3, 9, 12, 15, 18, 23, 25; July 1, 6, 0530-0830. **Census:** Red-eyed Vireo, 7 (77, 31); Acadian Flycatcher, 5.5 (61, 25); Wood Thrush, 4 (44, 18); Tufted Titmouse, 3 (33, 13); Cerulean Warbler, 2.5; N. Cardinal, 2.5, E. Wood-Pewee, 2; Black-capped Chickadee, 2; Blue-gray Gnatcatcher, 2; Ovenbird, 2, Hooded Warbler, 2; Scarlet Tanager, 2; Ruffed Grouse, 1.5; Ruby-throated Hummingbird, 1.5; Downy Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Blue Jay, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1, Rose-breasted Grosbeak, 1; Com. Grackle, 1, E. Screech-Owl, 0.5; Great Horned Owl, 0.5, E. Phoebe, 0.5; Solitary Vireo, 0.5; Louisiana Waterthrush, 0.5; Brown-headed Cowbird, 0.5 (female). **Total:** 29 species; 52.5 territorial males or females (579/km², 234/100 acres). **Visitors:** Broad-winged Hawk, Yellow-billed Cuckoo, Chimney Swift, Belted Kingfisher, Hairy Woodpecker, Pileated Woodpecker, Am. Crow, House Wren, Am. Robin, Cedar Waxwing, Blue-winged Warbler, Am. Goldfinch, Indigo Bunting, Chipping Sparrow, Field Sparrow. **Remarks:** Nests located: Downy Woodpecker, Acadian Flycatcher, Black-capped Chickadee, House Wren, Gray Catbird. This research was funded by a grant from the Audubon Society of Western Pennsylvania.—SARA ROSEN, 536 B St, LaVale, MD 21502.

11. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Coudersport, 2 mi NNW of intersection of Route 872 and Odin Hollow Road; 41°43'21"N, 78°5'57"W, Austin Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100 × 300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (106,407 total stems/ha): 76% of the total stems were Black Cherry, 9% Red Maple, 5% Yellow Birch; an additional 53,751 total stems/ha were *Rubus* spp.; ground cover 10%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** Ridgetop. **Elevation:** 665-670 m. **Weather:** Mild temperatures with below-average rainfall. **Coverage:** June 6, 9, 12, 20, 22, 24, 30; July 5; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 3.5 (117, 47); Willow Flycatcher, 2; Red-eyed Vireo, 2; Com. Yellowthroat, 2; Rufous-sided Towhee, 1.5, Mourning Warbler, 1; Rose-breasted Grosbeak, 1; Song Sparrow, 1; Am. Redstart, 0.5. **Total:** 9 species; 14.5 territorial males (484/km², 196/100 acres). **Visitors:** Ruffed Grouse, Black-billed Cuckoo, Scarlet Tanager, Brown-headed Cowbird. **Remarks:** Nests found: Rufous-sided Towhee. This project was supported by the Hammermill Pa-

per Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. —D. R. DESSECKER and R. H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

12. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Shaytown, 1.9 mi SE of only intersection in Shaytown (roads not named); 41°53'3"N, 78°9'2"W, Shinglehouse Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100 × 300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (51,943 total stems/ha): 46% of the total stems were Black Cherry, 14% Red Maple, 9% Yellow Birch, 9% White Ash, 7% Am. Beech; an additional 21,024 total stems/ha were *Rubus* spp.; ground cover 19%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** Ridgetop. **Elevation:** 710-735 m. **Weather:** Mild temperatures with below-average rainfall. **Coverage:** June 8, 11, 14, 21, 23, 29; July 1, 8; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 3 (100, 40); Gray Catbird, 2; Mourning Warbler, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Song Sparrow, 2; N. Mockingbird, 1; Com. Yellowthroat, 1; Indigo Bunting, 1; Am. Robin, 0.5; Red-eyed Vireo, 0.5; Scarlet Tanager, 0.5. **Total:** 12 species; 17.5 territorial males (584/km², 236/100 acres). **Visitors:** Ruffed Grouse, Ruby-throated Hummingbird, Am. Redstart. **Remarks:** This project was supported by the Hammermill Paper Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. D. R. DESSECKER and R. H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

13. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Shaytown, 1.8 mi ESE of only intersection in Shaytown (roads not named); 41°53'32"N, 78°8'38"W, Shinglehouse Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100 × 300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (73,348 total stems/ha): 31% of the total stems were Black Cherry, 25% Red Maple, 10% Am. Beech, 8% White Ash, 7% Pin-Cherry, 6% Yellow Birch; an additional 47,139 total stems/ha were *Rubus* spp.; ground cover 18%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** Ridgetop. **Elevation:** 710-730 m. **Weather:** Mild temperatures with below-average rainfall. **Coverage:** June 7, 10, 13, 21, 23, 29; July 1, 8; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 6.5 (217, 88); Mourning Warbler, 3.5 (117, 47); Rufous-sided Towhee, 3 (100, 40); Com. Yellowthroat, 2.5; Rose-breasted Grosbeak, 2.5;

Song Sparrow, 2.5, Gray Catbird, 2, Blue-winged Warbler, 2, Willow Flycatcher, 1, Golden-winged Warbler, 1; Dark-eyed Junco, 1. **Total:** 11 species; 27.5 territorial males (917/km², 371/100 acres). **Visitors:** Ruffed Grouse, Black-billed Cuckoo, Yellow-billed Cuckoo, Downy Woodpecker, Hairy Woodpecker, Great Crested Flycatcher, Black-capped Chickadee, Am. Redstart, Scarlet Tanager, Indigo Bunting, Brown-headed Cowbird. **Remarks:** Blue-winged and Golden-winged warbler territories were adjacent to each other. This project was supported by the Hammermill Paper Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. D. R. DESSECKER and R. H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

14. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Shaytown, 1.6 mi SSW of only intersection in Shaytown (roads not named); 41°53'N, 78°10'53"W, Shinglehouse Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100 × 300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (54,464 total stems/ha): 32% of the total stems were White Ash, 24% Black Cherry, 15% Red Maple, 11% Pin-Cherry, 8% Am. Beech; an additional 49,089 total stems/ha were *Rubus* spp.; ground cover 15%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** 10°N slope, 60 m from ridgetop. **Elevation:** 670-680 m. **Weather:** Mild temperatures with below average rainfall. **Coverage:** June 8, 11, 14, 21, 23, 29; July 1, 8; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 3 (100, 40); Mourning Warbler, 3; Com. Yellowthroat, 3; Gray Catbird, 2; Song Sparrow, 2; Rufous-sided Towhee, 1; Rose-breasted Grosbeak, 0.5; Indigo Bunting, 0.5. **Total:** 8 species; 15 territorial males (500/km², 202/100 acres). **Visitors:** Yellow-bellied Sapsucker, E. Wood-Pewee, Black-capped Chickadee, Am. Redstart, Scarlet Tanager. **Remarks:** This project was supported by the Hammermill Paper Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. D. R. DESSECKER and R. H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

15. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Shaytown, 1.8 mi ESE of only intersection of Route 872 and Odin Hollow Road, 41°42'11"N, 78°5'21"W, Austin Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100 × 300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (94,134 total stems/ha)

74% of the total stems were Black Cherry, 13% Am. Beech, and 7% Red Maple; an additional 79,008 total stems/ha were *Rubus* spp.; ground cover 18%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** Ridgetop. **Elevation:** 700-710 m. **Weather:** Mild temperatures with below-average rainfall. **Coverage:** June 7, 10, 13, 20, 22, 24, 30; July 5; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 4 (133, 54); Mourning Warbler, 4; Song Sparrow, 3 (100, 40); Willow Flycatcher, 2; Com. Yellowthroat, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Gray Catbird, 1; Red-eyed Vireo, 1; Blue-winged Warbler, 1; Black-and-white Warbler, 1; Indigo Bunting, 1; Dark-eyed Junco, 1. **Total:** 13 species; 25 territorial males ($834/\text{km}^2$, 337/100 acres). **Visitors:** Black-billed and Yellow-billed cuckoos, Cedar Waxwing. **Remarks:** This project was supported by the Hammermill Paper Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. *D. R. DESSECKER and R.H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.*

16. BLACK CHERRY-MAPLE CLEAR-CUT. — **Location:** Pennsylvania; Potter Co., Coudersport, 2.25 mi NW of intersection of Route 872 and Odin Hollow Road; $41^\circ 43' 31''\text{N}$, $78^\circ 6' 27''\text{W}$, Austin Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (100×300 m, measured). **Description of Plot:** A quantitative analysis of the vegetation based on 20 0.001-ha plots gave the following results: Trees 7.6 cm dbh and over, 0. Timber regeneration (35,865 total stems/ha): 31% of the total stems were Black Cherry, 29% Red Maple, 14% Am. Beech, 9% Yellow Birch, and 8% Pin-Cherry; an additional 85,525 total stems/ha were *Rubus* spp.; ground cover 24%. **Edge:** Bordered on all sides by stands of similar composition, all approximately 40-80 years old. **Topography:** Ridgetop. **Elevation:** 677 m. **Weather:** Mild temperatures with below-average rainfall. **Coverage:** June 6, 9, 12, 20, 22, 24, 30; July 5; 0500-1000 hrs. Total obs.-hours: 16. **Census:** Chestnut-sided Warbler, 3 (100, 40); Mourning Warbler, 2; Com. Yellowthroat, 2; Canada Warbler, 1.5; Rufous-sided Towhee, 1.5; Gray Catbird, 1; Red-eyed Vireo, 1; Rose-breasted Grosbeak, 1; Dark-eyed Junco, 1; Am. Redstart, 0.5. **Total:** 10 species; 14.5 territorial males ($484/\text{km}^2$, 196/100 acres). **Visitors:** Ruffed Grouse, Yellow-billed Cuckoo, Blue Jay, Am. Robin. **Remarks:** Nests found (3): Chestnut-sided Warbler, 2, Rufous-sided Towhee. This project was supported by the Hammermill Paper Company, the Pennsylvania Agricultural Experiment Station, and the Max McGraw Wildlife Foundation. *D. R. DESSECKER and R. H. YAHNER, Forest Resources Laboratory, School of Forest Resources, Pa. State Univ., University Park, PA 16802.*

17. OAK-MAPLE RIDGE-TOP FOREST. — **Location:** Pennsylvania; Berks Co.,

Hawk Mountain Sanctuary, S slope of Hemlock Heights; $40^\circ 44' \text{N}$, $75^\circ 50' \text{W}$, New Ringgold Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 19.3 ha = 47.8 acres. **Description of Plot:** See AB 37:55 (1983). **Weather:** Sunny and clear on 4 trips, overcast on 2. Temp. range 1.1-20° C, averaging 9.8°. **Coverage:** May 2, 10, 19; June 2, 9, 16; 0500-0930 hrs. Total obs.-hours: 12. **Census:** Ovenbird, 4 (21, 8); Blue Jay, 3 (16, 6); Com. Yellowthroat, 3; Rufous-sided Towhee, 3; Mourning Dove, 2; Black-capped Chickadee, 2; Wood Thrush, 2; Brown-headed Cowbird, 2; N. Flicker, 1; Scarlet Tanager, 1; Great Crested Flycatcher, +. **Total:** 11 species; 23 territorial males ($119/\text{km}^2$, 48/100 acres). **Visitors:** Ruffed Grouse, Yellow-billed Cuckoo, Downy Woodpecker, Hairy Woodpecker, E. Wood-Pewee, Tufted Titmouse, White-breasted Nuthatch, Brown Creeper, Red-eyed Vireo, Black-and-white Warbler, Com. Grackle. **Remarks:** The density of breeding birds remained relatively unchanged from last year although the diversity of birds was lower. Mixed flocks of grackles and jays were noted foraging together on the ground. A towhee nest was located. Gypsy Moth infestation this year was practically nil.—*BRAD ANDRES, SETH BENZ, STAN SENNER, Hawk Mountain Sanctuary, Route 2, Kempton, PA 19529.*

18. OAK-MAPLE SLOPE FOREST. — **Location:** Pennsylvania; Berks Co., Hawk Mountain Sanctuary, N side of the River of Rocks, $40^\circ 44' \text{N}$, $75^\circ 50' \text{W}$, New Ringgold Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 16.9 ha = 41.8 acres. **Description of Plot:** See AB 37:55 (1983). **Weather:** Sunny and clear on 4 trips, overcast on 2. Temp. range, 1.1-20° C, averaging 11.1°. **Coverage:** May 2, 10, 19; June 2, 16, 24; 0500-1000 hrs, EST. Total obs.-hours: 11. **Census:** Ovenbird, 6 (35, 14); Downy Woodpecker, 2; N. Flicker, 2; Tufted Titmouse, 2; Mourning Dove, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Red-eyed Vireo, 1; Blue-gray Gnatcatcher, 1; Black-throated Green Warbler, 1; Black-and-white Warbler, 1; Com. Yellowthroat, 1; Scarlet Tanager, 1; Brown-headed Cowbird, 1. **Total:** 16 species; 24 territorial males ($142/\text{km}^2$, 57/100 acres). **Visitors:** Ruffed Grouse, Black-billed and Yellow-billed cuckoos, Wood Thrush, Am. Robin, Worm-eating Warbler, N. Cardinal. **Remarks:** Overall decrease in the density and diversity of breeders from last year. Wood Thrushes down from 6 to 0; some birds seemed to have moved outside the perimeter.—*BRAD ANDRES, SETH BENZ, STAN SENNER, Hawk Mountain Sanctuary, Route 2, Kempton, PA 19529.*

19. SUGAR MAPLE-MIXED HARDWOOD FOREST. — **Location:** Pennsylvania; Washington Co., 1.5 mi SE of intersection of Routes 79 and 40; $40^\circ 08' \text{N}$, $80^\circ 11' \text{W}$, Washington East Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 9.74 ha = 24.07 acres. **Description of Plot:** See AB 37:55-56 (1983). **Weather:** Considerably cooler and wetter than May 1982. Rainfall for



BBC 19. Washington Co., Pa. Sugar Maple Mixed Hardwood Forest. Photo/R. Ickes.

month, 3.25 in. Temp. 37-64°F. **Coverage:** May 14, 17-18, 20, 24-25, 28, 31; 0545-0915, EDT. Total obs.-hours: 28. **Census:** Red-eyed Vireo, 13 (133, 54); Acadian Flycatcher, 10 (103, 42); Wood Thrush, 5 (56, 23); Scarlet Tanager, 5 (51, 21); Tufted Titmouse, 4 (41, 17); Brown-headed Cowbird, 4 (females); Kentucky Warbler, 3.5 (36, 15); Cerulean Warbler, 3 (31, 12); N. Cardinal, 3; White-breasted Nuthatch, 2.5; Red-bellied Woodpecker, 2; E. Wood-Pewee, 2; Blue-gray Gnatcatcher, 2; Yellow-billed Cuckoo, 1.5; Downy Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Pileated Woodpecker, 1; Blue Jay, 1; Am. Crow, 1; Am. Robin, 1; Gray Catbird, 1; Louisiana Waterthrush, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1; Cooper's Hawk, 0.5; Carolina Chickadee, 0.5; Yellow-throated Vireo, 0.5; Ruby-throated Hummingbird, +. **Total:** 28 species; 73.5 territorial males or females ($755/\text{km}^2$, 305/100 acres). **Visitors:** N. Flicker, Am. Goldfinch. **Remarks:** Courtship was observed in the Red-eyed Vireo, Scarlet Tanager, Indigo Bunting, and Brown-headed Cowbird. Nest building was seen in the Am. Robin and Rufous-sided Towhee. Compared with 1982 the Acadian Flycatcher and Scarlet Tanager increased by more than 1 territorial male, whereas Carolina Chickadee and Cerulean Warbler decreased by more than 1. New breeding species were Cooper's Hawk, Am. Robin, and Yellow-throated Vireo. Not observed this year were Ruffed Grouse, Black-billed Cuckoo, and Com. Grackle. Numbers of territories for the other species remained fairly constant. Net increase in territorial males was 4. Thanks to Ernest Abernathy for the use of his property.—*ROYA. ICKES, Biology Dept., Washington & Jefferson College, Washington, PA 15301.*

20. UPLAND OAK-MAPLE FOREST (SPRAYED). — **Location:** Pennsylvania; Centre Co., Moshannon State Forest; 2.5 mi E of intersection of Route 504 and Julian Pike; $40^\circ 54' \text{N}$, $78^\circ 01' \text{W}$, Black Moshannon Quadrangle, USGS. **Continuity:** New. **Size:** 20 ha = 49.42 acres (two 100×1000 m parallel areas separated by 100 m, measured). **Description of Plot:** The dominant canopy tree is Chestnut Oak. Most prominent in the understory is Mountain-Laurel. The ground cover is primarily Mountain-Laurel and blueberry. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1-acre circular samples, 511/acre; total basal area $154 \text{ ft}^2/\text{acre}$. Species

comprising 90% of the total number of trees Red Maple, 164, 32, 21, 100; Chestnut Oak, 132, 26, 38, 33; dead trees, 122, 24, 19, 100; N. Red Oak, 47, 9, 17, 100. Trees by diameter size class: A (3-6 in.) 264, 52, 34.4, 22; B (6-9 in.) 157, 31, 47.1, 31; C (9-15 in.) 90, 17, 72.1, 47. Shrub stems/acre 19,358; ground cover 64%; canopy cover 75%; average canopy height 55 ft (range 30-72). **Edge:** Bordered on all sides by similar forest. **Topography:** Relatively hilly. **Elevation:** 2100 ft. **Weather:** Generally favorable with sufficient rainfall; average minimum temperature 58°F (range 45°-69°). **Coverage:** May 25, 28; June 1-3, 6-8, 21-27, 29; between sunrise and 1030. Total obs.-hours: 32. **Census:** Com. Yellowthroat, 10 (50, 20); Ovenbird, 9 (45, 18); Rufous-sided Towhee, 8 (40, 16); Red-eyed Vireo, 7 (35, 14); E. Wood-Pewee, 5 (25, 10); Black-and-white Warbler, 5; Worm-eating Warbler, 5; Black-capped Chickadee, 4 (20, 8); Chestnut-sided Warbler, 3 (15, 6); Am. Redstart, 3; White-breasted Nuthatch, 2.5; Great Crested Flycatcher, 2; Brown-headed Cowbird, 2; Downy Woodpecker, 1; Pileated Woodpecker, 1; Blue Jay, 1; Tufted Titmouse, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Am. Crow, +; Com. Raven, +. **Total:** 21 species; 71.5 territorial males (358/km², 145/100 acres). **Visitors:** Black-billed Cuckoo, Yellow-billed Cuckoo, Hairy Woodpecker, Blue-gray Gnatcatcher, Wood Thrush, Black-throated Blue Warbler, Field Sparrow. **Remarks:** Nest found: Com. Raven. This study was supported by a grant-in-aid to E. Alan Cameron, Dept. of Entomology, Pa. State Univ. from the Agricultural Chemicals Division, Mobay Chemical Company.—JENNIFER L. QUINN, RICHARD N. YAHNER, and JEFFREY W. GRIMM, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

21. UPLAND OAK-MAPLE FOREST (UNSPRAYED).—**Location:** Pennsylvania; Centre Co., Moshannon State Forest, 1.5 mi E of intersection of Route 504 and Julian Pike; 40°54'N, 78°02'W, Black Moshannon Quadrangle, USGS. **Continuity:** New. **Size:** 20 ha = 49.42 acres (two 100 × 1000 m parallel areas separated by 100 m, measured). **Description of Plot:** The dominant canopy trees are Chestnut Oak, Red Maple, and N. Red Oak. Most prominent in the understory are Mountain-Laurel and Sassafras. The ground cover is primarily Mountain-Laurel and blueberry. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1-acre circular samples, 442/acre; total basal area 159 ft²/acre. Species comprising 90% of the total number of trees: Red Maple, 170, 40, 14, 100; dead trees, 112, 26, 28, 100; Chestnut Oak, 61, 14, 27, 100; N. Red Oak, 46, 11, 20, 83. Trees by diameter size class: A (3-6 in.) 211, 50, 8, 2, 5; B (6-9 in.) 86, 20, 27.1, 17; C (9-15 in.) 122, 8, 114.7, 72; D (15-21 in.) 5, 2, 9, 0, 6. Shrub stems/acre 19,550; ground cover 71%; canopy cover 73%; average canopy height 51 ft (range 42-66). **Edge:** Bordered on

3 sides by similar forest, on S side by dirt road. **Topography:** Relatively hilly. **Elevation:** 2100-2300 ft. **Weather:** Generally favorable with sufficient rainfall; average minimum temp. 57°F (range 45°-69°). **Coverage:** May 25, 28; June 1-3, 6-8, 21-27, 29; between sunrise and 1030. Total obs.-hours: 32. **Census:** Com. Yellowthroat, 10 (50, 20); Ovenbird, 9 (45, 18); Rufous-sided Towhee, 8 (40, 16); Red-eyed Vireo, 7 (35, 14); E. Wood-Pewee, 5 (25, 10); Black-and-white Warbler, 5; Worm-eating Warbler, 5; Black-capped Chickadee, 4 (20, 8); Chestnut-sided Warbler, 3 (15, 6); Am. Redstart, 3; White-breasted Nuthatch, 2.5; Great Crested Flycatcher, 2; Brown-headed Cowbird, 2; Downy Woodpecker, 1; Pileated Woodpecker, 1; Blue Jay, 1; Tufted Titmouse, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Am. Crow, +; Com. Raven, +. **Total:** 21 species; 71.5 territorial males (358/km², 145/100 acres). **Visitors:** Black-billed Cuckoo, Yellow-billed Cuckoo, Hairy Woodpecker, Blue-gray Gnatcatcher, Wood Thrush, Black-throated Blue Warbler, Field Sparrow. **Remarks:** Nest found: Com. Raven. This study was supported by a grant-in-aid to E. Alan Cameron, Dept. of Entomology, Pa. State Univ. from the Agricultural Chemicals Division, Mobay Chemical Company.—JENNIFER L. QUINN, RICHARD N. YAHNER, and JEFFREY W. GRIMM, School of Forest Resources, Pa. State Univ., University Park, PA 16802.

22. MATURE DECIDUOUS FLOOD-PLAIN FOREST.—**Location:** Maryland; Montgomery Co., Glen Echo, 2.5 mi NW of D.C., between the C. & O. Canal and the Potomac River; 38°58'N, 77°8'30"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:** An exceptionally cool, wet spring. Average temp. on trips: 64°F. **Coverage:** Apr. 16, 23, 30; May 1, 6, 14-15, 21-22; June 4-5, 11; 0540-1045, EST. Total obs.-hours: 29. **Census:** Eur. Starling, 8 (105, 43); Carolina Chickadee, 5 (66, 27); Blue-gray Gnatcatcher, 5; Red-eyed Vireo, 5; Acadian Flycatcher, 4.5 (59, 24); N. Cardinal, 4.5; Downy Woodpecker, 4 (53, 21); Tufted Titmouse, 4; Wood Duck, 3 (40, 16); Red-bellied Woodpecker, 3; N. Parula, 3; N. Flicker, 2; Carolina Wren, 2; Prothonotary Warbler, 1.5; Barred Owl, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; E. Bluebird, 1; Yellow-throated Warbler, 1; Indigo Bunting, 1; Song Sparrow, 1; Brown-headed Cowbird, 1. **Total:** 25 species; 65.5 territorial males or females (863/km², 349/100 acres). **Visitors:** Hairy Woodpecker, Blue Jay, White-breasted Nuthatch, Com. Yellowthroat. **Remarks:** Nests located: Eur. Starling, 8; Red-bellied Woodpecker, 2; 1 each for Downy Woodpecker, N. Flicker, Pileated Woodpecker. Redstart failed to breed for first time, continuing the decrease in neotropical migrant breeders. Brown Creeper did not breed for first time since 1974 when it first appeared on the island. Bluebird bred for the

first time.—J. R. GAUTHHEY, 6603 Reynard Drive, Springfield, VA 22152

23. MIXED HARDWOOD FOREST.—**Location:** Maryland; Calvert Co., NW of Plum Pt. and 1 mi inland from Chesapeake Bay on Tobacco Road between Routes 263 and 261. **Continuity:** Established 1960; 19 intermittent years. **Size:** 11.3 ha = 28 acres. **Description of Plot:** See AFN 13:333 (1959). **Weather:** 15 trips were made on clear days. Temp. 53-88°F. The creek flowed throughout the census and the low area remained wet although the days were mostly dry and very warm, especially in July. **Coverage:** Apr. 27; May 2, 7, 13, 17, 27, 31; June 5, 10, 12-14, 21-22, 27, 30; July 5, 11, 18, 25; Aug. 2; 0542-1020, EST. Total obs.-hours: 27. **Census:** Red-eyed Vireo, 16 (141, 57); Hooded Warbler, 15 (132, 54); White-eyed Vireo, 11 (97, 39); N. Cardinal, 11; Rufous-sided Towhee, 9 (79, 32); Mourning Dove, 7 (62, 25); Wood Thrush, 6 (53, 21); Acadian Flycatcher, 5 (44, 18); Tufted Titmouse, 5; Am. Crow, 4 (35, 14); Carolina Wren, 4; Blue-gray Gnatcatcher, 4; Kentucky Warbler, 4; Com. Yellowthroat, 4; Yellow-billed Cuckoo, 3 (26, 11); Red-bellied Woodpecker, 3; Pine Warbler, 3; Ovenbird, 3; Yellow-breasted Chat, 3; Indigo Bunting, 3; Am. Woodcock, 2; Downy Woodpecker, 2; Blue Jay, 2; Carolina Chickadee, 2; Prairie Warbler, 2; Worm-eating Warbler, 2; Brown-headed Cowbird, 2; Summer Tanager, 2; Scarlet Tanager, 2; N. Bobwhite, 1; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; E. Wood-Pewee, 1; Gray Catbird, 1; Brown Thrasher, 1; Yellow-throated Vireo, 1; Warbling Vireo, 1; Am. Redstart, 1; Louisiana Waterthrush, 1; Com. Grackle, 1; Barred Owl, +; N. Flicker, +; Pileated Woodpecker, +; E. Kingbird, +; Am. Robin, +; Eur. Starling, +; N. Parula, +; Black-and-white Warbler, +. **Total:** 49 species; 152 territorial males (1341/km², 543/100 acres). **Remarks:** The 49 species on territory were a marked increase over last year's 31, and the previous year's 25. However, the 19-year average remains at 35. The 152 territorial males were a slight increase over last year's 147. The average is now 200, a further reduction of last year's 203. The average for birds per 100 acres is now 716. The Red-eyed Vireo was again the most numerous species; but it was reduced from last year's 22 to 16 territories. The Hooded Warbler was second; and it increased to 15 territories from last year's 7. The N. Cardinal fell off from second last year to third; and it tied the White-eyed Vireo with 11 territories. The Rufous-sided Towhee was next; and it showed a loss from last year. Other species showing reductions were Wood Thrush, Com. Yellowthroat, and Yellow-breasted Chat. Other species showing increases were Mourning Dove, Yellow-billed Cuckoo, E. Wood-Pewee (absent last year), Acadian Flycatcher, Am. Crow, Carolina Wren, Blue-gray Gnatcatcher, Pine Warbler, Ovenbird, and Brown-headed Cowbird. The Warbling Vireo occurred for the first time as did the Black-and-white Warbler, the former being on territory.—JOHN H. FALES, 2809 Ridge Road, Neeld Estate, Huntingdon, MD 20639.



BBC 24, Glover-Archbold Park, Washington, D.C. Mixed Upland Habitat. Photo/S. Briggs.

24. MIXED UPLAND HABITAT. —
Location: District of Columbia, the central third of Glover-Archbold Park, 38°55'N. 77°05'W., Washington W Quadrangle, DC-MD-VA 7.5 minute series, USGS. **Continuity:** Established 1960; 24 consecutive years. **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AFN 14:502-503 (1960). **Weather:** Temp. 55-85°F, average 70°. Of 12 trips, 7 were clear, 3 cloudy, 2 had heavy rain, with wind calm on all but 1, with 10-15 mph. **Coverage:** Apr. 23; May 7-8, 11, 25-26; June 2, 5, 18, 25; July 4, 10; 0711-2100. Total obs.-hours 23.83. **Census:** Gray Catbird, 19 (134, 54); Veery, 17 (120, 49); N. Cardinal, 17; Carolina Wren, 10 (71, 29); Tufted Titmouse, 8.5 (60, 24); Blue Jay, 8 (56, 23); Carolina Chickadee, 7.5 (53, 21); Wood Thrush, 7 (49, 20); Red-eyed Vireo, 5.5 (39, 16); Red-bellied Woodpecker, 4 (28, 11); Am. Crow, 3 (21, 9); Rufous-sided Towhee, 2.5; Downy Woodpecker, 1.5; White-breasted Nuthatch, 1.5; N. Flicker, 1; Pileated Woodpecker, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Com. Grackle, 1; Yellow-throated Vireo, 0.5; Hairy Woodpecker, +; Eur. Starling, +. **Total:** 22 species; 117.5 territorial males (830/km², 336/100 acres). **Visitors:** Broad-winged

Hawk, Rock Dove, Mourning Dove, E. Screech-Owl, Chimney Swift, Acadian Flycatcher, Great Crested Flycatcher, House Wren, Am. Robin, N. Mockingbird, House Sparrow, Song Sparrow, House Finch, Am. Goldfinch. **Remarks:** The Kentucky Warbler returned as a breeding species for the first time since 1971. In the early years of the census, 6 warbler species nested regularly, with a total average of 33 pairs: Am. Redstart, Com. Yellowthroat, Hooded, N. Parula, Kentucky, and Ovenbird. All declined rapidly after 1964, and but for a redstart + in 1977, all but the Ovenbird were gone by 1974. Ovenbirds were minimally present through 1982, but missing this year. The Kentucky, which returned to the territory most favored in its abundant years, is the first encouraging record. The vireos and flycatchers, lost since the decline began in 1963, are still gone, but Acadian and Great Crested flycatchers were visitors. Last year the ratio of Veeries to Wood Thrushes returned to its original balance, after many years of more Veeries and very few Wood Thrushes, and this continues. Loss of all of these neotropical migrants is consistent with changes in wintering and migratory areas, without apparent change in the plot. Unusual-

ly low coverage this year may account for the somewhat lower total numbers and species count. Some seen as visitors might have been shown residents with more observations.—
SHIRLEY A. BRIGGS (compiler), JAMES DEANE, OLIVE HOLBROOK, G. T. and SUSAN HUNT, 7605 Honeywell Lane, Bethesda, MD 20814.

25. CHERRY-LOCUST-OAK FOREST. — **Location:** West Virginia; Hancock Co.; 3 mi NNW of New Cumberland; 40°32'57"N, 80°34'46"W, East Liverpool South Quadrangle, USGS, extending NE. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** Former pasture field acquired by the state of West Virginia for a park in 1945. The dominant canopy trees are Black Cherry and Black Locust. Most prominent in the understory are hawthorn and blackberry. The ground cover is primarily Heart-leaved Aster and Virginia Creeper. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre samples, 171/acre; total basal area 45 ft²/acre. Species comprising 95% of the total number of trees: Black Cherry, 83, 52, 52, 83; Black Locust, 7, 4, 12, 17; N. Red Oak, 10, 6, 7, 17; Red Maple, 25, 15, 6, 50; dead trees, 27, 16, 18, 67; a crabapple (*Pyrus coronaria*), 12, 7, 2, 33. Trees by diameter size class: A (3-6 in.) 123, 72, 12, 27; B (6-9 in.) 18, 10, 5, 13; C (9-15 in.) 27, 16, 21, 47; D (15-21 in.) 13, 2, 6, 13. Shrub stems/acre 3283; ground cover 65%; canopy cover 82%; average canopy height 40 ft (range 20-67). **Edge:** Continuation of same vegetation. **Topography:** Center line level along ridge with sides as much as 25 ft below. **Elevation:** 1200 ft. **Weather:** Cloudy and cool with light breeze at times. **Coverage:** May 26-30; between dawn and 0740 or 1840-1945 hrs, EDT. Total obs.-hours: 15. **Census:** Red-eyed Vireo, 8 (132, 53); Rufous-sided Towhee, 3 (49, 20); Hooded Warbler, 2.5; Indigo Bunting, 2.5; Acadian Flycatcher, 2; Field Sparrow, 2; Wood Thrush, 1.5; Cerulean Warbler, 1.5; Gray Catbird, 1; N. Cardinal, 1; Prairie Warbler, 0.5; Mourning Dove, +; Blue-gray Gnatcatcher, +; Am. Robin, +; Blue-winged Warbler, +; Black-and-white Warbler, +; Scarlet Tanager, +. **Total:** 17 species; 25.5 territorial males (420/km², 170/100 acres). **Visitors:** Blue Jay, Black-capped Chickadee, Tufted Titmouse and Brown-headed Cowbird.—**DOROTHY BROEMSEN, MARY FORD, GEORGE KOCH, NEVADA LAITSCH and VIRGINIA JOHNSON (compiler).** Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.

26. CHERRY-TULIP-TREE-LOCUST. — **Location:** West Virginia; Hancock Co., 4 mi N of New Cumberland; 40°32'07"N, 80°34'45"W, East Liverpool Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are Black Cherry, Tulip-tree and Black Locust. Most prominent in the understory are

blackberry and seedlings of the canopy trees. The groundcover is primarily Pale Touch-me-not (*Impatiens pallida*) and May-apple. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 306/acre. Species comprising 96% of the total number of trees: Black Cherry, 94, 30, 37, 100; Tulip-tree, 52, 17, 27, 50; Black Locust, 64, 20, 24, 83; Red Maple, 17, 17, 8, 50. Trees by diameter size class: A (3-6 in.) 135, 44, 12, 9; B (6-9 in.) 97, 31, 29, 23; C (9-15 in.) 53, 17, 42, 35; D (15-21 in.) 20, 6, 36, 29; E (21-27 in.) 2, 1, 5, 4. Shrub stems/acre 1283, ground cover 79%; canopy cover 70%; average canopy height 76 ft (range 52-98). **Edge:** Bounded by like habitat. **Topography:** East slope of hillside in Tomlinson Run State Park, centerline is canopied access road to picnic area, pointing roughly N-S. **Elevation:** 1060-1200 ft. **Weather:** Cloudy; rain 2 evenings. **Coverage:** May 26-30; between dawn and 0740 hours or 1840-2015 hrs, EDT. Total party-hours: 10. **Census:** Red-eyed Vireo, 6 (99, 40); Indigo Bunting, 4.5 (74, 30); House Wren, 4 (66, 27); Acadian Flycatcher, 3 (49, 20); Hooded Warbler, 3; N. Cardinal, 3; Rufous-sided Towhee, 3; E. Wood-Pewee, 2; Blue-gray Gnatcatcher, 2; Wood Thrush, 2; Kentucky Warbler, 2; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Cerulean Warbler, 1; Black-billed Cuckoo, +; Chimney Swift, +; Red-bellied Woodpecker, +; Downy Woodpecker, +; Hairy Woodpecker, +; Great Crested Flycatcher, +; Am. Crow, +; Tufted Titmouse, +; Am. Robin, +; Worm-eating Warbler, +; Scarlet Tanager, +. **Total:** 25 species; 37.5 territorial males (618/km², 250/100 acres). **Visitors:** Ruby-throated Hummingbird, N. Flicker, Cedar Waxwing, Yellow-throated Vireo, Canada Warbler, Yellow-breasted Chat, Chipping Sparrow, Am. Goldfinch. **Remarks:** Nests found (2): Hooded Warbler and Red-eyed Vireo. Disposition of the White-breasted Nuthatch and Tufted Titmouse suggest that they had hatched their broods.—JUANITA DELANCEY, JOANNE and PHILIP GRAHAM, E E HUTTON, JR., NEVADA LAITSCH, GLEN PHILLIPS (compiler) and BILL SMITH, Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.

27. MAPLE-BEECH FOREST. — **Location:** West Virginia; Randolph Co.; 1.5 mi N of Gaudineer knob; 38°38'01"N, 79°51'08"W. Wildell Quadrangle, USGS. **Continuity:** Established 1947; 6 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 27:963 (1973) (Young Northern Hardwood Forest). The dominant canopy trees are Am. Beech and Red Maple. Most prominent in the understory are Striped Maple and dewberry. The ground cover is primarily ferns and Common Wood-Sorrel. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 492/acre, total basal area 101 ft²/acre. Species comprising 95% of the total number of trees: Am. Beech 177, 36, 10, 100; Red Maple 106, 22, 57, 100; dead trees 97, 20, 7, 100; Yellow

Birch 58, 11, 6, 100; Black Cherry 33, 7, 14, 83. Trees by diameter size class: A (3-6 in.) 260, 53, 9.4, 9; B (6-9 in.) 125, 25, 13.5, 13; C (9-15 in.) 85, 17, 24, 24; D (15-21 in.) 12, 2, 40, 40; E (21-27 in.) 7, 1, 7.4, 7; F (27-33 in.) 3, 1, 6, 6. Shrub stems/acre 2558; ground cover 43%; canopy cover 86%; canopy height 68 ft (range 49-103). **Edge:** Bordered on all sides by similar habitat. **Topography:** The ridge slopes E-W toward Cheat River. **Elevation:** 4100-4200 ft. **Weather:** 16 trips sunny, 4 with rain. **Coverage:** June 5-9; between dawn and 0740 or 1930-2105 hrs, EDT. Total party-hours: 34. **Census:** Black-throated Green Warbler, 9 (148, 60); Red-eyed Vireo, 2.5; Dark-eyed Junco, 1.5; Solitary Vireo, 1; Swainson's Thrush, 0.5; Am. Robin, 0.5; Barred Owl, +; Blue Jay, +; Com. Raven, +; Black-capped Chickadee, +; Winter Wren, +; Veery, +; Hermit Thrush, +; Rose-breasted Grosbeak, +; Brown-headed Cowbird, +. **Total:** 15 species; 15 territorial males (247/km², 100/100 acres). **Remarks:** Since the last previous survey (1978), a logging road has been cut through the last 110 yds of the plot. The road passes SE-NW and continues beyond the plot. It is also worth noting the increase in Black-throated Green Warblers from 1978 to 1983, an indication of maturing habitat.—M. BERDINE, A. HARRIS, M. HOOKER, V. JOHNSTON, J. JONES (compiler), G. PHILLIPS, J. PHILLIPS, S. REED, J. ROBBINS and D. SELLERS, Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.

28. MAPLE-OAK-BEECH FOREST.

— **Location:** West Virginia; Pocahontas Co.; Monongahela National Forest, on top of Burner Mountain, 5.5 mi NW from Durbin; starts at 38°35'59"N, 79°45'15"W, Durbin Quadrangle, USGS, extends NNE. **Continuity:** Established 1948; 5 intermittent years (between 1958 and 1978 listed under title "Cut-over Mature Hardwoods"). **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 27:960 (1973). The dominant canopy trees are Sugar Maple and N. Red Oak. Striped Maple and Sweet Birch dominate the understory. The ground cover is primarily Lady Fern, New York Fern and May-apple. A quantitative survey of the vegetation in 1978 gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples 208/acre; total basal area 189.2 ft²/acre. Species comprising 92% of the total number of trees: Sugar Maple 87, 42, 44, 100; Red Maple 28, 14, 12, 50; Red Oak, 20, 10, 30, 67; Am. Beech, 23, 11, 5, 83; Black Birch, 8, 4, 1, 33; dead trees, 25, 12, 4, 67. Trees by diameter size class: A (3-6 in.) 63, 30, 6.3, 3; B (6-9 in.) 38, 18, 11.5, 6; C (9-15 in.) 57, 27, 45.3, 24; D (15-21 in.) 35, 17, 63, 33; E (21-27 in.) 10, 5, 31, 16; F (27-33 in.) 2, 1, 8.2, 4; G (33-40 in.) 3, 2, 23.6, 13. Shrub stems/acre 1950; ground cover 41%; canopy cover 91%; average canopy height 61 ft (range 53-88). **Edge:** The forest continues on all sides. **Topography:** A generally level, broad "hogback" ridge at an elevation of 4020-4080 ft. **Weather:** Generally fair and cool with some early morning fog. **Coverage:** June 12-15; between

0530-0730 and 1900-2000 hrs, EDT. Total party-hours: 10+. **Census:** Red-eyed Vireo, 6 (99, 40); Ovenbird, 4 (66, 27); Black-throated Green Warbler, 3 (49, 20); Dark-eyed Junco, 2; Yellow-bellied Sapsucker, 1; Black-capped Chickadee, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Veery, 1; Mourning Warbler, 1; Rose-breasted Grosbeak, 1; Downy Woodpecker, +; Hairy Woodpecker, +; Wood Thrush, +. **Total:** 14 Species; 22 territorial males (362/km², 147/100 acres). **Visitors:** Yellow-billed Cuckoo, Blue Jay, Am. Crow, Great Crested Flycatcher. **Remarks:** The forested area may be considered a mature forest since selective timbering was done about 1955. There is an occasional open area due to fallen trees. The centerline of the plot was an old timber haul road, now seeded for game. The type of breeding birds is similar to those listed before the area was selectively timbered.—HAYWARD BALL, CAROLYN CONRAD, DOROTHY CONRAD, GEORGE HALL, GEORGE HURLEY, NORMA VENABLE, HESTER WERNER, JACK WERNER, KELLY WILDPRET, E. R. and ELIZABETH CHANDLER (compilers), Brooks Bird Club, 707 Warwood Ave., Wheeling WV 26003.

29. UPLAND BLACK CHERRY FOREST.

— **Location:** West Virginia; Pocahontas Co., Monongahela National Forest; 6.5 mi NE from Durban; starts at 38°36'41"N, 79°43'34"W, Thornwood Quadrangle, USGS, extends S. **Continuity:** Established 1968; 3 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 27:963 (1973). A mature hardwood forest dominated by Black Cherry. Most prominent in the understory are Striped Maple and Red Maple. The ground cover is primarily wood ferns and nettles. A quantitative vegetation survey in 1978 of six 0.1 acre circular samples gave Trees 3-in. and over dbh, 263/acre; total basal area 159 ft²/acre. Species comprising 93% of the total number of trees: Black Cherry, 70, 26, 63, 100; Sugar Maple, 33, 13, 13, 83; Red Maple, 37, 14, 11, 83; Am. Beech, 63, 24, 9, 100; Sweet Birch, 28, 11, 5, 83; dead trees, 12, 4, 1, 67. Trees by diameter size class: A (3-6 in.) 122, 46, 12, 8; B (6-9 in.) 63, 24, 19, 13; C (9-15 in.) 42, 16, 33, 22; D (15-21 in.) 25, 9, 45, 30; E (21-27 in.) 8, 3, 26, 17; F (27-33 in.) 33, 1, 16, 11. Shrub stems/acre 2642, ground cover 51%; canopy cover 88%; average canopy height 79 ft (range 61-89). **Edge:** Since 1973 the following changes have been made: A clear cut of about 50 acres, with second growth now about 6-8 ft in height, 200 yds off the NW corner; 100 yds to the NE a seeded road parallels the plot. To the SE, 150 yds directly off the end of the plot, there is a seeded clear cut that is part of the turkey management program. The forest continues in like habitat on the SW side, as it does beyond the above-mentioned disturbed areas. **Topography:** The plot starts 250 yds SE from Forest Route 14, at an elevation of 3800 ft and as it extends SE, rises to 3900 ft about mid-way, then down to 3875 ft at the end. The center line follows a seeded, seldom-used forest access road along the top of the ridge, a spur of Burner Mountain extending SE. The ridge is



BBC 30, 4-H Camp Aura, Hancock Co., W.V. Wild Cherry-Hickory Forest. Photo/A. R. Bucklew, Jr.

wide and almost level laterally. Near the end, where the entire plot is to the E of the crest, there is an elevation difference of about 25 ft across the 110 yd width. **Weather:** Generally clear and mild. Temp. range 42-74°. **Coverage:** June 6-10; between dawn and 0655 or 1905-2057 hrs, EDT. Total party-hours: 8.2. **Census:** Black-throated Green Warbler, 5 (82, 33); Red-eyed Vireo, 4 (66, 27); Veery, 3.5 (58, 23); Dark-eyed Junco, 2.5; Ovenbird, 2; Wood Thrush, 1; Solitary Vireo, 1; Rufous-sided Towhee, 1; Chestnut-sided Warbler, 0.5; Magnolia Warbler, 0.5; E. Wood-Pewee, +; Black-capped Chickadee, +; White-breasted Nuthatch, +; Am. Robin, +. **Total:** 14 species; 21 territorial males ($346/\text{km}^2$, 140/100 acres). **Visitors:** Tufted Titmouse, Black-throated Blue Warbler, Mourning Warbler and Rose-breasted Grosbeak. **Remarks:** This plot shows the continued influence of 2 open areas, a road and a clear cut. Special thanks for assistance to Virginia Johnson and Glen Phillips.—*M. BERDINE, C. ELLIS (compiler), M. EDGERTON, E. JACOBS, V. JOHNSON, J. JONES, M. KIFF, A. LLEWELLYN, A. PYLE, E. REICHELDERFER, M. THACKER, J. WARD and J. WOOD, Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.*

30. WILD CHERRY — HICKORY FOREST. — **Location:** West Virginia; Hancock Co., 4-H Camp Aura, 4.5 mi E of New Cumberland; $40^{\circ}30'25''\text{N}$, $80^{\circ}31'42''\text{W}$, East Liverpool South Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** Deciduous woods, undisturbed for many years. (former woodlot and abandoned orchard). The dominant canopy trees are Black

Cherry and Shagbark Hickory. Most prominent in the understory are hawthorn and blackberry. The ground cover is primarily touch-me-not and May-apple. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 300/acre; total basal area $53.2 \text{ ft}^2/\text{acre}$. Species comprising 91% of the total number of trees: Black Cherry, 77, 26, 36, 100; dead trees, 47, 16, 19, 67; hickory, 12, 4, 14, 67; a crabapple (*Pyrus coronaria*), 95, 32, 13, 50; hawthorn, 33, 11, 4, 83; Sugar Maple, 8, 3, 3, 33. Trees by diameter size class: A (3-6 in.) 185, 62, 19, 21; B (6.9 in.) 78, 26, 22, 24; C (9-15 in.) 22, 7, 17, 20; D (15-21 in.) 12, 4, 21, 23; E (21-27 in.) 3, 1, 10, 12. Shrub stems/acre 2441; ground cover 69%; canopy cover 74%; average canopy height 67 ft (range 56-99). **Edge:** Similar on all sides; composed of 2 plots to maintain homogeneity of the study area. **Topography:** Center line level on gentle slope (30 ft variation across plot). **Elevation:** 1100 ft. **Weather:** Cloudy cool and damp. **Coverage:** May 26-30; between dawn and 0800 hrs or 1800-2030 hrs. Total obs.-hours: 24. **Census:** Am. Redstart, 10 (165, 67); Rufous-sided Towhee, 9 (148, 60); Indigo Bunting, 7.5 (124, 50); Veery, 7 (115, 47); Red-eyed Vireo, 7; E. Wood-Pewee, 5 (82, 33); Wood Thrush, 5; Ovenbird, 3 (49, 20); Rose-breasted Grosbeak, 2.5; Black-throated Green Warbler, 2; Black-and-white Warbler, 2; Kentucky Warbler, 2; Hooded Warbler, 2; Scarlet Tanager, 2; Yellow-billed Cuckoo, 1+; Great Crested Flycatcher, 1+; Black-capped Chickadee, 1+; Red-bellied Woodpecker, 1; Tufted Titmouse, 1; Gray Catbird, 1; Louisiana Waterthrush, 1; Barred Owl, +; Cerulean Warbler, +. **Total:** 23 species; 73 territorial males or females ($1203/\text{km}^2$, 487/100 acres). **Visitors:** Pileated Woodpecker, Blue Jay, Com. Raven, Am. Robin, Am. Goldfinch, Brown-headed Cowbird. **Remarks:** The fertile soil of this area is derived from Virginia Greenstone and supports an unusually rich diversity of plant species. This, coupled with other features, may help to explain the very high productivity in species and individuals of birds. Thanks to Kathleen Finnegan, Diane Hollsinger, Betty Rosson, and Carrie Stanovick for help in plot lay-out and vegetative survey and to the personnel of the Shenandoah Na-

Jay, Am. Crow, Com. Grackle, Brown-headed Cowbird. **Remarks:** Nest found: Broad-winged Hawk.—*P. and J. GRAHAM, G. HURLEY, W. and N. MURRAY, J. B. OYS-TER, E. R. and ELIZABETH CHANDLER (compilers), Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.*

31. MESOPHYTIC FOREST. — Location:

Virginia; Green Co.; 7 mi E of Elkton, Va.; $38^{\circ}24'N$; $78^{\circ}29'W$, Madison Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** A mesophytic, mixed-age forest on the E side of the Blue Ridge Mountains in Shenandoah National Park. The dominant canopy trees are White Ash and N. Red Oak. Most prominent in the understory are Black Birch and White Ash. The ground cover is primarily Stinging Nettle and Black Cohosh. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 272/acre; total basal area $160 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: White Ash, 68, 25, 25, 100; N. Red Oak, 37, 14, 19, 100; Black Locust, 27, 10, 16, 67; Sweet Birch, 28, 10, 11, 100; dead trees (all species), 43, 16, 7, 50; White Oak, 3, 1, 6, 33; Red Maple, 27, 10, 6, 50. Trees by diameter size class: A (3-6 in.) 73, 27, 7.3, 4.5; B (6-9 in.) 85, 31, 25.3, 15.5; C (9-15 in.) 88, 32, 70.6, 44; D (15-21 in.) 18, 07, 33, 21; E (21-27 in.) 05, 02, 15.5, 10; F (27-33 in.) 02, 01, 8.1, 05. Shrub stems/acre 3,333; ground cover 47.5%; canopy cover 94%; average canopy height 56 ft (range 50-60 ft). **Edge:** A forest continuum without a defined edge. **Topography:** Rocky, mountain side with a 5-22° slope, a spring and stream. **Elevation:** 3040 ft. **Weather:** Typical of the season and location. **Coverage:** May 20, 27, 30-31; June 1-3, 7; between dawn and 0900 or 1800-2030 hrs. Total obs.-hours: 24. **Census:** Am. Redstart, 10 (165, 67); Rufous-sided Towhee, 9 (148, 60); Indigo Bunting, 7.5 (124, 50); Veery, 7 (115, 47); Red-eyed Vireo, 7; E. Wood-Pewee, 5 (82, 33); Wood Thrush, 5; Ovenbird, 3 (49, 20); Rose-breasted Grosbeak, 2.5; Black-throated Green Warbler, 2; Black-and-white Warbler, 2; Kentucky Warbler, 2; Hooded Warbler, 2; Scarlet Tanager, 2; Yellow-billed Cuckoo, 1+; Great Crested Flycatcher, 1+; Black-capped Chickadee, 1+; Red-bellied Woodpecker, 1; Tufted Titmouse, 1; Gray Catbird, 1; Louisiana Waterthrush, 1; Barred Owl, +; Cerulean Warbler, +. **Total:** 23 species; 73 territorial males or females ($1203/\text{km}^2$, 487/100 acres). **Visitors:** Pileated Woodpecker, Blue Jay, Com. Raven, Am. Robin, Am. Goldfinch, Brown-headed Cowbird. **Remarks:** The fertile soil of this area is derived from Virginia Greenstone and supports an unusually rich diversity of plant species. This, coupled with other features, may help to explain the very high productivity in species and individuals of birds. Thanks to Kathleen Finnegan, Diane Hollsinger, Betty Rosson, and Carrie Stanovick for help in plot lay-out and vegetative survey and to the personnel of the Shenandoah Na-

tional Park for their cooperation in the study —*ELWOOD FISHER and CHARLES ZIEGENFUS*. *James Madison Univ., Harrisonburg, VA 22807.*

32. MIXED OAK FOREST. — **Location:** Virginia, Rockingham Co.; 3.25 mi SE of Mauzy, E of State Road 620; 38°32'5"N, 78°41'50"W, Tenth Legion Quadrangle, USGS. **Continuity:** Established 1978; 2 intermittent years. **Size:** 8.1 ha = 20 acres. The plot was lengthened this year to 880 yds increasing the area from 6.1 ha (15 acres) to 8.1 ha (20 acres). **Description of Plot:** See AB 33 60-61 (1979). Since 1978 some salvage and selective cutting has left small open spots in the canopy, several small logging trails, and a decreased density of underbrush in some areas. **Weather:** The early spring was cooler and wetter than normal; mornings were seasonably warm, sunny, and very humid. Afternoon thunderstorms were frequent. **Coverage:** May 28, 31; June 1-3, 5, 14-15, 17, 21; July 5; 0520-0900 and 2000-2200. Total obs.-hours: 18+. **Census:** Tufted Titmouse, 6 (74, 30); E. Wood-Pewee, 3.5 (43, 18); Rufous-sided Towhee, 3.5; Red-eyed Vireo, 3 (37, 15); Scarlet Tanager, 3; Blue Jay, 2; Downy Woodpecker, 1.5; White-breasted Nuthatch, 1.5; Great Crested Flycatcher, 1; Blue-gray Gnatcatcher, 1; Wood Thrush, 1; Ruffed Grouse, +; Barred Owl, +; Whip-poor-will, +; Red-bellied Woodpecker, +; Pileated Woodpecker, +; Am. Crow, +; Fish Crow, +; Carolina Wren, +; Am. Robin, +; N. Cardinal, +; Brown-headed Cowbird, + (0.5 ♂/trip). **Total:** 22 species; 27 territorial males (334/km², 135/100 acres). **Visitors:** Yellow-billed Cuckoo, N. Flicker, Carolina Chickadee, Worm-eating Warbler, Chestnut-sided Warbler, Pine Warbler, Com. Grackle, Am Goldfinch. **Remarks:** Increasing the total area of the plot by 32% did not alter the species list significantly, but the number of territorial males/km² increased more than 50% over the 1978 count. A mild winter, a moist early spring, and a warm drier June may explain more of this increase than the increased acreage. Tufted Titmouse showed a significant change in density, from a plus (+) bird, less than 8 pairs/km², in 1978, to 74 pairs/km² this year. Special thanks to Hollen Helbert for permission to take the census on his land.—A. CLAIR MELLINGER, Biol. Dept., Eastern Mennonite College, Harrisonburg, VA 22801.

33. OAK-HICKORY FOREST. — **Location:** Virginia, Rockingham Co.; NE Penn Laird, 38°23'02"N, 78°47'40"W, Harrisonburg Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** A select cut took place in this oak-hickory association approximately 30-40 years ago. An overall slope ranged from 7-32°. A small creek runs through the entire plot. The dominant canopy trees are Chestnut Oak and N. Red Oak. Most prominent in the understory are huckleberry and Mountain-Laurel. The ground cover is primarily Virginia Creeper and Spotted Winter-

green. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 339/acre; total basal area 110 ft²/acre. Species comprising 95% of the total number of trees: Chestnut Oak 87, 26, 31, 100; N. Red Oak 47, 14, 27, 100; E. White Pine, 32, 9, 10, 50; White Oak, 43, 13, 7, 83; Bitternut Hickory, 43, 13, 7, 67; Blackjack Oak, 15, 4, 5, 67; Am. Sycamore, 5, 1, 3, 17; Blackgum, 8, 2, 3, 17. Trees by diameter size class: A (3-6 in.) 18, 54, 18, 16; B (6-9 in.) 77, 23, 23, 21; C (9-15 in.) 72, 21, 57, 52; D (15-21 in.) 7, 2, 12, 11. Shrub stems/acre 6517; ground cover 36%; canopy cover 88%; average canopy height 45 ft (range 33-69). **Edge:** Surrounded by similar vegetation on all sides. **Topography:** A S-SW slope at the base of the peak of Massanutten mountain. **Elevation:** 1300 ft. **Weather:** Mostly clear, temp. 45-70°. **Coverage:** May 13, 26, 28; June 1, 9, 23, 26; between dawn and 1000 or 1930-2100 hrs. Total party-hours: 10. **Census:** E. Wood-Pewee, 2; Great Crested Flycatcher, 2; Tufted Titmouse, 2; Louisiana Waterthrush, 2; Scarlet Tanager, 2; Wood Thrush, 1.5; Am. Robin, 1; Red-eyed Vireo, 1; Worm-eating Warbler, 1; Ovenbird, 1; Rufous-sided Towhee, 1; Broad-winged Hawk, +; Whip-poor-will, +; Red-bellied Woodpecker, +; Carolina Wren, +; Indigo Bunting, +. **Total:** 16 species; 16.5 territorial males or females (272/km², 110/100 acres). **Visitors:** Turkey Vulture, Ruffed Grouse, Blue Jay, White-breasted Nuthatch, Com. Grackle, Brown-headed Cowbird. **Remarks:** The Broad-winged Hawk has been seen on this land for many years. In general, birds were more active after 0700 hrs than at dawn. Special thanks to Dr. and Mrs. Eggleston for the use of their land for the survey. Also, to Elwood Fisher, Kathleen Finnegan, Diane Holsinger and Betty Rosson for their contributions to both bird census and vegetative survey.—CARRIE STANOVICK and CHARLES ZIEGENFUS. *James Madison Univ., Harrisonburg, VA 22807.*

34. UPLAND OAK-HICKORY FOREST. — **Location:** Virginia; Fairfax Co., Dranesville District Park, McLean, along Route 193 (Old Georgetown Pike), approximately ¾ mi W of Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973; 11 consecutive years. **Size:** 11 ha = 27.2 acres. **Description of Plot:** See AB 25:636 (1971) and 34:49 (1980). **Weather:** Cooler than average during the first half of the period. Temp. on trips 26-86°F; average 53°; rain on 1 trip. **Coverage:** Mar. 26, 30; Apr. 3, 11, 14, 17, 19, 23, 27; May 1, 7, 9-12, 15, 24-25; June 4, 6, 13; July 7, 14; 0530-1100 or 1400-1930. Total obs.-hours: 42.8. **Census:** Red-eyed Vireo, 16 (145, 59); Wood Thrush, 12.5 (114, 46); Tufted Titmouse, 11 (100, 40); Carolina Chickadee, 9.5 (86, 35); White-breasted Nuthatch, 8 (73, 29); Scarlet Tanager, 7 (64, 26); N. Cardinal, 6.5 (59, 24); Ovenbird, 6 (55, 22); Red-bellied Woodpecker, 5.5 (50, 20); Downy Woodpecker, 5 (45, 18); Brown-headed Cowbird, 5; Blue Jay, 4 (36, 15); Hairy Woodpecker, 3 (27, 11); E.

Wood-Pewee, 2.5; Acadian Flycatcher, 2.5; Great Crested Flycatcher, 2; Brown Creeper, 2; N. Flicker, 1.5; Pileated Woodpecker, 1.5; Blue-gray Gnatcatcher, 1; Worm-eating Warbler, 1; Louisiana Waterthrush, 1; Broad-winged Hawk, +. **Total:** 23 species; 114 territorial males (1037/km², 419/100 acres). **Visitors:** Mourning Dove, E. Phoebe, Am Crow, Carolina Wren, Am. Redstart, Kentucky Warbler, Com. Grackle. **Remarks:** Nests found: Red-bellied Woodpecker 2, Carolina Wren 2.—DOREEN BUSCEMI, GILBERT ESPENSHADE, JESSICA GIUSTI, C.W. PER-LEE, JR. (co-compiler), ROBERT J. WATSON (co-compiler), 2636 Marcy Rd., Arlington, VA 22207.

35. 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°53'N, 79°0'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1977; 7 consecutive years. **Size:** 13.0 ha = 32.1 acres. **Description of Plot:** See AB 32:63 (1978). **Coverage:** Apr. 28-June 28; 10 visits. Total party-hours: 20. **Census:** Red-eyed Vireo, 20 (154, 62); Acadian Flycatcher, 12 (92, 37); Blue-gray Gnatcatcher, 8 (62, 25); Wood Thrush, 8; Kentucky Warbler, 7 (54, 22); Tufted Titmouse, 6 (46, 19); Carolina Chickadee, 5 (38, 16); Hooded Warbler, 5; N. Cardinal, 4 (31, 12); Ruby-throated Hummingbird, 3 (23, 9); Red-bellied Woodpecker, 3; Downy Woodpecker, 2.5; Scarlet Tanager, 2.5; Yellow-throated Vireo, 2; Yellow-billed Cuckoo, 1; N. Parula, 1; Red-headed Woodpecker, 0.5; Red-shouldered Hawk, +; Barred Owl, +; Hairy Woodpecker, +; Pileated Woodpecker, +; Blue Jay, +; Am. Crow, +; White-breasted Nuthatch, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 26 species; 90.5 territorial males (697/km², 282/100 acres). **Visitors:** Green-backed Heron, N. Bobwhite, N. Flicker, E. Bluebird, Pine Warbler, Black-and-white Warbler, Ovenbird, Louisiana Waterthrush, Summer Tanager, Indigo Bunting. **Remarks:** A Tufted Titmouse's nest was found, and fledgling Carolina Wrens, Red-eyed Vireos, and Kentucky Warblers were seen.—S. HALL (co-compiler), K. MEYER, H. MUELLER (co-compiler), D. STUCKEY, J. TRAINER, J. WHITEHEAD, H. WILEY Dept. of Biology, Univ. of North Carolina, Chapel Hill, NC 27514.

36. 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°21'N, 79°01'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1976, 8 consecutive years. **Size:** 12.55 ha = 31 acres. **Description of Plot:** See AB 31:41 (1977). **Coverage:** May 1-24 June; 10 visits Total party-hours: 21. **Census:** Red-eyed Vireo, 15 (120, 48); Wood Thrush, 8 (64, 26); Tufted Titmouse, 5.5 (44, 18); Acadian Flycatcher, 5 (40, 16); Blue-gray Gnatcatcher, 4 (32, 13); Summer Tanager, 4; Carolina Chickadee, 3.5 (28, 11); Scarlet Tanager, 3.5; N.

Cardinal, 3 5, Ovenbird, 3 (24, 10), Yellow-billed Cuckoo, 2.5; Carolina Wren, 2.5; Hooded Warbler, 2.5; Ruby-throated Hummingbird, 2; Red-bellied Woodpecker, 2; Yellow-throated Vireo, 2; Kentucky Warbler, 2; Downy Woodpecker, 1.5; E. Wood-Pewee, 1.5; Mourning Dove, 1; Hairy Woodpecker, 1; White-breasted Nuthatch, 1; Pine Warbler, 0.5; E. Screech-Owl, +; Barred Owl, +; Whippoorwill, +; N. Flicker, +; Pileated Woodpecker, +; Blue Jay, +; Am. Crow, +; Brown-headed Cowbird, +. **Total:** 31 species; 77 territorial males ($614/\text{km}^2$, 248/100 acres). **Visitors:** Great Crested Flycatcher, E. Bluebird, White-eyed Vireo, Com. Grackle, Am. Goldfinch. **Remarks:** Newly fledged E. Screech-Owls, Carolina Chickadees, Tufted Titmice, and cowbirds were seen (2 young cowbirds with a Hooded Warbler).—*S. HALL* (co-compiler), *K. MEYER*, *H. MUELLER* (co-compiler), *N. MUELLER*, *J. TRAINER*, *J. WHITEHEAD*, *H. WILEY*, Dept. of Biology, Univ. of North Carolina, Chapel Hill, NC 27514.

37. HARDWOOD SWAMP FOREST. —**Location:** South Carolina; Dorchester Co., 6.5 mi E of Harleyville, in National Audubon Society's Francis Beidler Forest in Four Holes Swamp; $33^{\circ}11'N$, $80^{\circ}19'W$, Pringleton Quadrangle, USGS. **Continuity:** Established 1979; 3 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 34:50 (1980). **Weather:** Mostly cloudy and calm, with a few light drizzles. Temp. 44-66°F. **Coverage:** Apr. 26; May 4, 9, 13, 20, 24, 27; June 2; dawn-0845. Total party-hours: 16.3. **Census:** Blue-gray Gnatcatcher, 20 (247, 100); N. Parula, 16 (198, 80); White-eyed Vireo, 15.5 (192, 78); Red-eyed Vireo, 12 (148, 60); Hooded Warbler, 12; Carolina Wren, 11.5 (142, 58); Prothonotary Warbler, 10 (124, 50); Tufted Titmouse, 8.5 (105, 43); Red-bellied Woodpecker, 7.5 (93, 38); Acadian Flycatcher, 7.5; Yellow-billed Cuckoo, 7 (86, 35); N. Cardinal, 5 (62, 25); Downy Woodpecker, 3 (37, 15); Carolina Chickadee, 2.5; Pileated Woodpecker, 2; Great Crested Flycatcher, 2; Wood Thrush, 2; Am. Crow, 1; Fish Crow, 1; Yellow-throated Warbler, 1; Summer Tanager, 1; Swainson's Warbler, 0.5. **Total:** 22 species; 148.5 territorial males ($1835/\text{km}^2$, 743/100 acres). **Visitors:** Great Blue Heron, Little Blue Heron, Great Egret, Green-backed Heron, Yellow-crowned Night Heron, White Ibis, Wood Duck, Mourning Dove, Barred Owl, Chimney Swift, Blue Jay, Gray Catbird, Com. Yellowthroat, Com. Grackle, Brown-headed Cowbird. **Remarks:** Compared to 1981, the total nesting density has increased by 24%, although the species composition has remained essentially unchanged. Several environmental factors may have contributed to this dramatic increase, which has been shared across the board by most of the nesting species. This area has experienced huge outbreaks of Forest Tent Caterpillars, particularly during the preceding 2 nesting seasons. The caterpillars were a readily available food source which may have contributed to greater nesting success for those species which will feed on them, most notably

the Yellow-billed Cuckoo. The repeated early spring defoliations of the canopy caused by the caterpillars has resulted in greater herbaceous growth in the understory, perhaps favoring such understory nesters and feeders as the Hooded Warbler. However, most of the species generally associated with shrubby thickets and undergrowth, including the Wood Thrush, White-eyed Vireo, and N. Cardinal, were among those species with nesting densities that remained lower than they were in 1979. This may be the natural result of the steady succession of this logged area to a mature forest with little shrubby undergrowth. At the same time, the species showing the most notable increases in nesting density are ones generally associated with tall trees and mature forests, including the Blue-gray Gnatcatcher, Red-eyed Vireo and all the resident woodpeckers. The most inexplicable decline was that of the Carolina Chickadee (61%). Even more disturbing has been the steady decline of the Swainson's Warbler over the last 4 years (90%), a reflection perhaps of either forest succession or a general decline of this species throughout its range.—*KENNETH STROM* (compiler), *NORMAN L. BRUNSWIG*, *CHERYL PHILLIPS*, Route 1, Box 114, Harleyville, SC 29448.

38. HARDWOOD WOODLOT. —**Location:** Ontario; Kent Co., Chatham, approximately 1.7 mi (2.7 km) SE of Chatham; $42^{\circ}23'0''N$, $82^{\circ}7'45''W$. **Continuity:** New. **Size:** 10.2 ha = 25.2 acres. **Description of Plot:** The dominant canopy tree is White Ash. Most prominent in the understory are Am. Hornbeam, Am. Elm, Am. Hophornbeam, Spicebush, Black Cherry and Black Locust. The ground cover is composed predominantly of Poison Ivy and Virginia Creeper. A quantitative survey of the vegetation revealed the following results: Trees, 3-in. (8 cm) diameter and over, based on 0.1 acre (0.04 ha) circular samples, 246/acre (615/ha); total basal area $95.8 \text{ ft}^2/\text{acre}$ (21.6 m^2/ha). Species comprising 90% of the total number of trees [figures after each give number of trees/acre (trees/ha), relative density (%), relative dominance and frequency, in that sequence]: White Ash 101 (253), 41, 41, 100; Am. Hornbeam 30 (75), 12, 3, 50; Beech 11 (28), 4, 9, 50; Am. Elm 10 (25), 4, 2, 17; Am. Hophornbeam 10 (25), 4, 1, 17; Black Cherry 10 (25), 4, 5, 67; Swamp White Oak 8 (20), 3, 17, 17; Balsam Poplar 6 (15) 2, 3, 17; Shagbark Hickory 6 (15), 2, 2, 50; Sugar Maple 6 (15), 2, 5, 33; and dead trees 29 (73), 12, 6, 83. Trees by diameter size class [figures after each give number of trees/acre (trees/ha), relative density (%), basal area in ft^2/acre (m^2/ha) and relative dominance]: A [3-6 in. (8-15 cm)] 136 (340), 55, 13.6 (3.1), 14; B [6-9 in. (15-23 cm)] 56 (140), 23, 16.8 (3.8), 18; C [9-15 in. (23-38 cm)] 43 (108), 18, 34.6 (7.8), 36; D [15-21 in. (38-53 cm)] 8 (20), 3, 14.4 (3.2), 15; E [21-27 in. (53-68 cm)] 2 (5), 1, 5.0 (1.1), 5; G [33-40 in. (83-100 cm)] 2 (5), 1, 11.4 (2.6), 12. Shrub stems/acre (shrub stems/ha) 31,467 (78,668); ground cover 63%; canopy cover 91%; average canopy height 88.3 ft (26.75 m) [range 61.1-110.6 (18.5-33.5 m)].

Edge: Bordered on 3 sides by agricultural fields and on 1 by a railroad. **Topography:** Essentially flat. **Elevation:** 598 ft (182 m). **Weather:** Warm and dry. **Coverage:** May 27-June 24; between dawn and 0800 or 2100-2200, EST. Total obs.-hours: 14. **Census:** Red-eyed Vireo, 4 (39, 16); E. Wood-Pewee, 3 (29, 12); Wood Thrush 3; Am. Robin 2, N. Cardinal, 1.5; Great Crested Flycatcher, 1, Gray Catbird, 1. **Total:** 7 species; 15.5 territorial males ($152/\text{km}^2$, 62/100 acres). **Visitors:** Yellow-billed Cuckoo, Great Horned Owl, Ruby-throated Hummingbird, Downy Woodpecker, Hairy Woodpecker, N. Flicker, Yellow-bellied Flycatcher, Acadian Flycatcher, Least Flycatcher, Blue Jay, House Wren, Veery, Swainson's Thrush, Cedar Waxwing, Warbling Vireo, Blue-winged Warbler, Magnolia Warbler, Blackburnian Warbler, Bay-breasted Warbler, Ovenbird, Canada Warbler, Rose-breasted Grosbeak, Indigo Bunting, Savannah Sparrow, Red-winged Blackbird, Com. Grackle, N. Oriole.—*DEBRA A. CHAMBERLAIN*, *MARK WIERCINSKI* and *JOHN NEWDICK*, Canadian Wildlife Service, Environment Canada, 152 Newbold Cr., London, Ont., Canada

URBAN WOODLOTS IN ONTARIO

The following 18 Breeding Bird Censuses, numbers 39-56, all conducted in Ontario and all but the last on very small plots, actually represent 49 studies, since more than one year's survey was taken for all but one plot. The years span 1978-1981, with 5 censuses conducted in all 4 years, 4 censuses in 3 years, 8 conducted in 2 years, and 1 for one year. Seven were held in 1978, 17 in 1979, 18 in 1980, and 7 in 1981. In each, the field assistance of Paul Smith, Dave Fewster and Frank Remiz are acknowledged, as is the support of R.I.C. Hansell. *The author is ARNIE GOTFRYD*, Dept. of Zoology, Univ. of Toronto, Toronto, Ont. M5S 1A1.

39. URBAN MAPLE-OAK WOODLOT. —**Location:** Ontario, Peel Co., Mississauga, 0.6 km SW of Creditview Rd., just N of Burnhamthorpe Rd.; $43^{\circ}34'N$, $79^{\circ}40'W$. **Continuity:** New (1978); 4 consecutive years. **Size:** 4 ha = 10 acres (irregular, 380×100 yds on average [this would make it less than 8 acres—Ed.]). **Description of Plot:** This plot is particularly interesting because its vegetation and wildlife was assessed continuously over a period of rapid urbanization commencing in 1978 when the plot was still surrounded by 90 acres of similar forest (AB 33:63 (1979)). Although only a mile from the Mississauga City Centre, the plot and environs were wild enough to support a resident population of White-tailed Deer (*Odocoileus virginianus borealis*). By 1981, the surrounding forest was cleared and replaced by homes and roads while the 10-acre plot itself remained unaltered except for the installation of a subtle pedestrian path system. The canopy is dominated by Sugar Maple, White Ash, N. Red Oak and Swamp White Oak. Other canopy trees include Shagbark Hickory, Bitternut

Hickory, White Oak and Am Basswood The understory and shrubbery are dominated by Am Hophornbeam, dogwoods, Chokecherry and White Ash. The ground cover is particularly rich with over 50 herbaceous species identified. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 300/acre. Total basal area: 130 ft²/acre. Species comprising 90% of the total number of trees: Sugar Maple, 81, 27, 19, 88; White Ash, 53, 18, 14, 100; dead trees, 36, 12, 13, 88; Shagbark Hickory, 24, 8, 7, 88; Am. Hophornbeam, 18, 6, 2, 38; N. Red Oak, 14, 5, 14, 38; Bitternut Hickory, 13, 4, 3, 38; Swamp White Oak, 13, 4, 14, 63; Am Basswood, 9, 3, 3, 38; White Oak, 9, 3, 6, 25. Trees by diameter size class: A (3-6 in.) 129, 43, 13, 10; B (6-9 in.) 85, 28, 26, 20; C (9-15 in.) 65, 22, 52, 40; D (15-21 in.) 20, 7, 36, 28; E (21-27 in.) 1, 0, 4, 3. Shrub stems/acre 3250; ground cover 44%; canopy cover 75%, average canopy height 53 ft (range 24-72 ft). **Edge:** 1978: Forest continues on all sides, 1979: 40 ft swaths cut for roadways around perimeter of plot; 1980: Houses cleared and some homes erected; 1981: New homes and surfaced roads surround plot. **Topography:** Essentially flat. **Elevation:** 510 ft. **Weather:** 1978: Mainly clear and warm, moderate breezes during 2 trips. 1979: Cloudy, breezy on 3 trips, otherwise fair and mild 1980: 3 windy trips, otherwise fair and mild 1981: Partly cloudy and mild. **Coverage:** 1978: May 18-July 6; 0600-0930 hrs; 10.8 obs.-hours; 1979: May 28-July 7; 0600-0930 hrs; 10.2 obs.-hours; 1980: May 4-July 6, 0600-0930 hrs; 10.3 obs.-hours; 1981: May 24-June 23; 0600-0930 hrs; 9.4 obs.-hours. **Census:** 1978: Blue Jay, 2; Com. Grackle, 2; Am. Robin, 1.5; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; Black-capped Chickadee, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Brown-headed Cowbird (♀), 1; Indigo Bunting, 1; N. Flicker, 0.5. 1979: Com. Grackle, 3 (74, 30); Blue Jay, 2; Black-capped Chickadee, 2; Am. Crow, 1.5; Wood Thrush, 1.5; Red-headed Woodpecker, 1; N. Flicker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Rose-breasted Grosbeak, 1; White-breasted Nuthatch, 0.5; House Wren, 0.5; Indigo Bunting, 0.5. 1980: Blue Jay, 2.5; Song Sparrow, 2.5; Black-capped Chickadee, 2; Am. Robin, 2; Great Crested Flycatcher, 1.5; House Wren, 1.5; Cedar Waxwing, 1.5; Eur. Starling, 1.5; N. Cardinal, 1.5; Com. Grackle, 1.5; N. Oriole, 1.5; N. Flicker, 1; Downy Woodpecker, 1; E. Wood-Pewee, 1; Am. Crow, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Rose-breasted Grosbeak, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 1; Gray Catbird, 0.5. 1981: Eur. Starling, 2; Song Sparrow, 2; N. Oriole, 2; Brown-headed Cowbird (♀), 2; Downy Woodpecker, 1; N. Flicker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; House Wren, 1; Wood Thrush, 1; Am. Robin, 1; Gray Catbird, 1; Cedar Waxwing, 1; N. Cardinal, 1; Indigo Bunting, 1; Red-winged Blackbird, 1; Com. Grackle, 1; White-breasted Nuthatch, 0.5; Rose-breasted Grosbeak, 0.5; Am. Goldfinch, 0.5; Great Horned Owl, +. **Total:** 1978: 12 species; 14

territorial males (346/km², 140/100 acres) 1979: 13 species, 16.5 territorial males (408/km², 165/100 acres). 1980: 22 species; 30 territorial males (741/km², 300/100 acres). 1981: 23 species; 24.5 territorial males (605/km², 245/100 acres). **Remarks:** The urbanized surroundings were completely devoid of breeding avifauna in 1980 and by 1981 only one starling had colonized the subdivision. On the other hand, the numbers of bird species and individuals found virtually doubled during urbanization.

40. URBAN BASSWOOD-MAPLE WOODLOT.

Location: Ontario, Peel Co., Mississauga; Glen Erin Dr., 0.5 km S of Derry Rd.; 43°35'N, 79°46'W. **Continuity:** New (1978); 4 consecutive years. **Size:** 2.2 ha = 5.5 acres (roughly rectangular, 160 × 120 yds on average [this would make about 4 acres—Ed.]). **Description of Plot:** This young woodlot is dominated by Am. Basswood, many of which are faring poorly. The other prominent canopy species are Sugar Maple and Bitternut Hickory. The understory-shrub layer is comprised mainly of the canopy species, Am. Hophornbeam, hawthorn, White Ash and Chokecherry. A well-designed asphalt path system is proving successful in minimizing human impact on the forest floor. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 468/acre. Total basal area: 143 ft²/acre. Species comprising 92% of the total number of trees: Am. Basswood, 151, 32, 53, 100; Sugar Maple, 146, 31, 17, 100; Am. Hophornbeam, 75, 16, 8, 100; Bitternut Hickory, 41, 9, 12, 88; Hawthorn, 19, 4, 1, 38. Trees by diameter size class: A (3-6 in.) 241, 51, 24, 17; B (6-9 in.) 136, 29, 41, 29; C (9-15 in.) 86, 18, 69, 48; D (15-21 in.) 5, 1, 9, 6. Shrub stems/acre 2169; ground cover 36%; canopy cover 66%; average canopy height 47 ft (range 28-57 ft). **Edge:** New row housing, plaza and road surround 85% of plot. Extensive lawn borders part of the N edge of the woodlot. **Topography:** Flat. **Elevation:** 650 ft. **Weather:** 1978: Partly cloudy, warm, calm. 1979: Variable cloudiness, mild, 2 windy days. 1980: Usually cloudy, cool and calm, 2 rainy days. 1981: Variable cloudiness, mild, calm. **Coverage:** 1978: June 3-July 8; 0600-0900 hrs. 4.2 obs.-hours. 1979: Apr. 28-July 3; 0600-0930 hrs; 5.7 obs.-hours. 1980: May 3-July 3; 0600-0930 hrs; 8.4 obs.-hours. 1981: May 25-June 30; 0600-0930 hrs; 3.5 obs.-hours. **Census:** 1978: Eur. Starling, 3 (135, 55); Com. Grackle, 2; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; Am. Robin, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; House Sparrow, +. 1979: Eur. Starling, 4 (180, 73); Am. Robin, 1.5; Com. Grackle, 1.5; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; Cedar Waxwing, 1; Brown-headed Cowbird (♀), 1; Downy Woodpecker, +; House Sparrow, +. 1980: Eur. Starling, 5 (225, 91); Com. Grackle, 2; Downy Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; Am. Robin, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; House Sparrow, +. 1981: Eur. Starling, 10 (797, 323); Am. Robin, 1; N. Cardinal, 1; N. Oriole, 1; Red-winged Blackbird, 0.5; Am. Goldfinch, +. **Total:** 1978: 6 species; 10 territorial males (797/km², 323/100 acres) 1979: 4 species; 10 territorial males (797/km², 323/100 acres). 1980: 6 species; 11.5 territori-

+ 1981: Eur. Starling, 5 (225, 91); Cedar Waxwing, 2; Am. Robin, 1.5; Downy Woodpecker, 1; N. Flicker, 1; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 1; Red-winged Blackbird, +; House Sparrow, +. **Total:** 1978: 9 species; 11 territorial males (494/km², 200/100 acres). 1979: 10 species; 12 territorial males (539/km², 218/100 acres). 1980: 13 species, 17 territorial males (764/km², 309/100 acres). 1981: 13 species; 16.5 territorial males (741/km², 300/100 acres).

41. URBAN BEECH-ASH-MAPLE WOODLOT.

Location: Ontario, Peel Co., Mississauga; Glen Erin Dr., 0.5 km N of Britannia Rd.; 43°35'N, 79°45'W. **Continuity:** New (1978); 4 consecutive years. **Size:** 1.3 ha = 3.1 acres (triangular, 200 × 145 × 145 yds). **Description of Plot:** The canopy and subcanopy are quite similar in composition, both being dominated by Am. Beech, White Ash and Sugar Maple, with lesser amounts of Am. Basswood. In the shrub layer, Sugar Maple and Chokecherry are most dense and ubiquitous; hawthorns and others appear in clumps near the edges. Despite the woodlot's small size, it is quite rich in topography and structurally diverse in vegetation. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over; 184/acre. Total basal area: 118 ft²/acre. Species comprising 93% of the total number of trees: Am. Beech, 54, 29, 36, 86; White Ash, 47, 26, 31, 100; Sugar Maple, 37, 20, 20, 86; Hawthorn, 17, 9, 2, 14; Am. Basswood, 11, 9, 7, 71. Trees by diameter size class: A (3-6 in.) 66, 36, 7, 6; B (6-9 in.) 41, 22, 12, 11; C (9-15 in.) 60, 33, 67, 56; D (15-21 in.) 16, 9, 28, 24; E (21-27 in.) 1, 1, 4, 4. Shrub stems/acre 8450; ground cover 39%; canopy cover 66%; average canopy height 56 ft (range 34-65 ft). **Edge:** Bordered in equal proportions by new homes, 4-lane road, and extensive lawn. **Topography:** High ground around perimeter, dropping suddenly towards the interior. However, no standing or running water collects. **Elevation:** 620 ft. **Weather:** 1978: Clear, warm, calm. 1979: Mainly clear, warm, 2 windy days. 1980: Mainly clear, cool, calm, 2 rainy days. 1981: Partly cloudy, warm, calm. **Coverage:** 1978: May 29-July 7, 0600-0930 hrs; 2.4 obs.-hours. 1979: May 4-July 3; 0600-0930 hrs; 4.2 obs.-hours. 1980: May 4-July 3; 0600-0930 hrs; 4.8 obs.-hours. 1981: May 25 and June 2, 0600-0930 hrs; 1.8 obs.-hours. **Census:** 1978: Eur. Starling, 6 (478, 194); Blue Jay, 1; Am. Robin, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; House Sparrow, +. 1979: Eur. Starling, 9 (717, 290); Com. Grackle, 1; Com. Crow, +; House Sparrow, +. 1980: Eur. Starling, 9 (717, 290); Am. Crow, 1; N. Oriole, 1; Am. Goldfinch, 0.5; Black-capped Chickadee, +; House Sparrow, +. 1981: Eur. Starling, 10 (797, 323); Am. Robin, 1; N. Cardinal, 1; N. Oriole, 1; Red-winged Blackbird, 0.5; Am. Goldfinch, +. **Total:** 1978: 6 species; 10 territorial males (797/km², 323/100 acres) 1979: 4 species; 10 territorial males (797/km², 323/100 acres). 1980: 6 species; 11.5 territori-

al males ($917/\text{km}^2$, 371/100 acres) **1981:** 6 species; 13.5 territorial males ($1076/\text{km}^2$, 435/100 acres).

42. URBAN OAK-MAPLE WOODLOT. — **Location:** Ontario, Peel Co., Mississauga; Windjammer Rd., just N of Council Ring Rd.; $43^\circ 32' \text{N}$, $79^\circ 41' \text{W}$. **Continuity:** New (1978); 4 consecutive years. **Size:** 0.9 ha = 2.2 acres (nearly rectangular, 120 × 90 yds on average). **Description of Plot:** The canopy is dominated by N. Red Oak, Swamp White Oak, and Red Maple. The subcanopy is mainly Red Maple, White Ash, Am. Beech and Am. Hophornbeam, with lesser amounts of Am. Basswood, Sugar Maple and hawthorn. The shrub layer is reasonably diverse but quite patchy due to the continuous flux of children from the neighboring schoolyard and homes. The principal shrub-sized species are Black Cherry, White Ash, and Am. Hornbeam. In 1978, a tiny pond was drained and covered with sand by the City, presumably for mosquito control. As a result of this and other drainage stresses, the mesic trees are dying out fairly rapidly. Much of the forest floor is completely denuded of cover and compacted. A quantitative survey of the vegetation gave the following results: Trees 3-in diameter and over: 278/acre; total basal area: 148 ft^2/acre . Species comprising 90% of the total number of trees: N. Red Oak, 45, 16, 32, 83; Red Maple, 42, 15, 11, 67; White Ash, 35, 13, 8, 83; Am. Beach, 28, 10, 7, 67; dead trees, 23, 8, 7, 67; Am. Hophornbeam, 23, 8, 2, 67; Swamp White Oak, 20, 7, 17, 50; Am. Basswood, 17, 6, 5, 50; Sugar Maple, 15, 5, 4, 50; hawthorn, 7, 2, 1, 17. Trees by diameter size class: A (3-6 in.) 110, 40, 11, 7; B (6-9 in.) 75, 27, 23, 15; C (9-15 in.) 70, 25, 56, 38; D (15-21 in.) 20, 7, 36, 24; E (21-27 in.) 3, 1, 10, 7; G (33-40 in.) 2, 1, 12, 8. Shrub stems/acre 4292; ground cover 47%; canopy cover 68%; average canopy height 51 ft (range 32-68 ft). **Edge:** Surrounded by new homes on 3 sides, and lawn on the 4th. **Topography:** Flat. **Elevation:** 550 ft. **Weather:** 1978-1981: Partly cloudy, warm and calm, but somewhat windier in 1979. **Coverage:** 1978: May 29-July 5, 0600-0930 hrs. 2.8 obs.-hours. 1979: May 10-July 3; 0600-0930 hrs; 4.6 obs.-hours. 1980: May 3-July 3; 0600-0930 hrs. 5.7 obs.-hours. 1981: May 25 and June 2, 0600-0930 hrs. 2 obs.-hours. **Census:** 1978: Com. Grackle, 1.5; E. Wood-Pewee, 1; Tree Swallow, 1; Am. Robin, 1; Eur. Starling, 1; Red-winged Blackbird, 1; Blue Jay, +; Am. Crow, +; House Sparrow, +. 1979: Eur. Starling, 3 (337, 136); Blue Jay, 1; Am. Robin, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; House Sparrow, +. 1980: Blue Jay, 1; Am. Robin, 1; Eur. Starling, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 0.5; Cedar Waxwing, +; Red-winged Blackbird, +; House Sparrow, +. 1981: Am. Robin, 1; Mourning Dove, +; Blue Jay, +; Cedar Waxwing, +; Chipping Sparrow, +; House Sparrow, +. **Total:** 1978: 9 species; 6.5 territorial males ($786/\text{km}^2$, 295/100 acres). 1979: 6 species; 7 territorial males ($786/\text{km}^2$, 318/100 acres). 1980: 9 species; 5.5 territorial males ($618/\text{km}^2$, 250/

100 acres) 1981: 6 species, 1 territorial male ($112/\text{km}^2$, 45/100 acres). **Remarks:** The decrease over time in the number of breeders is probably due to deterioration of the habitat.

43. URBAN YOUNG ASH-HAWTHORN WOODLOT. — **Location:** Ontario, Peel Co., Mississauga; Paisley Blvd., app. 1 km E of Mavis Rd.; $43^\circ 34' \text{N}$, $79^\circ 37' \text{W}$. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.3 ha = 3.3 acres (rectangular, 140 × 115 yds). **Description of Plot:** The canopy of this young woodlot is heavily dominated by White Ash, with some Shagbark Hickory and White Oak. Ash and hawthorn are the principal understory elements along with a few young Am. Elm. A fitness trail with exercise stations has been incorporated into the plot. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 164/acre. Total basal area: 46 ft^2/acre . Species comprising 90% of the total number of trees: White Ash, 93, 57, 48, 100; hawthorn, 40, 24, 10, 50; Shagbark Hickory, 15, 9, 21, 67. Trees by diameter size class: A (3-6 in.) 115, 70, 12, 25; B (6-9 in.) 18, 11, 6, 12; C (9-15 in.) 25, 15, 20, 43; D (15-21 in.) 5, 3, 9, 20. Shrub stems/acre 6183; ground cover 58%; canopy cover 51%; average canopy height 43 ft (range 20-63 ft). **Edge:** Bordered mostly by older homes with well vegetated lots. Cultivated low shrubbery borders app $\frac{1}{3}$ of plot. Cooksville Creek runs within 200 m of plot to the S. **Topography:** Flat. **Elevation:** 340 ft. **Weather:** Mild, calm, mostly sunny. **Coverage:** 1980: May 16-July 2; 0600-1000 hrs. 7 obs.-hours. **Census:** Eur. Starling, 6 (275, 111); Am. Robin, 3 (137, 56); Com. Grackle, 2.5; Blue Jay, 2; Gray Catbird, 2, N Cardinal, 2; Song Sparrow, 2; Am. Crow, 1.5; N. Flicker, 1; Black-capped Chickadee, 1; Canada Warbler, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 1; Mourning Dove, 0.5; House Sparrow, +. **Total:** 15 species; 26.5 territorial males ($1213/\text{km}^2$, 491/100 acres).

Beech, 17, 11, 9, 29; Black Cherry, 17, 11, 10, 29; willow, 16, 10, 13, 14; N. Red Oak, 9, 6, 4, 43; E. Hemlock, 9, 6, 4, 43; White Birch, 7, 5, 2, 43; hawthorn, 4, 3, 4, 29; Red Maple, 4, 3, 7, 14; Austrian Pine, 4, 3, 3, 29; dead trees, 3, 2, 6, 29. Trees by diameter size class: A (3-6 in.) 47, 31, 5, 4; B (6-9 in.) 43, 28, 13, 10; C (9-15 in.) 34, 22, 27, 21; D (15-21 in.) 16, 10, 28, 22; E (21-27 in.) 10, 6, 31, 24; F (27-33 in.) 3, 2, 14, 11; G (33-40 in.) 1, 1, 10, 8. Shrub stems/acre 5650; ground cover 51%; canopy cover 71%; average canopy height 43 ft (range 20-63 ft). **Edge:** Bordered mostly by older homes with well vegetated lots. Cultivated low shrubbery borders app $\frac{1}{3}$ of plot. Cooksville Creek runs within 200 m of plot to the S. **Topography:** Flat. **Elevation:** 340 ft. **Weather:** Mild, calm, mostly sunny. **Coverage:** 1980: May 16-July 2; 0600-1000 hrs. 7 obs.-hours. **Census:** Eur. Starling, 6 (275, 111); Am. Robin, 3 (137, 56); Com. Grackle, 2.5; Blue Jay, 2; Gray Catbird, 2, N Cardinal, 2; Song Sparrow, 2; Am. Crow, 1.5; N. Flicker, 1; Black-capped Chickadee, 1; Canada Warbler, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 1; Mourning Dove, 0.5; House Sparrow, +. **Total:** 15 species; 26.5 territorial males ($1213/\text{km}^2$, 491/100 acres).

45. URBAN OAK-MAPLE-ASH WOODLOT. — **Location:** Ontario, Peel Co., Mississauga; 0.6 km S of the intersection of Queen Elizabeth Way and Mississauga Rd., $43^\circ 33' \text{N}$, $79^\circ 37' \text{W}$. **Continuity:** New (1978), 3 consecutive years. **Size:** 1.05 ha = 2.6 acres (roughly rectangular, 210 × 60 yds). **Description of Plot:** Mostly confined to the back lots of a row of single-family dwellings. The canopy is dominated by N. Red Oak, Red Maple and White Ash, with some Norway Spruce. Shrubbery and ground cover are fairly well developed. The standard vegetation survey was not done because a number of residents refused access for sampling purposes. Therefore, the following vegetation data should be regarded as subjective estimates. Shrub stems/acre 3000; ground cover 50%, canopy cover 75% average canopy height 50 ft (range 30-65 ft). **Edge:** Half surrounded by homes with mature yard vegetation; half bordered by lawn and schoolyard. **Topography:** Flat. **Elevation:** 320 ft. **Weather:** 1978: Mainly clear, warm, 1 windy day. 1979: Mainly clear, mild, 2 windy days. 1980: Mainly clear, mild and calm. **Coverage:** 1978: June 3-July 11; 0600-0930 hrs 2.6 obs.-hours. 1979: Apr. 23-July 2; 0600-0930 hours; 4.5 obs.-hours. 1980: May 9-July 2, 0600-0930 hrs; 4.5 obs.-hours. **Census:** 1978: Eur. Starling, 2; Com. Grackle, 1.5, Blue Jay, 1; Am. Robin, 1; Red-winged Blackbird, 1; N. Flicker, 0.5; Black-capped Chickadee, 0.5; N. Cardinal, 0.5; N. Oriole, 0.5; Downy Woodpecker, +; Am. Crow, +; House Sparrow, +. 1979: Blue Jay, 1; Am. Crow, 1; Am. Robin, 1; Eur. Starling, 1; Chipping Sparrow, 1; Com. Grackle, 1; House Sparrow, 1; Black-capped Chickadee, 0.5. 1980: Eur. Starling, 4 (380, 154), Am. Robin, 2; Com. Grackle, 2; N. Cardinal, 1.5, N. Flicker, 1; Black-capped Chickadee, 1,

Blue Jay, 0; 5, Am. Crow, +, House Sparrow, +. **Total: 1978:** 12 species, 8.5 territorial males ($808/\text{km}^2$, 327/100 acres). **1979:** 8 species; 7.5 territorial males ($713/\text{km}^2$, 288/100 acres). **1980:** 9 species; 12 territorial males ($1140/\text{km}^2$, 462/100 acres).

46. URBAN MAPLE-OAK-BIRCH WOODLOT. — **Location:** Ontario, Peel Co., Mississauga; Indian Valley Trail, 0.5 km SW of Hwy. 10; $43^\circ 33'N$, $79^\circ 36'W$. **Continuity:** New (1978); 3 consecutive years. **Size:** 2.3 ha = 5.6 acres (nearly rectangular, 360×70 yds). **Description of Plot:** This is an especially rich plot, both floristically and structurally. The canopy is dominated by N. Red Oak, Red Maple and Paper Birch with the latter 2 species increasing at the subcanopy level. Of the 20-odd other natives present, the most prominent are Black Cherry, E. White Pine and White Oak. The shrubbery is dominated by Black Cherry and Witch-hazel. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 240/acre. Total basal area: 219 ft^2/acre . Species comprising 90% of the total number of trees: Red Maple, 99, 41, 35, 100; White Birch, 50, 21, 20, 100; Red Oak, 43, 18, 35, 100; E. White Pine, 7, 3, 2, 43; Black Cherry, 7, 3, 2, 57; White Oak 6, 2, 2, 29; dead trees, 4, 2, 1, 43. Trees by diameter size class: A (3-6 in.) 60, 25, 6, 3; B (6-9 in.) 44, 18, 13, 6; C (9-15 in.) 77, 32, 62, 28; D (15-21 in.) 46, 19, 82, 38; E (21-27 in.) 6, 2, 18, 8; F (27-33 in.) 6, 2, 28, 13; G (33-40 in.) 1, 1, 10, 5. Shrub stems/acre 6650; ground cover 37%; canopy cover 83%; average canopy height 66 ft (range 57-73 ft). **Edge:** This woodlot is situated across the back yards of a row of homes in an old, well vegetated neighborhood, 0.5 km from Credit River. **Topography:** Flat. **Elevation:** 300 ft. **Weather:** 1978: Partly cloudy, calm, light breezes. 1979: Mild, variable clouds, windy 2 days. 1980: Mild, partly cloudy, moderate breezes on 3 trips. **Coverage:** 1978: June 3-July 11; 0600-0930. 5.2 obs.-hours. 1979: Apr. 18-July 4; 0600-0930. 6.5 obs.-hours. 1980: May 9-July 2; 0600-0930. 9.5 obs.-hours. **Census:** 1978: Black-capped Chickadee, 2; Eur. Starling, 2; Com. Grackle, 2; Blue Jay, 1.5; Am. Robin, 1.5; Downy Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; N. Cardinal, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; N. Flicker, 0, 5, N. Oriole, 0.5; House Sparrow, +. **1979:** Eur. Starling, 3 (132, 54); Cedar Waxwing, 2; Am. Robin, 1.5; Com. Grackle, 1.5; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; Red-eyed Vireo, 1; N. Cardinal, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; House Sparrow, +. **1980:** Eur. Starling, 3.5 (154, 63); Blue Jay, 2; Am. Robin, 2; Com. Grackle, 2; Black-capped Chickadee, 1.5; Red-winged Blackbird, 1.5; Mourning Dove, 1; Downy Woodpecker, 1; N. Flicker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; N. Cardinal, 1; Brown-headed Cowbird (♀), 1; White-breasted Nuthatch, 0.5; House Sparrow, +. **Total: 1978:** 15 spe-

cies, 17 territorial males ($750/\text{km}^2$, 304/100 acres). **1979:** 15 species, 18 territorial males ($794/\text{km}^2$, 321/100 acres). **1980:** 16 species; 21 territorial males ($927/\text{km}^2$, 375/100 acres).

47. URBAN MAPLE-ASH WOODLOT. — **Location:** Ontario, York Co., Etobicoke; Kipling Ave., 1 block N of Eglinton Ave.; $43^\circ 41'N$, $79^\circ 33'W$. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.9 ha = 4.7 acres (nearly rectangular, 180×120 yds). **Description of Plot:** The dominant canopy species are Sugar Maple, N. Red Oak, White Ash and Am. Basswood, with some E. White Pine. The subcanopy consists mainly of Sugar Maple, Am. Beech, White Ash, Red Maple and Am. Hophornbeam. The shrubbery is dominated by Chokecherry and saplings of ash and Sugar Maple. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 153/acre. Total basal area: 135 ft^2/acre . Species comprising 94% of the total number of trees: Sugar Maple, 43, 28, 25, 100; White Ash, 21, 14, 18, 100; Am. Beech, 21, 14, 6, 71; Am. Basswood, 19, 12, 16, 57; E. White Pine, 10, 7, 7, 29; Am. Hophornbeam, 10, 7, 2, 29; N. Red Oak, 9, 6, 17, 57; Red Maple, 9, 6, 5, 57. Trees by diameter size class: A (3-6 in.) 31, 21, 3, 2; B (6-9 in.) 26, 17, 8, 6; C (9-15 in.) 64, 42, 51, 38; D (15-21 in.) 23, 15, 41, 30; E (21-27 in.) 6, 4, 18, 3; F (27-33 in.) 3, 2, 14, 10. Shrub stems/acre 7100; ground cover 55%; canopy cover 61%; average canopy height 56 ft (range 40-68 ft). **Edge:** Bordered by school, lawns and roads. A 1.5-ha woodlot (next census) lies 70 m to the S. **Topography:** Flat. **Elevation:** 500 ft. **Weather:** 1979: Clear, mild, calm. 1980: Partial cloud, usually cool and breezy, 1 rainy trip. **Coverage:** 1979: May 19-June 25; 0600-0930. 2.5 obs.-hours. 1980: May 5-July 2; 0600-0930. 4.6 obs.-hours. **Census:** 1979: Eur. Starling, 6 (412, 167); Red-tailed Hawk, 1; Am. Crow, 1; Com. Grackle, +; House Sparrow, +. **1980:** Eur. Starling, 3 (206, 83); Com. Grackle, 1.5; N. Flicker, 1; E. Wood-Pewee, 1; Blue Jay, 1; Mourning Dove, +; Am. Crow, +; Red-winged Blackbird, +; House Sparrow, +. **Total: 1979:** 5 species; 8 territorial males ($549/\text{km}^2$, 222/100 acres). **1980:** 9 species, 7.5 territorial males ($515/\text{km}^2$, 208/100 acres).

49. URBAN MAPLE-OAK-BEECH WOODLOT. — **Location:** Ontario, York Co., Etobicoke; Eglinton Ave., 0.7 km E of Kipling Ave.; $43^\circ 41'N$, $79^\circ 32'W$. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.05 ha = 2.6 acres (rectangular, 180×70 yds). **Description of Plot:** The canopy is dominated by Sugar Maple, Red Maple, N. Red Oak and Am. Beech. Black Cherry, White Oak, E. White Pine and Am. Hophornbeam are also present in the canopy. The understory is primarily Sugar Maple and Chokecherry with patches of Am. Beech. Most of the floor is quite bare and heavily compacted. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 211/acre. Total basal area: 173 ft^2/acre . Species comprising 88% of the total number of trees: Sugar Maple, 95, 45, 24, 100; Black Cherry, 25, 12, 10, 83; Am. Beech, 22, 10, 10, 50; Red Maple, 12, 6, 18, 67; White Oak, 8, 4, 3, 17; dead trees, 7, 3, 7, 33; E. White Pine, 3, 2, 5, 33; N. Red Oak, 3, 2, 16, 33; Am. Hophornbeam, 5, 2, 3, 33. Trees by diameter size class: A (3-6 in.) 102, 48, 10, 6; B (6-9 in.) 30, 14, 9, 5; C (9-15 in.) 40, 19, 32, 18; D (15-21 in.) 18, 9, 33, 19; E (21-27 in.) 12, 6, 36, 21; F (27-33 in.) 5, 2, 25, 14; G (33-40 in.) 2, 1, 11, 7; H (>40 in.) 2, 1, 17, 10. Shrub stems/acre 3925; ground cover 31%, canopy cover 90%; average canopy height 65 ft (range 41 to 81 ft). **Edge:** Sandwiched between a busy thoroughfare on the S and an older, well-treed subdivision to the N; lawn area extends E and W. **Topography:** Flat. **Elevation:** 500 ft. **Weather:** 1979: Clear, mild, calm. 1980: Partial cloud, usually cool and breezy, 1 rainy trip. **Coverage:** 1979: May 19-June 25; 0600-0930. 2.5 obs.-hours. 1980: May 5-July 2; 0600-0930. 4.3 obs.-hours. **Census:** 1979: Eur. Starling, 5 (475, 192); N. Cardinal, 1; Rose-breasted Grosbeak, 1; Am. Robin, 0.5; Com. Grackle, +; House Sparrow, +. **1980:** Eur. Starling, 5 (475, 192); Blue Jay, 1; Am. Crow, 1; Com.

Gackle, 1; Am. Robin, 0.5; N. Cardinal, +; House Sparrow, +. **Total:** 1979: 6 species, 7.5 territorial males ($713/\text{km}^2$, 288/100 acres). **1980:** 7 species; 8.5 territorial males ($808/\text{km}^2$, 327/100 acres).

50. URBAN OAK-CHERRY WOODLOT. — **Location:** Ontario, York Co., Etobicoke; Kipling Ave., 1.3 km S of Eglinton Ave.; $43^\circ 40' \text{N}$, $79^\circ 33' \text{W}$. **Continuity:** New (1979); 3 consecutive years. **Size:** 2.4 ha = 5.9 acres (rectangular with 'panhandle', 235 \times 120 yds on average). **Description of Plot:** The dominant canopy trees are N. Red Oak, Red Maple, Black Cherry, and White Oak with lesser amounts of White Ash, hawthorn and at least 10 other species. Most prominent in the understory are Black Cherry, Choke-cherry, hawthorn and ash with patches of raspberry and Witch-hazel. The woodlot is remarkably rich both floristically and structurally, especially in view of heavy neighbourhood use over several decades. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 180/acre. Total basal area: 188 ft^2/acre . Species comprising 91% of the total number of trees: Black Cherry, 81, 45, 18, 100; White Ash, 23, 13, 6, 88; Red Maple, 20, 11, 22, 50; hawthorn, 14, 8, 2, 50; White Oak, 13, 7, 18, 38; N. Red Oak, 13, 7, 28, 63. Trees by diameter size class: A (3-6 in.) 71, 40, 7, 4; B (6-9 in.) 29, 16, 9, 5; C (9-15 in.) 36, 20, 29, 15; D (15-21 in.) 21, 12, 38, 20; E (21-27 in.) 14, 8, 43, 23; F (27-33 in.) 15, 3, 25, 13; H (>40 in.) 4, 2, 38, 20. Shrub stems/acre 4838; ground cover 40%; canopy cover 69%; average canopy height 57 ft (range 33-68 ft). **Edge:** Located within an older well-treed residential neighbourhood. A public lawn area buffers between the plot and the houses on 2 sides. **Topography:** Essentially flat. **Elevation:** 480 ft. **Weather:** 1979: Mainly clear, warm, calm. 1980: Cool, partly cloudy, 1 windy trip. 1981: Cloudy, warm, calm. **Coverage:** 1979: May 20-July 6; 0600-0930 hrs. 16 obs.-hours. 1980: May 5-July 2; 0600-0930 hrs. 16.3 obs.-hours. 1981: May 26 and June 10; 0615-0930. 5.5 obs-hours. **Census:** 1979: Eur. Starling, 7 (293, 119); Com. Grackle, 4 (168, 68); N. Flicker, 2; N. Cardinal, 2; N. Oriole, 2; Downy Woodpecker, 1; E. Wood-Pewee, 1; Blue Jay, 1; Am. Crow, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Am. Robin, 1; Gray Catbird, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; Great Crested Flycatcher, 0.5; House Sparrow, +. 1980: Eur. Starling, 9 (377, 153); N. Flicker, 2; Blue Jay, 2; Am. Robin, 2; N. Cardinal, 2; Com. Grackle, 2; Brown-headed Cowbird (♀), 2; Gray Catbird, 1.5; Downy Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Red-winged Blackbird, 1; N. Oriole, 1; Black-capped Chickadee, +; Rose-breasted Grosbeak, +; House Sparrow, +. 1981: Eur. Starling, 7 (293, 119); N. Flicker, 2; Am. Robin, 2; Cedar Waxwing, 2; Com. Grackle, 1.5; Downy Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Am. Crow, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Red-winged Blackbird, 1; N. Oriole, 1; Black-capped Chickadee, +; Rose-breasted Grosbeak, +; House Sparrow, +.

Crow, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Gray Catbird, 1; N. Cardinal, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; Am. Goldfinch, 1; House Sparrow, +. **Total:** 1979: 18 species; 28.5 territorial males ($1194/\text{km}^2$, 483/100 acres). **1980:** 19 species; 30.5 territorial males ($1277/\text{km}^2$, 517/100 acres). **1981:** 19 species; 27.5 territorial males ($1152/\text{km}^2$, 466/100 acres).

51. URBAN HICKORY-MAPLE WOODLOT. — **Location:** Ontario, Peel Co., Bramalea; From Hwy 7, Dixie Rd. N 2 km, E on N. Park Dr., N on Mackay St.; $43^\circ 44' \text{N}$, $79^\circ 45' \text{W}$. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.9 ha = 4.7 acres (roughly rectangular, 170 \times 130 yds). **Description of Plot:** The canopy is dominated by Shagbark Hickory, Sugar Maple and White Ash with some Am. Beech. Maples are dominant in the subcanopy and shrub layer along with Am. Beech, White Ash, and hawthorn. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 241/acre. Total basal area: 123 ft^2/acre . Species comprising 92% of the total number of trees: Shagbark Hickory, 110, 46, 42, 100; Sugar Maple, 79, 33, 25, 75; White Ash, 18, 7, 21, 63; Am. Beech, 15, 6, 6, 38. Trees by diameter size class: A (3-6 in.) 65, 27, 7, 5; B (6-9 in.) 85, 35, 26, 21; C (9-15 in.) 75, 31, 60, 49; D (15-21 in.) 15, 6, 27, 22; E (21-27 in.) 1, 1, 4, 3. Shrub stems/acre 4513; ground cover 36%; canopy cover 78%; average canopy height 55 ft (range 37-64 ft). **Edge:** Brand new homes on half of perimeter. Extensive lawn borders rest of plot. 0.8 ha woodlot described in next census lies 100 m W. Small lake 600 m E. **Topography:** Flat. **Elevation:** 780 ft. **Weather:** 1979: Clear, mild, 1 day breezy. 1980: Often cloudy, windy and cool, rain 1 day. **Coverage:** 1979: May 11-Aug. 8; 0600-0930. 4.9 obs.-hours. 1980: May 8-July 4, 0600-0930. 5.3 obs.-hours. **Census:** 1979: Eur. Starling, 1.5; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Brown-headed Cowbird (♀), 1; Red-eyed Vireo, 0.5; Am. Goldfinch, 0.5; Blue Jay, +; Am. Crow, +; White-breasted Nuthatch, +; Rose-breasted Grosbeak, +; Indigo Bunting, +; Com. Grackle, +. 1980: Am. Robin, 1.5; E. Wood-Pewee, 1; Cedar Waxwing, 1; Eur. Starling, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Am. Goldfinch, 1; Brown-headed Cowbird (♀), 0.5; Song Sparrow, +; N. Oriole, +. **Total:** 1979: 13 species; 6.5 territorial males ($845/\text{km}^2$, 342/100 acres). **1980:** 10 species; 8 territorial males ($1040/\text{km}^2$, 421/100 acres).

Am. Hophornbeam are more prominent in the understory. Chokecherry dominates the shrub layer. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 309/acre. Total basal area 125 ft^2/acre . Species comprising 91% of the total number of trees: Shagbark Hickory, 137, 44, 43, 100; White Ash, 74, 24, 28, 100; Am. Basswood, 43, 24, 14, 100; Sugar Maple, 27, 9, 2, 71. Trees by diameter size class: A (3-6 in.) 90, 29, 9, 7; B (6-9 in.) 131, 43, 39, 31, C (9-15 in.) 80, 26, 64, 51; D (15-21 in.) 7, 2, 13, 10. Shrub stems/acre 5843; ground cover 68%; canopy cover 56%; average canopy height 54 ft (range 49-61 ft). **Edge:** Brand new townhouses and road on 80% of perimeter; lawn on the rest. 1.9 ha plot described in previous census is 100 m E. Small lake 700 m E. **Topography:** Flat. **Elevation:** 780 ft. **Weather:** 1979: Clear, mild, 1 day breezy. 1980: Often cloudy, windy and cool, rain 1 day. **Coverage:** 1979: May 11-Aug. 8; 0600-0930. 4.9 obs.-hours. 1980: May 8-July 4, 0600-0930. 5.3 obs.-hours. **Census:** 1979: Eur. Starling, 1.5; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Brown-headed Cowbird (♀), 1; Red-eyed Vireo, 0.5; Am. Goldfinch, 0.5; Blue Jay, +; Am. Crow, +; White-breasted Nuthatch, +; Rose-breasted Grosbeak, +; Indigo Bunting, +; Com. Grackle, +. 1980: Am. Robin, 1.5; E. Wood-Pewee, 1; Cedar Waxwing, 1; Eur. Starling, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Am. Goldfinch, 1; Brown-headed Cowbird (♀), 0.5; Song Sparrow, +; N. Oriole, +. **Total:** 1979: 13 species; 6.5 territorial males ($845/\text{km}^2$, 342/100 acres). **1980:** 10 species; 8 territorial males ($1040/\text{km}^2$, 421/100 acres).

53. URBAN HICKORY WOODLOT. — **Location:** Ontario, Peel Co., Bramalea, From Hwy 7, Dixie Rd. N 2 km, E on N. Park Dr., S on Manorcrest St.; $43^\circ 44' \text{N}$, $79^\circ 44' \text{W}$. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.6 ha = 3.9 acres (lima bean shaped, max. length 180 yds, min. width 90 yds). **Description of Plot:** The woodlot is dominated by medium-sized Shagbark Hickory, but saplings of this species are rare. The shrubbery is well developed with hawthorn, Slippery Elm and White Ash dominating. A temporary trickle courses through a hand-dug ditch in the S section. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 165/acre. Total basal area: 80 ft^2/acre . Species comprising 91% of the total number of trees: Shagbark Hickory, 115, 70, 74, 100; hawthorn, 21, 13, 3, 88; White Ash, 13, 8, 18, 63. Trees by diameter size class: A (3-6 in.) 51, 31, 5, 6; B (6-9 in.) 54, 33, 16, 20; C (9-15 in.) 55, 33, 44, 55; D (15-21 in.) 3, 2, 5, 6; E (21-27 in.) 1, 1, 4, 5; F (27-33 in.) 1, 1, 6, 8. Shrub stems/acre 9081; ground cover 53%; canopy cover 45%; average canopy height 46 ft (range 20-61 ft). **Edge:** Surrounded by new detached and row housing, gravel and lawn. 400 m from the 2 plots described immediately above. 750 m to small lake. **Topography:** Flat. **Elevation:** 750 ft. **Weather:** 1979: Clear, mild, 1 day breezy. 1980: Often cloudy, windy and cool, rain 1 day. **Coverage:** 1979: May 11-Aug. 8; 0600-0930. 4.9 obs.-hours. 1980: May 8-July 4, 0600-0930. 5.3 obs.-hours. **Census:** 1979: Eur. Starling, 1.5; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Brown-headed Cowbird (♀), 1; Red-eyed Vireo, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Cedar Waxwing, 1; Indigo Bunting, +; House Sparrow, +. 1980: Am. Goldfinch, 2; Am. Robin, 1.5; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; N. Flicker, +; Eur. Starling, +. **Total:** 1979: 13 species; 12.5 territorial males ($657/\text{km}^2$, 266/100 acres). **1980:** 12 species; 11.5 territorial males ($605/\text{km}^2$, 245/100 acres).

52. URBAN HICKORY-ASH-BASS-WOOD WOODLOT. — **Location:** Ontario, Peel Co., Bramalea; From Hwy 7, Dixie Rd. N 2 km, E on N. Park Dr., N on Mackay St.; $43^\circ 44' \text{N}$, $79^\circ 45' \text{W}$. **Continuity:** New (1979); 2 consecutive years. **Size:** 0.77 ha = 1.9 acres ('D' shaped, maximum dimensions—125 \times 90 yds). **Description of Plot:** The canopy dominants are Shagbark Hickory, Am. Basswood and White Ash. Sugar Maple and

cool, rain 1 day. **Coverage:** 1979: May 11-Aug 8, 0600-0930 5 5 obs.-hours. **1980:** May 11-July 4; 0600-0930. 6 obs.-hours. **Census:** 1979: Am. Robin, 2; Eur. Starling, 1 5, E. Wood-Pewee, 1; Blue Jay, 1; Song Sparrow, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; Am. Goldfinch, 1; Am. Crow, +; House Sparrow, +. **1980:** Red-winged Blackbird, 1.5; Blue Jay, 1, Am. Robin, 1; Song Sparrow, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; N Oriole, 1; Am. Goldfinch, 1; E. Wood-Pewee, +; Black-capped Chickadee, +; Eur. Starling, +; House Sparrow, +. **Total:** 1979: 10 species, 9.5 territorial males ($602/\text{km}^2$, 244/100 acres). **1980:** 12 species; 8.5 territorial males ($539/\text{km}^2$, 218/100 acres).

54. URBAN ASH-OAK WOODLOT.

— **Location:** Ontario, Halton Co., Burlington, 0.3 km NW of Hwy 2 and 1 km SW of Burloak Dr.; 43°22'N, 79°44'W. **Continuity:** New (1979); 2 consecutive years. **Size:** 1.2 ha = 3 acres (irregular shape, 230×50 yds on average). **Description of Plot:** The canopy and subcanopy are dominated by White Ash. Other important tree species are N. Red Oak, Red Maple, Am. Basswood, and Shagbark Hickory. The shrub layer is quite rich and woody stems are fairly evenly distributed among 25 species. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 280/acre. Total basal area: 101 ft²/acre. Species comprising 94% of the total number of trees: White Ash, 144, 52, 61, 86; N. Red Oak, 30, 11, 15, 71; Red Maple, 24, 9, 6, 71; Am. Basswood, 21, 8, 8, 86; hawthorn, 23, 8, 3, 14; Shagbark Hickory, 16, 6, 4, 71. Trees by diameter size class A (3-6 in.) 94, 34, 9, 9; B (6-9 in.) 123, 44, 37, 36; C (9-15 in.) 60, 21, 48, 47; D (15-21 in.) 1, 1, 3, 3; E (21-27 in.) 1, 1, 4, 4. Shrub stems/acre 9457; ground cover 39%; canopy cover 47%; average canopy height 46 ft (range 20-66 ft). **Edge:** Bordered by school-yards on 2 sides and by a residential subdivision on the other sides. The suburb is fairly well-vegetated. The nearest wooded area is quite small and over 0.5 km distant. Lake Ontario lies 400 m SE. **Topography:** Flat. **Elevation:** 280 ft. **Weather:** 1979: Mostly clear and warm but windy. 1980: Mostly clear, mild and calm. **Coverage:** 1979: May 18-July 1; 0600-0930. 3.5 obs.-hours. **1980:** May 6-June 26; 0600-0930. 4 obs.-hours. **Census:** 1979: N. Flicker, 1; Blue Jay, 1; Am. Crow, 1; Am. Robin, 1; Eur. Starling, 1; Com. Grackle, 1; House Sparrow, +. **1980:** E. Wood-Pewee, 1; Blue Jay, 1, Am. Crow, 1; Am. Robin, 1; Eur. Starling, 1; Song Sparrow, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Brown-headed Cowbird (♀), 1; N. Oriole, 1; Mourning Dove, 0.5; N. Cardinal, 0.5; Am. Goldfinch, +; House Sparrow, +. **Total:** 1979: 9 species; 8 territorial males ($659/\text{km}^2$, 267/100 acres). **1980:** 14 species; 11 territorial males ($906/\text{km}^2$, 367/100 acres). **Remarks:** The 1980 census is considered to be a more accurate assessment of the bird community because weather condi-

tions were much more favourable for bird censusing

55. URBAN MAPLE-OAK WOODLOT.

— **Location:** Ontario, Halton Co., Burlington; 0.5 km NW of Hwy 2 and 0.7 km SW of Appleby Line; 43°22'N, 79°45'W. **Continuity:** New (1979); 2 consecutive years. **Size:** 0.9 ha = 2.2 acres (rectangular, 120×90 yds). **Description of Plot:** The canopy is primarily Red Maple, N. Red Oak and Am. Beech, with occasional Shagbark Hickory and Black Cherry. The subcanopy is mainly Red Maple and Paper Birch with some White Ash, Silver Maple and Sassafras. The shrub layer is extremely sparse and is comprised mainly of subcanopy species. Over most of the plot, herbaceous ground cover is completely absent due to trampling. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 172/acre. Total basal area: 138 ft²/acre. Species comprising 90% of the total number of trees: Red Maple, 83, 49, 46, 100; Red Oak, 27, 16, 24, 67; Paper Birch, 15, 9, 5, 83; White Ash, 8, 5, 2, 50; Am. Beech, 8, 5, 11, 50; Sassafras, 8, 5, 3, 17; Black Cherry, 3, 2, 4, 33. Trees by diameter size class: A (3-6 in.) 28, 17, 3, 2; B (6-9 in.) 37, 21, 11, 8; C (9-15 in.) 77, 45, 61, 44; D (15-21 in.) 23, 14, 42, 30; E (21-27 in.) 7, 4, 21, 15. Shrub stems/acre 967; ground cover 31%; canopy cover 78%; average canopy height 55 ft (range 40-63 ft). **Edge:** A long established residential neighbourhood surrounds all sides. There is a small creek 350 m SW and Lake Ontario lies 750 m SE. **Topography:** Flat. **Elevation:** 280 ft. **Weather:** 1979: Mostly clear and warm but windy. 1980: Mostly clear, mild and calm. **Coverage:** 1979: May 18-July 1; 0600-0930. 3.5 obs.-hours. **1980:** May 6-June 26; 0600-0930. 4 obs.-hours. **Census:** 1979: N. Flicker, 1; Blue Jay, 1; Am. Crow, 1; Am. Robin, 1; Eur. Starling, 1; Com. Grackle, 1; House Sparrow, +. **1980:** Eur. Starling, 1.5; N. Flicker, 1; Blue Jay, 1; Am. Crow, 1; Am. Robin, 1; Com. Grackle, 1; N. Cardinal, 0.5; House Sparrow, +. **Total:** 1979: 7 species; 6 territorial males ($674/\text{km}^2$, 273/100 acres). **1980:** 8 species; 7 territorial males ($786/\text{km}^2$, 318/100 acres).

56. URBAN MAPLE-OAK-ASH WOODLOT.

— **Location:** Ontario, Halton Co., Burlington; NW from the Queen Elizabeth Way along Brant St. 1.5 km, S along Tyandaga Pk. to Westbury Dr.; 43°21'N, 79°50'W. **Continuity:** New (1978); 4 consecutive years. **Size:** 7 ha = 17.2 acres (roughly triangular, $520 \times 420 \times 390$ yds). **Description of Plot:** The canopy is dominated by Sugar Maple, N. Red Oak, White Oak, and White Ash, with some Shagbark Hickory and E. White Pine. From the subcanopy right down to the shrubbery, the vegetation is mostly Sugar Maple, White Ash and Am. Hop-hornbeam. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over: 186/acre. Total basal area: 108 ft²/acre. Species comprising 91% of the total number of trees: Sugar Maple, 51, 27,

24, 100, White Ash, 37, 20, 8, 80, Am. Hop-hornbeam, 29, 16, 5, 70, N. Red Oak, 19, 10, 22, 60; dead trees, 13, 7, 6, 50; White Oak, 9, 5, 24, 40; Shagbark Hickory, 8, 4, 6, 60; E. White Pine, 3, 2, 2, 30. Trees by diameter size class: A (3-6 in.) 95, 51, 10, 9; B (6-9 in.) 40, 22, 12, 11; C (9-15 in.) 25, 13, 20, 19; D (15-21 in.) 14, 8, 25, 23; E (21-27 in.) 10, 5, 31, 29; F (27-33 in.) 2, 1, 10, 9. Shrub stems/acre 3455; ground cover 42%; canopy cover 68%, average canopy height 54 ft (range 27-65 ft)

Edge: Fairly recently built detached homes border 40% of the perimeter; the rest is bordered by cropland. A 60-acre forest tract lies 400 m to the W, and just beyond that is the Niagara escarpment. **Topography:** There are a few shallow swales and a small stream which courses just within the S edge. There is also a temporary pond near the middle of the woodlot. **Elevation:** 450-490 ft. **Weather:** 1978: Essentially fair, warm and calm. 1979: Mild and breezy, often cloudy. 1980: Warm, calm, sometimes cloudy, 1 rainy day. 1981: Warm, generally cloudy, 1 day windy. **Coverage:** 1978: June 16-July 8; 0600-0930 hrs 21.5 obs.-hours. 1979: May 2-July 10; 0600-0930 hrs. 18 obs.-hours. 1980: May 6-July 5, 0600-0930 hrs. 23 obs.-hours. 1981: May 26-June 18; 0600-0930 hrs. 8 man-hours. **Census:** 1978: Eur. Starling, 7 (101, 41); Song Sparrow, 4.5 (65, 26); Black-capped Chickadee, 3 (43, 17); Am. Robin, 2.5; Downy Woodpecker, 2; N. Flicker, 2; Blue Jay, 2; Gray Catbird, 2; Com. Grackle, 2; Am. Goldfinch, 2; Cedar Waxwing, 1.5; N. Cardinal, 1.5; Indigo Bunting, 1.5; Red-tailed Hawk, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; White-breasted Nuthatch, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (♀), 1; Mourning Dove, 0.5; House Sparrow, +. 1979: Eur. Starling, 13 (187, 76); Am. Robin, 6 (86, 35); Song Sparrow, 4 (57, 23); Gray Catbird, 3 (43, 17); Black-capped Chickadee, 2.5; Am. Goldfinch, 2.5, N. Flicker, 2; Great Crested Flycatcher, 2, Blue Jay, 2; Am. Crow, 2; Cedar Waxwing, 2; N. Cardinal, 2; Brown-headed Cowbird (♀), 2; Red-winged Blackbird, 1.5; Red-tailed Hawk, 1; Downy Woodpecker, 1; E. Wood-Pewee, 1; Indigo Bunting, 1; Com. Grackle, 1; N. Oriole, 1; House Sparrow, +. 1980: Eur. Starling, 16 (230, 93); Am. Robin, 7 (101, 41); Gray Catbird, 5 (72, 29); Black-capped Chickadee, 4 (57, 23); Com. Grackle, 4; Song Sparrow, 3 (43, 17); Brown-headed Cowbird (♀), 3; Am. Goldfinch, 3; Red-winged Blackbird, 2.5; Downy Woodpecker, 2; N. Flicker, 2; Great Crested Flycatcher, 2, Blue Jay, 2; Am. Crow, 2; Cedar Waxwing, 2; N. Cardinal, 2; N. Oriole, 2; E. Wood-Pewee, 1; White-breasted Nuthatch, 1; Indigo Bunting, 1; Mourning Dove, 0.5; Chipping Sparrow, +; House Sparrow, +. 1981: Eur. Starling, 13 (187, 76); Com. Grackle, 6 (86, 35); Am. Robin, 5 (72, 29); Song Sparrow, 5, Gray Catbird, 4 (57, 23); Black-capped Chickadee, 3 (43, 17); Blue Jay, 2; Cedar Waxwing, 2; N. Cardinal, 2; Brown-headed Cowbird (♀), 2; N. Oriole, 2; Red-winged Blackbird, 1.5; Downy Woodpecker, 1; N. Flicker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Am. Crow, 1; White-breasted Nuthatch, 1; House Wren, 1; Am. Goldfinch,

1; Mourning Dove, 0.5; Red-tailed Hawk, +; Black-throated Blue Warbler, +; Chipping Sparrow, +; House Sparrow, +. **Total:** 1978: 22 species; 41 territorial males (589/km², 238/100 acres). 1979: 21 species; 52.5 territorial males (754/km², 305/100 acres). 1980: 23 species; 67 territorial males (963/km², 390/100 acres). 1981: 25 species; 56 territorial males (805/km², 326/100 acres). **Remarks:** The 1979 and 1980 censuses are the most reliable because visits were more frequent than in 1981 and better distributed throughout the season than in 1978. The 1978 census greatly underestimated starlings and robins since these early breeders had fledged young long before the first visit. The number of individuals recorded for 1981 is also an underestimate since the value is based on only 3 visits. However, there is a biological factor which stands out even against the background noise of sampling variation. When the Red-tailed Hawk ceased breeding on the plot after 1979, the numbers of species and individuals increased markedly.

57. SOFT MAPLE-HICKORY WOODLOT. — **Location:** Ontario: Kent Co.; approximately 4.5 mi (7.25 km) S of Wallaceburg; 42°31'25"N, 82°23'45"W. **Continuity:** New. **Size:** 14.3 ha = 35.3 acres. **Description of Plot:** The dominant canopy trees are Red Maple, Silver Maple, Pignut Hickory and Am. Basswood. Most prominent in the understory are Am. Hornbeam, hawthorn, Am. Elm, White Ash and Riverbank Grape. The ground cover is composed predominantly of Virginia Creeper, raspberry and Poison Ivy. A quantitative survey of the vegetation revealed the following results: Trees, 3-in. (8-cm) diameter and over, based on five 0.1 acre (0.04 ha) circular samples, 248/acre (620/ha); total basal area 94 ft²/acre (21.2 m²/ha). Species comprising 90% of the total number of trees [figures after each give number of trees/acre (trees/ha), relative density (%), relative dominance and frequency, in that sequence]: Red and Silver maples 66 (165), 27, 21, 100; Pignut Hickory 46 (115), 19, 19, 80; Am. Basswood 36 (90), 15, 19, 100; Shagbark Hickory 18 (45), 7, 8, 60; Am. Hornbeam 16 (40), 6, 3, 40; Hawthorn 12 (30), 5, 2, 80; Am. Elm 10 (25), 4, 1, 40; White Ash 8 (20), 3, 5, 60 and dead trees 16 (40), 6, 10, 100. Trees by diameter size class [figures after each give number of trees/acre (trees/ha), relative density (%), basal area in ft²/acre (m²/ha) and relative dominance]: A [3-6 in. (8-15 cm)] 146 (365), 59, 14.6 (3.3), 16; B [6-9 in. (15-23 cm)] 60 (150), 24, 18.0 (4.1), 19; C [9-15 in. (23-38 cm)] 22 (55), 9, 17.6 (4.0), 19; D [15-21 in. (38-53 cm)] 14 (35), 6, 25.2 (5.7), 27; E [21-27 in. (53-68 cm)] 6 (15), 2, 18.6 (4.2), 20. Shrub stems/acre (shrub stems/ha) 19,400 (48,500); ground cover 48%; canopy cover 94%; average canopy height 94.7 ft (28.7 m) [range 79.2-113.9 ft (24.0-34.5 m)]. **Edge:** Bordered on 2 sides by agricultural fields, on 1 by an old wooded pasture and on 1 by a single lane gravel road. **Topography:** Essentially flat. **Elevation:** 581 ft (177 m). **Weather:** Warm and dry. **Coverage:** May 25-June 27; between dawn and 0800 or 1930-2045

EST. Total obs.-hours: 17. **Census:** Wood Thrush, 12 (84, 34); House Wren, 9.5 (66, 27); Great Crested Flycatcher, 6 (42, 17); Am. Robin, 4 (28, 11); Blue Jay, 4; Com. Grackle, 4; E. Wood-Pewee, 3 (21, 8); Gray Catbird, 3; N. Cardinal, 3; N. Oriole, 2.5; Hairy Woodpecker, 2; N. Flicker, 2; Scarlet Tanager, 2; Rose-breasted Grosbeak, 2; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Blue-gray Gnatcatcher, 1. **Total:** 17 species; 62 territorial males (434/km², 176/100 acres). **Visitors:** Red-winged Blackbird, Brown-headed Cowbird, Yellow-billed Cuckoo, Mourning Dove, Eur. Starling, Red-eyed Vireo, Least Flycatcher, Yellow-bellied Flycatcher, Am. Goldfinch, E. Kingbird, Ovenbird, E. Screech Owl, Tree Swallow, Swainson's Thrush, Bay-breasted Warbler, Blackburnian Warbler, Chestnut-sided Warbler, Cedar Waxwing, Veery, Canada Warbler. **Remarks:** A Red-tailed Hawk was observed giving alarm calls near a nest in the woodlot prior to the initiation of the survey. No additional evidence of breeding was obtained.—DEBRA A. CHAMBERLAIN, MARK WIERCINSKI and JOHN NEWDICK, Canadian Wildlife Service, Environment Canada, 152 Newbold Cr., London, Ont., Canada.

58. WOODED CITY RAVINE. — **Location:** Ontario, York Co., Toronto, Moore Park Ravine, between Moore Ave., and Chorley Park; 43°41'N, 79°22'30"W. **Continuity:** Established 1966; 14 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 25-993 (1971). **Coverage:** April 24; May 1, 5, 15; June 7-8, 12, 14-15, 21, 23; July 4; 0630-0930. Total obs.-hours: 20. **Weather:** April-May, warm, sunny. Early June, cool cloudy, from June 14, hot and sunny. Average temp. for entire period, 64°F (45-80°). Ave. temp. June 14-July 4, 75°. **Census:** N. Cardinal, 6 (30, 12); Am. Robin, 5 (25, 10); Blue Jay, 3 (15, 6); Indigo Bunting, 3; Downy Woodpecker, 2; N. Flicker, 2; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Eur. Starling, 2; Com. Grackle, 2; Mourning Dove, 1; Scarlet Tanager, 1; Red-winged Blackbird, 1; N. Oriole, 1; House Sparrow, 1; E. Wood-Pewee, 0.5; Mourning Warbler, 0.5. **Total:** 17 species; 35 territorial males (175/km², 71/100 acres). **Remarks:** Changes in public management of this plot are: (a) more cutting out of dead and fallen trees, (b) widening to car width (with patrols) of the entire trail that forms the core of the area, and (c) periodic trimming of the growth on the fringe of the roadway. There is much increased use by runners and walkers. These changes show up most noticeably in: Downy Woodpecker, declining from 4 or 5 in the 70's to 2 this year; Wood Thrush, which averaged 4 per year from 1971 to 1979, averaged 1.6 in the last 4 years, and ended this year with only 1 registration; and N. Oriole, down from 37 registrations in 1978 to 4. This trend was signalled in earlier years by the catbird, which showed 1 territorial male in 1981 and in 1982, but only 1 this year. The above-mentioned factors seem to be a greater influence in this year's bird population than changes in overall

growth which has actually continued to fill in, producing more suitable habitat, except along the trail. Also, these decreases continued despite the warmer weather this year.—ERIC NASMITH (compiler), 28 Donwoods Drive, Toronto, Ont., Canada M4N 2G1.

59. MOIST DECIDUOUS FOREST.

Location: Michigan; Midland Co., 0.25 mi N of intersection of Pine River Road and Hubert Road; 43°36'N, 84°18'W, Gordonville Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (250 × 400 m, surveyed in a 50 × 50 m grid; marked using a 50 m line and compass). **Description of Plot:** The dominant canopy trees are N. Red Oak, Bur Oak, Red Maple, and Bigtooth Aspen. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 10 circular 0.1 acre samples, 205/acre; total basal area 68.6 ft²/acre. Species comprising 100% of the total number of trees: N. Red Oak, 12, 6, 13, 40; Bur Oak, 10, 5, 12, 50; Red Maple, 32, 16, 11, 90; Bigtooth Aspen, 34, 17, 10, 50; Green Ash, 22, 11, 9, 30; Silver Maple, 8, 4, 8, 30; Paper Birch, 19, 9, 7, 60; Quaking Aspen, 20, 10, 6, 60; Scarlet Oak, 3, 1, 5, 20; Swamp White Oak, 6, 3, 4, 20; E. Hemlock, 5, 2, 3, 20; E. Cottonwood, 2, 1, 3, 20; E. White Pine, 9, 4, 2, 60; Am. Basswood, 7, 3, 2, 20; Black Maple, 2, 1, 1, 10; Am. Elm, 10, 5, 1, 40; Shagbark Hickory, 1, >1, 1, 10; Black Cherry, 1, >1, >1, 10; Am. Beech, 2, 1, >1, 20. Trees by diameter size class: A (3-6 in.) 110, 54, 14, 100; B, 38, 18, 14, 100; C, 45, 22, 45, 100; D, 12, 6, 27, 60. Shrub stems per acre, 1275. The shrub layer consisted of Witch-hazel and Am. Hornbeam. Canopy cover, 78%; ground cover, 39%; average canopy height, 40 ft (range 30-60 ft). **Edge:** Bordered by similar forest on 3 sides. Small Jack Pine stand along E side. **Topography:** Flat. **Elevation:** 620 ft. **Weather:** Temp. range, 35-70°F during census hours. **Coverage:** April 26; May 9-10, 22, 25-26; June 1, 3, 5, 8, 14, 30; between dawn and 1100 or 1900-2130 hours. Total obs.-hours: 26. **Census:** Ovenbird, 4 (40, 16); Great Crested Flycatcher, 3 (30, 12); Black-capped Chickadee, 3; N. Cardinal, 3; E. Wood-Pewee, 2.5; White-breasted Nuthatch, 2.5; N. Flicker, 2; Red-eyed Vireo, 2; Scarlet Tanager, 2; Hairy Woodpecker, 1.5; Am. Robin, 1.5; Ruffed Grouse, 1; Red-bellied Woodpecker, 1; Brown-headed Cowbird, 1; N. Oriole, 1; Blue Jay, 0.5. **Total:** 16 species; 31.5 territorial males (315/km², 128/100 acres).



BBC 59. Midland Co., Mich. Moist Deciduous Forest. Photo/C. Francke.

Visitors: Wood Duck, Am. Woodcock, Great Horned Owl, Downy Woodpecker, Least Flycatcher, Tufted Titmouse, Brown Creeper, Veery, Wood Thrush, Am. Redstart, Rose-breasted Grosbeak, Indigo Bunting, Com. Grackle. **Remarks:** Nest of Black-capped Chickadee located. A White-breasted Nuthatch was observed carrying either food or nesting material. Special thanks to Dave Dalgarn for the habitat analysis and to Skip Mott, Win Shaughnessy, Phil Stephens, and John Wardwell for assistance.—*CHIP FRANCKE, Chippewa Nature Center, 400 S. Badour Rd., Midland, MI 48640.*

60. MIXED DECIDUOUS SECOND GROWTH FLOODPLAIN FOREST. —

Location: Illinois; Cook Co., Cook County Forest Preserve District Evans Field acquisition in the Indian Boundary Division, between the Chicago suburbs of Elmwood Park and River Grove, bordering the W side of Thatcher Rd.; 41°52'N, 87°52'W, River Forest Quadrangle, USGS. **Continuity:** New. **Size:** 29.1 ha = 72 acres (irregular, survey provided by Cook Co. Forest Preserve Dist.).

Description of Plot: Located in a tract of forest preserve land that follows the Des Plaines River. The river curves around the S and W boundaries. Several hiking paths and a bridle trail wind through the area. Picnickers use a large mowed area along the E side. Most land was at one time cleared; the result now being a second growth forest, with some areas very downgraded and other less disturbed areas still of quite high quality. Much of the area is flooded periodically by the Des Plaines River after spring thaws and heavy rains. Overall, the plot is a very heterogeneous mixture of tree species but there are rather large areas of several acres in size of quite uniform growth, in types of species and age. There are a number of very large (>40 in. diameter) Bur Oak, N. Red Oak, and Crack Willow scattered throughout the plot. The dominant canopy trees are White Ash, Am. Elm, Am. Basswood, and Black Cherry. Most prominent understory tree, and in some areas making up close to 100% of all tree growth, is hawthorn. The most prominent shrubs are Eur. Buckthorn, honeysuckle, and Am. Elder. The groundcover is primarily Giant Ragweed, Wood Nettle, Virginia Knotweed, and Poison Ivy. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular 0.1 acre samples, 1332.8/acre; total basal area 277.5 ft²/acre. Species comprising 90% of the total number of trees (figures are number of trees/acre, relative density (%), relative dominance, frequency, respectively): Hawthorn, 515, 39, 19, 100; Am. Ash, 333, 25, 30, 83; Am. Elm, 100, 7, 9, 100; Am. Basswood, 90, 7, 6, 50; dead trees, 80, 6, 7, 100; Black Cherry, 35, 3, 2, 83; Black Ash, 32, 3, 3, 33. Trees by diameter size class (figures after each class are number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance, frequency, respectively): A (3-6 in.) 788, 59, 78.9, 18; B (6-9 in.) 352, 26, 106.2, 24; C (9-15 in.) 142.4, 11, 113.9, 26; D (15-21 in.) 27, 2, 49, 11; E (21-27 in.) 8, .6, 24.8, 6; F (27-



BBC 60, Cook Co., IL. Mixed Deciduous Second-growth Floodplain Forest. Photo/V. Byre.

33 in.) 10, 0.7, 47, 11; G (33-40 in.) 2, 0.1, 11, 3; H (>40 in.) 3, 0.2, 12.8, 3. The rather high number of trees estimated per acre is due to 2 factors: 1) the great number of small understory hawthorns just over 3 in. in diameter, and 2) the fact that the second growth vegetation, although very heterogeneous overall, tends to grow in large homogeneous masses of 2 species of tree. Shrub stems/acre 34,000; groundcover 85%, canopy cover 78%; average canopy height 43 ft (range 35-70). **Edge:** Border very irregular. Bordered on S and W sides by DesPlaines River with similar habitat on other side of river. Bordered on N side by similar forest and on the E by narrow band of trees (10-50 ft wide) which surrounds the 3 acre picnic grounds and parking lot. **Topography:** Essentially flat except for a slope which leads down into a former river bed which meanders N-S through the plot and joins the river. When the river is high, water backs up into this area. **Elevation:** 600-625 ft. **Weather:** Extremely cool and wet during May, one of the coldest on record; very hot during June and July. **Coverage:** Apr. 16, 23-24; May 1, 7-8, 15, 21, 28; June 4, 10, 12, 17, 19, 22, 26-27, 29; July 1, 3; 0530-1130 hours. Total obs.-hours: 89. **Census:** Am. Robin, 19 (65, 26); N. Cardinal, 13.5 (46, 19); Black-capped Chickadee, 13 (45, 18); Blue Jay, 12 (41, 17); Com. Grackle, 12; Eur. Starling, 11 (38, 15); Indigo Bunting, 7.5 (26, 10); Red-eyed Vireo, 6.5 (22, 9); House Wren, 6 (21, 8); Brown-headed Cowbird, 6; Amer. Crow, 5.5, (19, 8); Downy Woodpecker, 5 (17, 7); N. Flicker, 4.5 (15, 6); Gray Catbird, 4.5; Great Crested Flycatcher, 3.5 (12, 5); Rose-breasted Grosbeak, 3.5; Red-winged Blackbird, 2.5; Mallard, 1.5; E. Wood-Pewee, 1.5; N. Oriole, 1.5; Wood Duck, 1; Yellow-billed Cuckoo, 1; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Wood Thrush, 1; Brown Thrasher, 1; Scarlet Tanager, 1; Song Sparrow, 1. **Total:** 28 species; 148 territorial males or females (508/km², 206/100 acres). **Visitors:** Great

Blue Heron, Green-backed Heron, Canada Goose, Broad-winged Hawk, Am. Kestrel, Spotted Sandpiper, Mourning Dove, Black-billed Cuckoo, Chimney Swift, Belted Kingfisher, Barn Swallow, White-breasted Nuthatch, Cedar Waxwing, Tennessee Warbler, Am. Goldfinch, House Sparrow. **Remarks:** Nests located (14): Black-capped Chickadee, 2; Blue Jay, 1; Eur. Starling, 3; House Wren, 2; Downy Woodpecker, 1; N. Flicker, 4; Scarlet Tanager, 1. Many families of young Blue Jays, Am. Crow, Black-capped Chickadees, Am. Robins, and Com. Grackles gave evidence of nesting successes. The woods were flooded several times during May and June due to abnormally high amounts of rain. This may have affected the Mallard's nesting success. Several large Snapping Turtles (*Chelydra serpentina*) were observed in the woods and in the river. They are known to eat ducklings and may also be, in part, responsible for the scarcity of young Mallards.—*VICTORIA J. BYRE, 1811 N. Thatcher, Elmwood Park, IL 60635.*

61. OAK-HICKORY FOREST. —

Location: Illinois; Lake Co., Lake Co. 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:** Established 1981; 3 consecutive years. **Size:** 9.12 ha = 22.53 acres. **Description of Plot:** See AB 36:63-64 (1982). [Same as census in 1981 except that 40 m was added to the N, S, and E sides to increase sample size.] **Weather:** Normal temperatures with little precipitation. **Coverage:** June 8, 11-13, 17, 19, 21; 0615-0900. Total obs.-hours: 10.5. **Census:** Ovenbird, 6 (66, 27); Wood Thrush, 5.5 (60, 24); Black-capped Chickadee, 3 (33, 13); Am. Robin, 3; Brown-headed Cowbird, 3; Blue Jay, 2.5; Great Crested Flycatcher, 2; Veery, 2; Rufous-sided Towhee, 2; Red-winged Blackbird, 2; Com. Grackle, 2; Red-eyed Vir-



BBC 61, Lake Co., IL. Oak-Hickory Forest.

eo, 1.5; Am. Woodcock, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Hairy Woodpecker 1; E. Wood-Pewee; 1; White-breasted Nuthatch, 1; Brown Creeper, 1; House Wren, 1; Cedar Waxwing, 1; Canada Warbler, 1; N. Cardinal, 1; Scarlet Tanager, +; Rose-breasted Grosbeak, +. **Total:** 25 species; 45.5 territorial males ($499/\text{km}^2$, 202/100 acres). **Visitors:** N. Flicker, Am. Crow, Gray Catbird, Indigo Bunting. **Remarks:** Veery numbers were considerably lower this season and in 1982 than they were in either 1979 or 1981. Ovenbird and Wood Thrush numbers remained fairly high. This is the first time that Red-eyed Vireo has been known to nest in the upland portion of this woods. These trends indicate that MacArthur Woods is becoming more mature and less shrubby, however, this change is not discernible by the human eye. I thank the Lake County Forest Preserve District and the Illinois Nature Preserves Commission for permission to study this woods.—SCOTT HICKMAN, Biology Dept., College of Lake Co., 19351 W. Washington St., Grayslake, IL 60030.

62. OAK-MAPLE FOREST AND EDGE. — **Location:** Illinois; Champaign Co., Trelease Woods, 6.5 km NE of Urbana. **Continuity:** Established 1927; 45 intermittent years. **Size:** 24 ha = 59.3 acres, plus 2 km (1.24 mi) of forest edge. **Description of Plot:** Most recent 100% inventory (Pelz and Rolfe, 1977, *Trans. Ill. State Acad. Sci.* 69:446-454) yielded: Trees 6.6 cm dbh and over, 572 trees/ha; total basal area, $27.7 \text{ m}^2/\text{ha}$. Species comprising 90% of total number of trees [figures following each species are trees/ha, rel. den. (%), rel. dom. (%), freq. (%), in that order]: Sugar Maple 152, 27, 29, 99; Slippery Elm, 78, 14, 6, 100; Hackberry, 64, 11, 11, 97; Pawpaw 51, 9, 1, 70; Am. Basswood, 46, 8, 6, 91; White Ash, 34, 6, 12, 96; Ohio Buckeye, 32, 6, 5, 98; Downy Hawthorn, 19, 3, 1, 59; Black Walnut, 19, 3, 5, 78; Am. Horn-

beam, 18, 3, 1, 66; N. Red Oak, (6, 1, 9, 65) and Bur Oak, (9, 2, 5, 56) are also important members of this community. Trees by diameter size class [figures are trees/ha, rel. den. (%), basal area (m^2/ha), rel. dom. (%)]: A (6.6-16.5 cm) 148, 64, 14, 11; B (16.6-31.7 cm) 49, 21, 22, 18; C (31.8-62.2 cm) 27, 12, 48, 40; D (62.3-92.7 cm) 7, 3, 30, 25; E (92.8 + cm) 1, +, 7, 6. Saplings (less than 6.6 cm dbh) total 1494/ha, dominated by Pawpaw (32%), Sugar maple (29%), and Spicebush (10%). See also AFN 2:232-233 (1948). **Coverage:** April 22; May 5, 12, 20, 27; June 10, 16; July 1, 22; 0530-1200 hours, CDT. Total obs.-hours: 76. **Census:** *Forest Interior Species (#/km² and #/100 acres in parentheses):* House Wren, 11, (46, 19); E. Wood-Pewee, 8 (33, 13); Downy Woodpecker, 6 (25, 10); Great Crested Flycatcher, 6; Red-bellied Woodpecker, 5 (21, 8); Wood Thrush, 5; Yellow-billed Cuckoo, 4 (17, 7); Red-eyed Vireo, 4; Hairy Woodpecker, 2; White-breasted Nuthatch, 2; Great Horned Owl, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Acadian Flycatcher, +. *Forest-edge Species (#/km and #/mi. in parentheses):* Eur. Starling, 39 (20, 31); Am. Robin, 27 (14, 22); Indigo Bunting, 16 (8, 13); N. Cardinal, 11 (6, 9); Blue Jay, 8 (4, 6); Red-headed Woodpecker, 7 (4, 6); N. Flicker, 6 (3, 5); Gray Catbird, 5 (3, 4); Brown Thrasher, 4 (2, 3); Com. Yellowthroat, 3 (2, 2); Field Sparrow, 1; Am. Goldfinch, 1; Ring-necked Pheasant, +; Am. Woodcock, +; Mourning Dove, +; Rose-breasted Grosbeak, +; Com. Grackle, +; Brown-headed Cowbird, +, N. Oriole, +. **Total:** 14 forest interior species, 56 territorial males ($233/\text{km}^2$, 94/100 acres). 19 forest-edge species; 128 + territorial males (64 + /km, 103 + /mi). **Remarks:** Numbers of male robins (27) and cardinals (11) are largest ever. Number of Mourning Doves is lowest since 1952.—DAVID J. TAZIK and ROBERT E. SZAFONI, Shelford Vivarium, Univ. of Ill., Champaign, IL 61820.

63. NEOTOMA VALLEY. — **Location:** Ohio; Hocking Co., Good Hope Twp., NW 1/4, Sec. 16, T13N, R18W; about 39°36'N, 82°34'W, Rockbridge Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** About 20.2 ha = 50 acres. **Description of Plot:** See AB 33:37-38 (1979). **Habitat changes:** The clear-cut, seeded strip on the western border vegetated well with pioneer plants. Less erosion of soil into the census area was noticed. The presence of this major edge, however, produced no measurable effect upon the density, although non-breeding pairs used the edge. **Weather:** see census 91. **Coverage:** June 4-6. Total obs.-hours: 80 (by members or guests of the Wheaton Club). **Census:** Red-eyed Vireo, 9 (44, 18); Wood Thrush, 8 (40, 16); Scarlet Tanager, 8; Acadian Flycatcher, 6 (30, 12); Ovenbird, 6; E. Wood-Pewee, 4 (20, 8); Red-bellied Woodpecker, 3 (15, 6); Downy Woodpecker, 3; Tufted Titmouse, 3; White-breasted Nuthatch, 3; Cerulean Warbler, 3; Black-and-white Warbler, 3; N. Cardinal, 3; Yellow-billed Cuckoo, 2; Great Crested Flycatcher, 2; Blue Jay, 2; Blue-gray Gnatcatcher, 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; Hairy Woodpecker, 1; N. Flicker, 1; Pileated Woodpecker, 1; E. Phoebe, 1; Carolina Chickadee, 1; Gray Catbird, 1; Louisiana Waterthrush, 1; Summer Tanager, 1; Indigo Bunting, 1; Brown-headed Cowbird, 1. **Total:** 34 species; 91 pairs ($450/\text{km}^2$, 182/100 acres). **Remarks:** No cowbird eggs or young were observed; Least Flycatcher present may have been a late migrant; only 6 nests discovered, which was much below expectations.—A. H. CLAUGUS (compiler), 228 S. Lake St., Carey, OH 43316.



BBC 63, Good Hope Twp., Hocking Co., Ohio. Neotoma Valley. Photo/A. H. Claugus.

64. MIXED DECIDUOUS FOREST.—

Location: Tennessee; Washington Co., Horse Cove Gap, about 4.5 mi S of Johnson City; 36°15'N, 82°22'W, Erwin Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 25.4 ha = 62.7 acres. **Description of Plot:** See AB 37:66-67 (1983). **Coverage:** May 18, 21, 24, 27-28; June 3, 6, 12, 18, 26; 0545-1000, EDT. Total obs.-hours: 10. **Census:** Red-eyed Vireo, 14, (55, 22); Ovenbird, 12 (47, 19); Hooded Warbler, 8 (32, 13); Black-throated Green Warbler, 4 (16, 6); Carolina Chickadee, 3 (12, 5); Wood Thrush, 3; Blue-gray Gnatcatcher, 3; Black-and-white Warbler, 3; Scarlet Tanager, 3; Whip-poor-will, 2; Ruby-throated Hummingbird, 2; Acadian Flycatcher, 2; Tufted Titmouse, 2; Solitary Vireo, 2; Worm-eating Warbler, 2; Kentucky Warbler, 2; Ruffed Grouse, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1; Pileated Woodpecker, 0.5. **Total:** 22 species; 72.5 territorial males (286/km², 116/100 acres). **Remarks:** Ruffed Grouse hen with 10 chicks found.—RICHARD LEWIS, Rt. 3, Box 470, Bristol, TN 37620.

65. UPLAND HARDWOOD FOREST I.—

Location: Tennessee, Maury Co., 0.2 mi S of Duck River at mi 138 near Columbia; 35°35'30"N, 86°59'45"W, Glendale Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres. **Description of Plot:** The dominant canopy trees are elm, Shagbark Hickory, ash, Chestnut Oak, and Sugar Maple. Most prominent in the understory are seedlings of elm, Coralberry, Strawberry-bush, Sugar Maple, ash, hickory, and Chestnut Oak. Ground cover is primarily Japanese Honeysuckle, grass, Small-flowered Leafcup, Virginia Creeper, elm, Poison Ivy, and Coralberry. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 5 0.1 acre circular plots, 232/acre;

total basal area 125 ft²/acre. Species constituting 100% of the total number of trees (figures after each species indicate number of trees/acre; relative density (%), relative dominance (%), frequency (%)) in that sequence): Elm, 56, 24, 11, 100; Sugar Maple, 44, 19, 8, 60; Shagbark Hickory, 30, 13, 28, 80; Chestnut Oak, 22, 9, 11, 60; ash, 20, 9, 7, 80; Sassafras, 18, 8, 3, 20; Scarlet Oak, 12, 5, 9, 60; Com. Persimmon, 10, 4, 2, 40; Hickory, 8, 3, 5, 60; E. Redcedar, 4, 2, 1, 40; Hackberry, 2, 1, 2, 20; E. Redbud, 2, 1, 1, 20; S. Red Oak, 2, 1, 12, 20; N. Red Oak, 2, 1, 1, 20. Trees by diameter size class (Figure after each class gives number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance (%)): A (3-6 in.) 134, 58, 33, 26; B (6-9 in.) 40, 17, 12, 10; C (9-15 in.) 38, 16, 30, 24; D (15-21 in.) 16, 7, 29, 23; E (21-27 in.) 2, 1, 6, 5; G (33-40 in.) 2, 1, 14, 11. Shrub stems/acre, 2900; ground cover, 79%; canopy cover, 68%; average canopy height, 73 ft (range 65-80 ft). **Edge:** Bordered on all sides by similar forest. Pastureland 0.1 mi E and 0.05 mi N, paved road 0.05 mi S of site. **Topography:** Relatively flat except for last 50 ft, which drops steeply with a northerly orientation. Fractured and eroded limestone outcroppings are dispersed throughout the site. **Elevation:** 680 ft. **Weather:** Clear to partly cloudy. Temp. range, 53-70°F. **Coverage:** June 6-10; 0600-0800, CST. Total obs.-hours: 10. **Census:** Blue Jay, 3 (49, 20); Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; Tufted Titmouse, 2; Carolina Wren, 2; Wood Thrush, 2; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Summer Tanager, 1; N. Cardinal, 1; Indigo Bunting, 1; Com. Grackle, 1; Pileated Woodpecker, +; Carolina Chickadee, +. **Total:** 17 species; 22 territorial males (362/km², 147/100 acres). **Visitors:** E. Wood-Pewee, House Wren, Gray Catbird, Yellow-throated Vireo, Yellow-throated Warbler, Brown-headed

Cowbird.—LINDA J. FOWLER and DALE K. FOWLER, Division of Land and Forest Resources, Tennessee Valley Authority, Norris, TN 37828.

66. UPLAND HARDWOOD FOREST II.—

Location: Tennessee, Maury Co., 0.3 mi NW of Duck River near Columbia; 35°34'20"N, 86°53'40"W, Glendale Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres. **Description of Plot:** The dominant canopy trees are Shagbark Hickory, Sugar Maple, and White Oak. Most prominent in the understory are seedlings of ash, elm, Sugar Maple, E. Redbud, and Red Mulberry. Ground cover is primarily Virginia Creeper, Poison Ivy, ash, grass, and E. Redbud. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 5 0.1-acre circular plots, 330/acre; total basal area, 84 ft²/acre. Species constituting 100% of the total number of trees (figures after each species indicate number of trees/acre; relative density (%), relative dominance (%), frequency (%)) in that sequence): Shagbark Hickory, 98, 30, 43, 100; Sugar Maple, 80, 24, 16, 100; Hickory, 70, 21, 18, 100; Elm, 20, 6, 3, 100; White Oak, 16, 5, 10, 60; Black Oak, 14, 4, 4, 20; E. Redcedar, Flowering Dogwood, 4, 1, 1, 40; Ash, 4, 1, 1, 40; Blackgum, 4, 1, 1, 20; Hackberry, 2, 1, 1, 20; Red Mulberry, 2, 1, 1, 20; Post Oak, 2, 1, 1, 20; N. Red Oak, 2, 1, 1, 20; Carolina Buckthorn, 2, 1, 1, 20. Trees by diameter size class (figure after each class gives number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance (%)): A (3-6 in.) 202, 61, 20, 24; B (6-9 in.) 84, 25, 25, 30; C (9-15 in.) 42, 13, 32, 39; E (21-27 in.) 2, 1, 6, 7. Shrub stems/acre, 2700; ground cover, 25%; canopy cover, 82%; average canopy height, 63 ft (range 55-70 ft). **Edge:** Bordered on all sides by similar habitat. Cedar forest 0.05 mi SE of site. **Topography:** Site lies on SW facing ridge with sides facing NW and SE. Scattered limestone outcroppings occur on NW slope. **Elevation:** 720 ft. **Weather:** Clear to partly cloudy. Temperatures ranged from 53-70°F. **Coverage:** June 6-10; 0600-0800 hours, CST. Total obs.-hours: 10. **Census:** Red-eyed Vireo, 3 (49, 20); Yellow-billed Cuckoo, 2; Blue Jay, 2; Wood Thrush, 2; Broad-winged Hawk, 1; Red-bellied Woodpecker, 1; Tufted Titmouse, 1; Summer Tanager, 1; Com. Grackle, 1; Hairy Woodpecker, +; Pileated Woodpecker, +. **Total:** 11 species; 14 territorial males (231/km², 93/100 acres). **Visitors:** Black Vulture, Am. Crow.—LINDA J. FOWLER and DALE K. FOWLER, Division of Land and Forest Resources, Tennessee Valley Authority, Norris, TN 37828.

67. 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; 17 intermittent years. **Size:** 10.52 ha = 26 acres. **Description of Plot:** See AFN 19:594-595 (1965). **Coverage:** June 6-7, 10-



BBC 65, Maury Co., Tenn. Upland Hardwood Forest I.

12, 17, 0445-2200 hrs Total obs -hours 16
Census: Ovenbird, 13 (124, 50); Red-eyed Vireo, 12.5 (119, 48); Veery, 10 (95, 38); Blackburnian Warbler, 10; Scarlet Tanager, 9 (86, 35); Black-throated Green Warbler, 8 (76, 31); Black-capped Chickadee, 5 (48, 19); Solitary Vireo, 5; Blue Jay, 3 (29, 12); Brown Creeper, 3; Hairy Woodpecker, 2; Great Crested Flycatcher, 2; Red-breasted Nuthatch, 2; Gray Catbird, 2; Pine Warbler, 2; Brown-headed Cowbird, 2; Broad-winged Hawk, 1.5; Acadian Flycatcher, 1.5; Com. Yellowthroat, 1.5; Barred Owl, 1; Downy Woodpecker, 1; N. Flicker, 1; Am. Crow, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Black-and-white Warbler, 1; Yellow-rumped Warbler, 1; Canada Warbler, 1; N. Cardinal, 1; Pileated Woodpecker, 0.5; N. Oriole, 0.5; Great Horned Owl, +; E. Bluebird, +; Blue-winged Warbler, +; Song Sparrow, +; Purple Finch, +. **Total:** 36 species; 106 territorial males ($1,007/\text{km}^2$, 408/100 acres).

Remarks: This year there was one notable change in this usually stable plot. The Blackburnian Warbler, which has been the dominant species and has greatly outnumbered the Black-throated Green Warbler for the last 10 years, fell from an all time peak of 18 last year to 10 this year while the Black-throated Green Warbler increased from 6 to 8. The Veery continued to outnumber the Wood Thrush, this year by 10 to 0. Last year's new single Acadian Flycatcher was joined by a second singer.—ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.

68. BURNED PINE-OAK FOREST. —
Location: Massachusetts; Plymouth Co., Pine Hills 0.5 mi S of Rte 3A; $41^\circ 56' \text{N}$, $70^\circ 35' \text{W}$, Manomet Quadrangle, USGS.
Continuity: New (but includes a 22.5 ha plot censused in 1975 (AB 29:1099-1100). **Size:** 56.0 ha = 138.4 acres (8 adjacent rectangles, each 350 × 200m, surveyed). **Description of Plot:** Almost completely burned by forest fire in 1957, the area has been virtually undisturbed since. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 410/acre; total basal area 78.8 ft²/acre. Tree species: Scarlet Oak, Black Oak, N. Red Oak, 258, 61, 53, 100; Pitch Pine, 27, 6, 9, 67; White Oak, 86, 21, 14, 106; E. White Pine, 32, 8, 19, 83; Red Maple, 16, 4, 4, 50. Most (93%) were live but some large standing dead trees still provided opportunities for cavity nesters. Trees by diameter size class: A (3-6 in.) 326, 78, 32.6, 43; B (6-9 in.) 62, 15, 18.7, 25; C (9-15 in.) 30, 7, 24.3, 32. Canopy cover was 58%, ranging from 9 to 56 ft (average 33 ft). Shrub stems/acre 2,068 (9% dead) with a 34% cover; ground cover averaged 57%, dominated by Black Huckleberry, Early Sweet Blueberry, Low Sweet Blueberry and Bracken. **Edge:** The habitat was uniform, although such trees as E. White Pine were in groves, rather than scattered randomly. **Topography:** Essentially flat, located on the crest of a terminal glacial moraine. The W end slopes steeply downhill. **Elevation:** 360 ft. **Weather:** Warm and dry, generally with clear skies during census; wind

0 or light NW, temp range, 57-80°F. **Coverage:** June 10-11, 13-14, 16-17, 20-21, 23-24, 27-30; July 5, 7-8, 11, 14, 18, 20-21, 25-27; between dawn and 0830. Total obs.-hours: 188. **Census:** Rufous-sided Towhee, 23.5 (42, 17); Ovenbird, 20 (36, 14); Pine Warbler, 15 (27, 11); Black-capped Chickadee, 10.5 (19, 8); Blue Jay, 8 (14, 6); Ruffed Grouse, 5.5 (10, 4); Com. Yellowthroat, 5 (9, 4); Hermit Thrush, 4.5 (8, 3); Scarlet Tanager, 3.5 (6, 3); Black-and-white Warbler, 3 (5, 2); Am. Woodcock, 2; Downy Woodpecker, 2; N. Flicker, 2; Great Crested Flycatcher, 2; Prairie Warbler, 1.5; Red-tailed Hawk, 1; N. Bobwhite, 1; Whip-poor-will, 1; Hairy Woodpecker, 1; Tufted Titmouse, 1; Red-breasted Nuthatch, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; House Wren, 0.5; Great Horned Owl, +; Chimney Swift, +; Tree Swallow, +; Barn Swallow, +; Am. Crow, +; Brown Creeper, +; Am. Robin, +; Cedar Waxwing, +; Nashville Warbler, +; N. Cardinal, +; Field Sparrow, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 37 species; 116.5 territories ($208/\text{km}^2$, 84/100 acres). **Remarks:** Nest found: Ruffed Grouse. This census was carried out by 14 people from the Manomet Bird Observatory. Grateful thanks to them and to the Jessie Smith Noyes Foundation for a generous grant which helped to support the work. We are particularly indebted to the Boston Edison Company for permission to census on their land in Plymouth.—TREVOR L. LLOYD-EVANS and R. BRENT BAILEY, Manomet Bird Observatory, Box 936, Manomet, MA 02345.

69. MAPLE-PINE-OAK SECOND-GROWTH FOREST. —
Location: Massachusetts; Norfolk Co., Town of Foxboro conservation land, off Willow and East Streets; $42^\circ 04' \text{N}$, $71^\circ 11' 30'' \text{W}$, Mansfield Quadrangle, USGS. **Continuity:** Established 1976; 7 intermittent years. **Size:** 11.8 ha = 29.2 acres. **Description of Plot:** See AB 31:50-51 (1977). **Weather:** In nearby Boston the temperature for May was 0.3°F below normal, for June 2.7°F above; rainfall in May was 0.58 in. below normal, for June 1.85 in. below. **Coverage:** May 1, 17-18, 25, 28; June 1-2, 5, 9, 14, 18, 30; 0610-1710. Total obs.-hours: 24. **Census:** Veery, 6 (51, 21); Ovenbird, 6; Blue Jay, 5 (42, 17); Gray Catbird, 5; Scarlet Tanager, 4 (34, 14); Rufous-sided Towhee, 4; Black-capped Chickadee, 3 (25, 10); Wood Thrush, 3; Black-and-white Warbler, 3; Com. Yellowthroat, 3; N. Flicker, 2; Tufted Titmouse, 2; N. Cardinal, 2; Downy Woodpecker, 1+; Am. Robin, 1+; N. Oriole, 1+; Ruffed Grouse, 1; Great Crested Flycatcher, 1; White-breasted Nuthatch, 1; Field Sparrow, 1; Broad-winged Hawk, +; E. Wood Pewee, +; Am. Crow, +; Com. Grackle, +. **Total:** 24 species; 55 territorial males or females ($465/\text{km}^2$, 188/100 acres). **Visitors:** Hairy Woodpecker, Barn Swallow, Blue-winged Warbler, Am. Goldfinch. **Remarks:** Nests found: Blue Jay and chickadee 3, flicker, titmouse, nuthatch, Ovenbird, 1 each. March and April were very wet; there was standing water in about 25% of the plot until the middle of June. Brown-headed Cowbird

males were seen and heard singing on 2 occasions, and a female seen on 2 others. The absence of cuckoos correlates with a low density of Gypsy Moths.—WILLIAM E. DAVIS, JR., College of Basic Studies, Boston Univ., Boston MA 02215.

70. 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; $40^\circ 51' 23'' \text{N}$, $72^\circ 39' 46'' \text{W}$, Eastport Quadrangle, USGS. **Continuity:** Established 1977; 7 consecutive years. **Size:** 9.67 ha = 23.9 acres. **Description of Plot:** See AB 33:68 (1979). **Weather:** May was slightly cooler and wetter than normal (mean temperature 54.4°F, 25-year average 55.6°, precipitation 4.22 in. 25-year average 3.83 in.). June had somewhat above normal temperature and average precipitation (66.8° vs 65.4° and 2.63 in. vs 2.72 in.). Weather varied from clear to overcast, temp 26-71° and wind speeds from 0-6.0 m/s but mostly light. **Coverage:** May 2, 10, 25; June 2, 11, 15, 21, 30; 0430-0800 EST. Total obs.-hours: 13.5. **Census:** Rufous-sided Towhee, 17.5 (181, 73); Prairie Warbler, 8.5 (88, 36); Field Sparrow 3 (31, 13); Brown Thrasher, 2.5; N. Mockingbird, 0.5; Com. Yellowthroat, 0.5. **Total:** 6 species; 32.5 territories ($336/\text{km}^2$, 136/100 acres). **Visitors:** Marsh Hawk, Mourning Dove, Yellow-billed Cuckoo, Blue Jay, Am. Crow, Am. Robin, Gray Catbird, Com. Grackle, Brown-headed Cowbird. **Remarks:** The decrease in Prairie Warbler numbers is believed due to a late frost that killed most of the young Scrub Oak leaves thus reducing cover and insect food. Towhees were up in numbers compared to 1982 and appear to have a 2-year cycle. Other changes over the 7-year period are not significant—EDWARD KEMNITZER (compiler) and GILBERT RAYNOR, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934.

71. SECOND-GROWTH OAK-PITCH PINE FOREST. —
Location: New York, Suffolk Co., Upton, near NE corner of Brookhaven National Laboratory property, 6000 ft S of State Rd 25; $40^\circ 53' 16'' \text{N}$, $72^\circ 51' 53'' \text{W}$, Wading River Quadrangle, USGS. **Continuity:** Established 1977; 7 consecutive years. **Size:** 9.3 ha = 22.97 acres. **Description of Plot:** See AB 33:69 (1979). **Weather:** May was slightly cooler and wetter than normal (mean temp. 54.4°F, 25-year average 55.6°F, precipitation 4.22 in., 25-year average 3.83 in.). June had somewhat above normal temperature and average precipitation (66.8°F vs 65.4°F and 2.63 in. vs 2.72 in.). Weather varied from clear to overcast with fog and light showers on single trips, 48-80°F and wind speeds 0-7.0 m/s but mostly light. **Coverage:** April 29; May 8, 14, 18, 21, 24, 26, 28; June 1, 3, 10, 13, 17, 20-21, 27, 30; 0500-1000, EST. Total obs.-hours: 37. **Census:** Rufous-sided Towhee, 17.5 (188, 76); Ovenbird, 8.5 (91, 37); N. Oriole, 7.5 (81, 33); Great Crested Flycatcher, 4 (43, 17); Blue Jay, 4; N. Flicker, 2; Scarlet Tanager, 2; Black-capped Chickadee, 1.5; White-breasted Nuthatch, 1; Hermit Thrush, 1; Brown

Thrasher, 1; Pine Warbler, 1; Blue-winged Warbler, 0.5. **Total:** 13 species; 51.5 territories ($554/\text{km}^2$, 224/100 acres). **Visitors:** Mourning Dove, Whip-poor-will, Hairy Woodpecker, Tufted Titmouse, Veery, Am. Robin, Gray Catbird, Red-eyed Vireo, Black-and-white Warbler, Am. Redstart, Com. Yellowthroat, Rose-breasted Grosbeak, Com. Grackle, Brown-headed Cowbird. **Remarks:** Nests found: Com. Flicker 2, Hermit Thrush 1 with cowbird eggs. Species carrying nest material: Blue Jay, Pine Warbler. Species carrying food for young: Blue Jay, Brown Thrasher, Ovenbird, Scarlet Tanager, N. Oriole. Recently fledged young: Hermit Thrush, Ovenbird, Rufous-sided Towhee. The number of territorial males is the second highest in the 7 years of the census; N. Oriole numbers are the highest ever. The number of species is about average. No noticeable habitat change has occurred on or near the plot.—**KAREN BLUMER, JAMES CLINTON, SR.** (compiler) **RAYMOND KUTZMAN, KATHLEEN TUOHY, and GILBERT RAYNOR, Moriches Bay Audubon Society, Box 802, Center Moriches, NY 11934.**

72. 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, $42^\circ 7' 30''\text{N}$, $77^\circ 45' \text{W}$, Andover Quadrangle, USGS. **Continuity:** Established 1974; 10 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 temp. in May and July (49.9° and 67.2°) were near normal; June (62.0°) was 2° warmer than the 57-year average. Total precipitation in May (3.57 in.) was near normal; June rainfall (4.85 in.) was slightly above average and July rainfall (2.19 in.) was slightly below. **Coverage:** May 11, 20, 29; June 8, 15, 27; July 3, 10, 19, 28; Aug. 6, 15; 0745-2030, EDT. Total obs.-hours: 16. **Census:** Black-throated Green Warbler, 14 (84, 34); Magnolia Warbler, 10 (60, 24); Blackburnian Warbler, 10; Dark-eyed Junco, 6 (36, 15); Black-capped Chickadee, 5 (30, 12); Golden-crowned Kinglet, 5; Blue Jay, 4 (24, 10); Am. Robin, 4; Red-breasted Nuthatch, 3 (18, 7); Ovenbird, 3; House Wren, 2; Wood Thrush, 2; Solitary Vireo, 2; Yellow-rumped Warbler, 2; Com. Yellowthroat, 2; Indigo Bunting, 2; Chipping Sparrow, 2; Brown-headed Cowbird, 2; Broad-winged Hawk, 1; Brown Creeper, 1; Veery, 1; N. Cardinal, 1; Rose-breasted Grosbeak, 1; Song Sparrow, 1; Purple Finch, 1; Barred Owl, +; Downy Woodpecker, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Am. Crow, +; Scarlet Tanager, +. **Total:** 31 species; 87 territorial males ($524/\text{km}^2$, 212/100 acres). **Visitors:** Red-shouldered Hawk, Wild Turkey, Cedar Waxwing, Nashville Warbler, Hooded Warbler, Am. Goldfinch. **Remarks:** Nests found: chickadee, 2; House Wren, 4; robin, 1. The Red Pine section of the plot (11 acres) has been selectively logged, with over 45,000 board feet of lumber harvested, resulting in increased open space between pines, growth



BBC 72, Allegany Co., N.Y. Upland Mixed Pine-Spruce Hardwood Plantation.

of briars and hardwood saplings and increased brush piles. No significant change in species present or total territorial males was noted. Appreciation to Gaylord Rough for weather data and to Martin Eddy of the Eddy Lumber Co. for information about harvested trees.—**ELIZABETH W. BROOKS, 1435 Waterwells Rd., Alfred Station, NY 14803.**

73. CENTRAL HARDWOOD FOREST WITH SCATTERED PINE. — **Location:** Washington, D.C.; Rock Creek Park, lying S of Military Road and W of Rock Creek; $38^\circ 57' 30''\text{N}$, $77^\circ 2' 40''\text{W}$, Washington W Quadrangle, USGS. **Continuity:** Established 1948; 24 intermittent years. **Size:** 26.3 ha = 65 acres. **Description of Plot:** See AFN 2:153-154 (1948). **Weather:** Average temp. 69°F . Rainfall was above normal in April, May, and June but fell to well below normal in July. **Coverage:** April 2, 14, 17, 22, 27, 29; May 5, 15, 19, 22, 26, 30; June 1, 5, 10, 12, 17, 19, 24, 30; July 8; 0450-1830, EST. Total obs.-hours: 37. **Census:** Ovenbird, 9 (34, 14); Carolina Chickadee, 7 (27, 11); Tufted Titmouse, 7; Wood Thrush, 6 (23, 9); Red-eyed Vireo, 6; Scarlet Tanager, 6; Blue Jay, 5.5 (21, 8); Downy Woodpecker, 4.5 (17, 7); E. Wood-Pewee, 4.5; N. Cardinal, 4.5; Red-bellied Woodpecker, 4 (15, 6); N. Flicker, 3.5 (13, 5); Hairy Woodpecker, 2.5; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; European Starling, 2; Rufous-sided Towhee, 2; Pileated Woodpecker, 1; E. Phoebe, 1; Am. Crow, 1; Carolina Wren, 1; Worm-eating Warbler, 1; Louisiana Waterthrush, 1; Mourning Dove, 0.5; Veery, +; Brown-headed Cowbird, +. **Total:** 26 species; 84.5 territories ($321/\text{km}^2$, 130/100 acres). **Visitors:** Mallard, Broad-winged Hawk, Am. Kestrel, Acadian Flycatcher, Am. Robin, Gray Catbird, Brown Thrasher, Kentucky Warbler, Hooded Warbler, Com. Grackle. **Remarks:** The total species was close to the 28 for 1982. Nests located (1 each): Downy Woodpecker, E. Phoebe, Blue Jay, and Starling. The total territories was well above the 67.5 for 1982. Individual increases were in general small and scattered over a variety of species, probably resulting from a more intensive coverage of the area in 1983; a total of 23 trips this year as compared with 16 in 1982. Long-term population trends continued, for example, the low level of neotropical migrants such as the Red-eyed Vireo and Ovenbird.—**JOAN CRISWELL** (compiler) and **ROBERT FORD, 5000 Glover Road NW, Washington, D. C. 20015.**

74. BIRCH-SPRUCE-FIR FOREST.

— **Location:** West Virginia; Randolph Co., 4 mi N-NW of Durbin; the centerline starts at $38^\circ 36' 09''\text{N}$, $79^\circ 51' 11''\text{W}$, Durbin Quadrangle, USGS. **Continuity:** Established 1968; 3 intermittent years. **Size:** 6.07 ha = 15 acres.

Description of Plot: See AB 27:981 (1973) (under Fir-Spruce Swamp). The dominant canopy trees are Red Spruce and Yellow Birch. Most prominent in the understory are Mountain-Laurel and Mountain Maple. The ground cover is primarily sedge and ferns (*Thelypteris* sp.). A quantitative survey of the vegetation (June 1978) gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 339/acre; total basal area 132 ft²/acre. Species comprising 90% of the total number of trees: Red Spruce, 88, 26.1, 23.2, 50; Yellow Birch, 88, 26.1, 20, 83; Sweet Birch, 17, 4.9, 17.3, 50; Balsam Fir, 70, 20.7, 15.8, 100; E. Hemlock, 15, 4.4, 8.7, 67; Red Maple, 13, 3.9, 1.0, 33; serviceberry, 13, 3.9, 1.0, 33; dead trees, 33, 9.8, 12, 83. Trees by diameter size class: A (3-6 in.) 197, 58, 14.9, 14.9; B (6-9 in.) 68, 20, 12.3, 15.5; C (9-15 in.) 47, 14, 22.4, 28.3; D (15-21 in.) 22, 6, 23.4, 29.5; E (21-27 in.) 5, 1, 9.3, 11.7. Shrub stems/acre 2153; ground cover 50%; canopy cover 67%; average canopy height 47 ft (range 38-60). **Edge:** Similar habitat continues in all directions except for an open sedge marsh at one end and a beaver pond adjacent to 1 side for a third of its length. **Topography:** Level bog forest with mucky areas and a small meandering stream. **Elevation:** 3660 ft. **Weather:** Clear, cool. **Coverage:** June 7-13; between dawn and 0730 hours or 1900-2000 hours, EDT. Total party-hours: 15. **Census:** Brown Creeper, 4 (66, 27); Golden-crowned Kinglet, 4; N. Waterthrush, 4; Blackburnian Warbler, 3 (49, 20); Magnolia Warbler, 2.5; Red-breasted Nuthatch, 2; House Wren, 2; Winter Wren, 2; Solitary Vireo, 2; Canada Warbler, 2; Swainson's Thrush, 1; Hermit Thrush, 1; Wood Thrush, 1; Black-throated Blue Warbler, 1; Mourning Warbler, 1; Scarlet Tanager, 1; Dark-eyed Junco, 1; Purple Finch, 1; Ruffed Grouse, +; Black-capped Chickadee, +; Am. Robin, +; Red-eyed Vireo, +; Black-throated Green Warbler, +; Swamp Sparrow, +; Brown-headed Cowbird, +. **Total:** 25 species, 35.5 territorial males ($585/\text{km}^2$, 237/100 acres). **Visitors:** Red-shouldered Hawk, Barred Owl, Blue Jay, N. Raven, Cedar Waxwing. **Remarks:** Nests located (2): Brown Creeper and Scarlet Tanager. Changes in habitat have occurred since the area was first studied in 1968. Up-rooted fallen trees from a storm in 1972 together with construction of a beaver pond adjacent to the plot subsequent to the census conducted in 1973 are the most obvious changes. The pond construction has raised the water table resulting in more dead trees.—**M. BERDINE, K. BUSH, A. EDDY, G. EDDY, J. GRAHAM, M. HOOKER, E. HUTTON, E. REICHELDERFER, D. SELLERS, P. SEIGRIST, B. SMITH** (compiler), **P. TEMPLE and J. WORTHLEY, Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.**



BBC 74, Randolph Co., W.V. Birch-Spruce-Fir Forest. Photo/A. R. Bucklew, Jr.

75. VIRGIN SPRUCE-NORTHERN HARDWOODS FOREST. — Location:

West Virginia; Pocahontas Co., 6 mi N of Durbin; 38°37'44"N, 79°50'35"W, Wildell Quadrangle, USGS, extends S into Durbin Quadrangle. **Continuity:** Established 1947, 1948, then studied at five year intervals; 6 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Part of a 50-acre tract of virgin forest that was left standing when region was timbered. The dominant trees are Red Spruce and Yellow Birch. Most prominent in the understory are Hobblebush and Striped Maple. The ground cover is primarily Corn. Wood Sorrel, ferns, Lycopodium and mosses. A quantitative vegetation survey of six 0.1 acre circular samples gave: Trees 3-in. diameter and over 280/acre; total basal area 246 ft²/acre. Species comprising 90% of the total number of trees: Red Spruce, 83, 30, 40, 100; Yellow Birch, 90, 32, 25, 100; Am. Beech, 40, 14, 10, 83; dead trees, 40, 14, 15, 83. Trees by diameter size class: A (3-6 in.) 122, 43, 12, 5; B (6-9 in.) 47, 17, 14, 6; C (9-15 in.) 48, 17, 39, 16; D (15-21 in.) 32, 11, 57, 23; E (21-27 in.) 22, 8, 67, 27; F (27-33 in.) 7, 2, 33, 13; G (33-40 in.) 2, 1, 12, 5; H (41 in.) 2, 1, 14, 5. Shrub stems/acre 3850; ground cover 51%; canopy cover 70%; average deciduous canopy height 80 ft (range 70-85). The spruce extends 20 ft or more above

the deciduous canopy, average height 101 ft (range 90-117). **Edge:** Forest continues on all sides. **Topography:** Centerline starts at 4050 ft, slopes to 4000 ft within 300 yds, then continues relatively level; E exposure with lateral fall of 20-100 ft across the plot. **Weather:** Clear and cool. **Coverage:** June 5-11; between dawn and 0730 hours, EDT. Total party-hours: 9.5. **Census:** Blackburnian Warbler, 8 (132, 53); Dark-eyed Junco, 5.5 (91, 37); Golden-crowned Kinglet, 5 (82, 33); Black-throated Green Warbler, 5; Black-throated Blue Warbler, 3.5 (58, 23); Brown Creeper, 3 (49, 20); Red-breasted Nuthatch, 1.5; Winter Wren, 1.5; Canada Warbler, 1.5; Black-capped Chickadee, 1; Red-eyed Vireo, 1; Magnolia Warbler, 1; Mourning Warbler, 1; Purple Finch, 1; Chimney Swift, +; Yellow-bellied Sapsucker, +; Downy Woodpecker, +; Swainson's Thrush, +. **Total:** 18 species; 39.5 territorial males (651/km², 263/100 acres). **Visitors:** Blue Jay, Am. Crow, Hermit Thrush, Am. Goldfinch. **Remarks:** There is a slump area approximately 400 yds from the N end where the Canada Warbler and Mourning Warbler were found. With the aging trees, more Brown Creepers are being found than in former years. Creepers were observed at about equal distances on and off the plot boundaries.—H. BALL, K. BUSH, H. CONRAD, A. EDDY (compiler), G. EDDY,

G. E. EDDY, E. E. HUTTON, JR., J. JONES
N. LAITSCH, A. LLEWELLYN, E. RIECHEL
DERFER, R. RICHARDSON, W. SMITH P
TEMPLE and N. VENABLE, Brooks Bird
Club, 707 Warwood Ave., Wheeling, WV
26003.

76. DISTURBED MIXED CONIFEROUS-HARDWOOD FOREST. — Location:

Georgia; Fannin Co., Chattahoochee Forest National Fish Hatchery, 20 mi S of Morganton, Ga., 34°42'19"N, 84°09'03"W, Noontoola 7.5 min Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 9.8 ha = 24.2 acres (a 1 mile transect measured by car odometer from hatchery N to an old cemetery. Width of 200 ft paced 100 ft each side of centerline of dirt road). **Description of Plot** See AB 37:70 (1983). Utility rights-of-way were cleared in late August 1982 by cutting off vegetation to a height of 6 in. By the end of this study the height was 3 ft. **Weather:** Normal. Temp. range in April was 30-70°F; in June it was 50-85°F; 5 inches of rain during June. **Coverage:** April 4, 16, 29; May 3, 11, 22, 28; June 2-5, 7-9, 11-14, 16, 21, 23, 26, 28, 30; 0600-0900, EDT. **Census:** Carolina Chickadee, 5 (51, 21); Red-eyed Vireo, 5 Ovenbird, 5; Song Sparrow, 5; Tufted Titmouse, 4 (41, 17); Yellow-throated Warbler 4; Indigo Bunting, 3 (31, 12); Black-throated Green Warbler, 2.5; E. Phoebe, 2; Gray Catbird, 2; N. Parula, 2; Black-and-white Warbler, 2; Louisiana Waterthrush, 2; Hooded Warbler, 2; Chimney Swift, 1; Belted Kingfisher, 1; Pileated Woodpecker, 1; Acadian Flycatcher, 1; Am. Crow, 1; N. Cardinal 1 Great Horned Owl, 0.5; Blue Jay, 0.5; Scarlet Tanager, 0.5; Ruffed Grouse, +; E. Screech Owl, +; Carolina Wren, +; Yellow-throated Vireo, +; Solitary Vireo, +; Kentucky Warbler, +; Rufous-sided Towhee, +. **Total:** 30 species; 53 territorial males (541/km², 219/100 acres). **Visitors:** Turkey Vulture, Broad winged Hawk, Mourning Dove, Whip-poor-will, Ruby-throated Hummingbird, Downy Woodpecker, N. Flicker, E. Wood-Pewee, Great Crested Flycatcher, N. Rough-winged Swallow, White-breasted Nuthatch, Black-throated Blue Warbler, Worm-eating Warbler, Am. Goldfinch, Red Crossbill. **Remarks:** Nests found (4): E. Phoebe, 2 Carolina Chickadee, 1; and Song Sparrow 1.—JOHN T. FULTON, Yazoo NWR, Rt. 1 Box 286, Hollandale, MS 38748.

77. RED PINE PLANTATION. — Location:

Connecticut; Litchfield Co., White Memorial Foundation, Morris; 41°42'30"N, 73°10'W, Litchfield Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AB 33:72 (1979). **Coverage:** June 6, 10, 14-16; 0700-2100. Total obs.-hours 15. **Census:** Gray Catbird, 19 (224, 90), Com. Yellowthroat, 12 (141, 57); Chestnut-sided Warbler, 10 (118, 48); Rufous-sided Towhee, 7 (82, 33); House Wren, 6.5 (76 31); Veery, 5 (59, 24); Black-and-white Warbler, 5; Am. Redstart, 4.5 (53, 21); Rose breasted Grosbeak, 4.5; Black-capped Chick

adee, 4 (47, 19); Red-eyed Vireo, 4; Blue-winged Warbler, 4; Scarlet Tanager, 4; N. Flicker, 3 (35, 14); Am. Robin, 3; Brown-headed Cowbird, 3; Yellow-bellied Sapsucker, 2.5; Blue Jay, 2; Tufted Titmouse, 2; Wood Thrush, 2; Song Sparrow, 2; Yellow-throated Vireo, 1.5; Ruffed Grouse, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Great Crested Flycatcher, 1; White-breasted Nuthatch, 1; Cedar Waxwing, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Red-tailed Hawk, 0.5; Barred Owl, 0.5; E. Wood-Pewee, 0.5; N. Cardinal, 0.5; N. Oriole, 0.5; Turkey Vulture, +; Broad-winged Hawk, +; Great Horned Owl, +; Pileated Woodpecker, +; Am. Crow, +; Blue-gray Gnatcatcher, +. **Total:** 43 species; 123 territorial males ($1,447/\text{km}^2$, 586/100 acres). **Remarks:** Since the cutting of most of the Red Pine in the winter of 1978-9, groundcover and undergrowth have flourished. The number of species has remained constant since 1981 but the total number of territorial males rose from 93.5 in 1981 and 1982 to a peak of 123. This is the highest concentration of territorial males ever recorded on a non-wetland plot in 17 years of censusing at the White Memorial Foundation. Gray Catbird gained 10 territorial males; Chestnut-sided Warbler, Com. Yellowthroat and Black-and-white Warbler each gained 4. The Yellow-bellied Sapsuckers, Ruby-throated Hummingbird and Cedar Waxwing are new. The Kentucky Warbler of the last 2 years did not return.—*ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.*

78. UPLAND CHRISTMAS TREE FARM. — **Location:** New York; Allegany Co., 1½ mi NE of Elm Valley, off the Jones Road.; $42^\circ 10' \text{N}$, $77^\circ 50' \text{W}$, Andover Quadrangle, USGS. **Continuity:** New. **Size:** 10.72 ha = 26.5 acres (measured with tape and compass). **Description of Plot:** A managed Christmas tree farm divided into 12 subplots. Subplot #1 (1.9 ha) was planted in 1979 with 6000 Blue Spruce; average height is now 1.7 ft. Subplot #2 (1.3 ha) was planted in 1978 with 2063 Austrian Pine; average height is now 2.7 ft. Subplot #3 (1.0 ha) was planted in 1977 with 3000 Scotch Pine; average height is now 4.4 ft. Subplot #4 (0.7 ha) was planted in 1971 with 2000 Douglas-fir; average height now is 6.5 ft. Subplot #5 and subplot #6 (total 1.97 ha) were planted in 1969 with Blue Spruce and Scotch Pine but most of the marketable trees have been harvested and only several dozen scattered trees remain (average height of Scotch Pine is now 10.1 ft and of Blue Spruce, 6.1 ft). Subplot #7 (0.9 ha) was planted in 1977 with 2045 Scotch Pine (average present height is 5.1 ft) and in 1980 with 1535 Blue Spruce between the rows of Scotch Pine (average present height is 1.2 ft). Subplot #8 (0.5 ha) is fallow. Subplot #9 (0.4 ha) was planted in 1970 with 50 Scotch Pine (present height 6.4 ft) and 100 Blue Spruce (present height 5 ft). Subplot #10 (0.5 ha) was planted in 1970 with 500 Blue Spruce and the present average height is 5.8 ft. Subplot #11 (0.77 ha) is fallow. Subplot #12 (0.45 ha) was planted in 1970 with Blue Spruce (average



BBC 78, Allegany Co., N.Y. Upland Christmas Tree Farm.

present height 7 ft) and Scotch Pine (average height 7.25 ft) and in 1972 with Austrian Pine (average height 4.5 ft) for a total of 1500 trees. Several contour ditches and grassy lanes allow access by mowing machines and tractors. A large pile of bulldozed trunk stubs and dead trees, situated on one corner of the plot, serves as a singing perch. Most of the trees in subplot #12 will be harvested this fall. This plot should prove interesting because there should be a continuous cycle of fallow field to newly planted trees to trees ready for harvest. In some subplots, where the lack of shrubby growth permits, when trees reach one-third of their market size, a new crop of 12-16 in. seedlings is planted between rows. When the mature crop is harvested the new trees are then in the 2-4 ft range and are the sole crop on the subplot during their period of maximum growth. **Edge:** Bordered on the W and N by a dirt road and cultivated fields (potato and hay), on the S by mixed shrubs, a Douglas-fir planting and an old apple orchard, and on the E by a narrow hedgerow of mature Sugar Maple and a plantation of Scotch Pine and Fraser Fir. **Topography:** Gently sloping from N to S. **Elevation:** 2170 ft. **Weather:** See Census 72. **Coverage:** May 19, 28; June 7, 14, 24; July 2, 11, 17, 26; Aug. 4, 13, 19; 0815-1620, EDT. Total party-hours: 16. **Census:** Chipping Sparrow, 11 (103, 42); Song Sparrow, 9 (84, 34); Field Sparrow, 5 (47, 19); Am. Robin, 2; Cedar Waxwing, 2; Prairie Warbler, 2; Grasshopper Sparrow, 2; Bobolink, 2; Red-winged Blackbird, 2; Purple Finch, 2; Rufous-sided Towhee, 1; Am. Goldfinch, 1; Black-billed Cuckoo, +; Horned Lark, +; Gray Catbird, +; Brown Thrasher, +; Com. Yellowthroat, +; Vesper Sparrow, +; Savannah Sparrow, +. **Total:** 19 species; 41 territorial males ($382/\text{km}^2$, 155/100 acres). **Visitors:** N. Harrier, Killdeer, Mourning Dove, Barn Swallow, Am. Crow, Black-capped Chickadee, E. Bluebird, Blue-winged Warbler, Chestnut-sided Warbler, Rose-breasted Grosbeak; Com. Grackle; **Remarks:** Nests found (24): Am. Robin, 3; Prairie Warbler, 2; Purple Finch, 2; towhee 1; Chipping Sparrow, 10; Field Sparrow, 3; Song Sparrow, 3. No cowbirds were ever observed. Human activity (mowing between rows and pruning trees) between June 13-20 caused some disturbance to nests. Of the 24 nests found, 14 were in Blue Spruce in the 6-10 ft range and 6 in Douglas-fir in the same height range. Of the marketable-sized trees, Scotch Pine was the least used for nesting. Scotch Pines were sprayed with SEVIN once in May because of sawfly infestation. Appreciation to Tom and Kathy

Kent for information about the plantation and permission to conduct the study on their land; to Gaylord Rough for weather data; to Peter Gradoni and Lois Chapman for assistance on 2 surveys; and to Peter W. Houlihan who did the habitat description and survey as part of an Alfred University independent study project for the Environmental Studies program.—*ELIZABETH W. BROOKS, 1435 Waterwells Rd., Alfred Station, NY 14803.*

79. 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; $42^\circ 7' 30'' \text{N}$, $77^\circ 45' \text{W}$, Andover Quadrangle, USGS. **Continuity:** Established 1969; 15 consecutive years. **Size:** About 9.3 ha = 23 acres. **Description of Plot:** See *AFN* 23:743-744 (1969). **Weather:** See Census 72. **Coverage:** Apr. 10; May 17, 27; June 2, 10, 19, 30; July 6, 14, 22; Aug. 1, 8, 16; Sept. 12; 0830-2030, EDT. Total obs.-hours: 22. **Census:** Chipping Sparrow, 11 (118, 48); Song Sparrow, 10 (107, 43); Com. Yellowthroat, 8 (86, 35); Cedar Waxwing, 5 (54, 22); Field Sparrow, 5; Indigo Bunting, 4 (43, 17); Alder Flycatcher, 3 (32, 13); Am. Robin, 3; Yellow-rumped Warbler, 3; Am. Woodcock, 2; Rufous-sided Towhee, 2; Purple Finch, 2; Mourning Dove, 1; Black-billed Cuckoo, 1; Tree Swallow, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Nashville Warbler, 1; Magnolia Warbler, 1; Prairie Warbler, 1; Brown-headed Cowbird, 1; Am. Goldfinch, 1; Mallard, +; Blue Jay, +; House Wren, +; N. Cardinal, +; Dark-eyed Junco, +. **Total:** 27 species, 68 territorial males ($731/\text{km}^2$, 296/100 acres). **Visitors:** Broad-winged Hawk, Ruffed Grouse, N. Flicker, Am. Crow, Golden-crowned Kinglet, Blue-winged Warbler, Chestnut-sided Warbler, Rose-breasted Grosbeak, White-throated Sparrow, Bobolink. **Remarks:** Nests found (31): Mourning Dove, 1; Black-billed Cuckoo, 1; Tree Swallow, 1; chickadee, 1; robin, 6; Cedar Waxwing, 2; Yellow-rumped Warbler, 2; Com. Yellowthroat, 1; towhee, 2; Chipping Sparrow, 10; Field Sparrow, 1; Song Sparrow, 2; Purple Finch, 1. No nests were parasitized by cowbirds. Declines continue for Song Sparrow, Chipping Sparrow; increases for yellowthroat and Indigo Bunting; junco was a new species. Appreciation to Gaylord Rough for weather data, and to Cynthia Clements and Phillips Foster for permission to conduct this study on their land.—*ELIZABETH W. BROOKS, 1435 Waterwells Rd., Alfred Station, NY 14803.*

80. SPRUCE-PINE FOREST. — **Location:** Pennsylvania, Indiana Co., 1.6 mi ENE of Shelocta; $40^\circ 39' 47'' \text{N}$, $79^\circ 15' 58'' \text{W}$, Elder-ton Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (L-shaped, 1470 × 360 ft. in an E-W direction and 625 × 360 ft. in a N-S direction, measured longitudinally with surveyor's chain and Brunton compass; estimated laterally). **Description of Plot:** The dominant canopy trees are Norway Spruce and Red Pine. Most prominent in the understory are saplings of Norway Spruce, White Oak,

Black Cherry, and Shingle Oak. The ground cover is primarily Hay-scented Fern and Com. Haircup Moss. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 712/acre; total basal area 242.8 ft²/acre. Species comprising 94% of the total number of trees: Norway Spruce, 457, 64, 47, 67; Red Pine, 165, 23, 42, 67; E. White Pine, 52, 7, 8, 50. Trees by diameter size class: A (3-6 in.), 295, 41, 30, 12; B (6-9 in.), 253, 36, 76, 31; C (9-15 in.), 157, 22, 125, 52; D (15-21 in.), 7, 1, 12, 5. Shrub stems/acre 1,242; ground cover 20%; canopy cover 76%; average canopy height 48 ft (range 43-51). **Edge:** Bordered on 3 sides by similar coniferous forest. Forest continues to the E but is basically deciduous. **Topography:** 5° S facing slope. **Elevation:** 1090-1140 ft. **Weather:** Temp. range, 33-67°F, averaged 52°. It was clear on 4 trips, partly cloudy on 8, and cloudy on 12. **Coverage:** May 20, 22-27, 29-31, June 1; between 0523-2057 hours, EDT. Total party-hours: 9.2. **Census:** Black-throated Green Warbler, 11 (181, 73); Wood Thrush, 3 (49, 20); Ovenbird, 2; N. Cardinal, 2; Rufous-sided Towhee, 2; Black-capped Chickadee, 1; Golden-crowned Kinglet, 1; Am. Robin, 1; Gray Catbird, 1; Turkey Vulture, +; Broad-winged Hawk, +; Chimney Swift, +; Barn Swallow, +; Blue Jay, +; Am. Crow, +; Solitary Vireo, +; Scarlet Tanager, +; Brown-headed Cowbird, +. **Total:** 18 species, 24 territorial males (395/km², 160/100 acres). **Visitors:** Cedar Waxwing, Com. Yellowthroat, Indigo Bunting, Chipping Sparrow, Red-winged Blackbird, Com. Grackle, Am. Goldfinch. **Remarks:** Thanks to Jerry Pickering for identifying the moss and Glen Phillips for his invaluable advice and assistance.—ROGER V. and MARGARETA HIGBEE, R. D. 2, Box 166, Indiana, PA 15701.

81. YOUNG SPRUCE FOREST.—**Location:** West Virginia; Pocahontas and Randolph Co.; 5 mi N of Durbin; 38°37'05"N, 79°50'44"W Durbin quadrangle, USGS. **Continuity:** Established 1947; 8 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Previously described as Young Spruce Forest, see AB 27:981 (1973). The dominant canopy trees are Red Spruce. Most prominent in the understory are Mountain Laurel and Rosebay Rhododendron. The ground cover is primarily mosses and the liverwort *Bazzania trilobata*. A quantitative survey of the vegetation, made in 1978, gave the following results: Trees 3-in. and over, based on six 0.1 acre circular samples, 1090/acre; total basal area 185 ft²/acre. Species comprising 99.6% of the total number of trees: Red Spruce 1000, 92, 94, 100; dead trees 87, 8, 6, 100. Trees by diameter size class: A (3-6 in.) 484, 74, 81, 44; B (6-9 in.) 147, 22, 74, 40; C (9-15 in.) 23, 4, 30, 16. Shrub stems/acre 1358; ground cover 74%; canopy cover 80%; average canopy height 41 ft (range 34-50). **Edge:** A continuous uniform habitat except for an access road thru the center, parallel to the long dimension and extending about ½ the length on the N end. **Topography:** A nearly flat mountain top. **Elevation:** 4445 ft. **Weath-**

er: Clear and cool. **Coverage:** June 5-10, between dawn and 0725 hours or 1900-2020 hours, EDT. Total party-hours: 8.8. **Census:** Golden-crowned Kinglet, 5 (82, 33); Dark-eyed Junco, 5; Magnolia Warbler, 2.5; Yellow-rumped Warbler, 2.5; Am. Robin, 1.5; Winter Wren, 0.5; Solitary Vireo, 0.5; Black-throated Green Warbler, 0.5; Black-capped Chickadee, +; Hermit Thrush, +; Swainson's Thrush, +. **Total:** 11 species; 18 territorial males (297/km², 120/100 acres). **Visitors:** Purple Finch, Am. Goldfinch. **Remarks:** Probably one of the more significant developments affecting this plot is the presence of Yellow-rumped Warblers. The first Foray census to confirm their presence was made in 1978. Although not published in *American Birds*, 2 were found on this mountain top. At least 3 males were singing this year. Although our plot boundaries did not include all the territory of 1 of the singing males, pair bond behavior was observed. Repeated efforts to find a nest of this unusual species have failed, but the presence in 1982 of this species on a study plot AB 37:76 (1983) on a nearby knob leads one to surmise that the vegetation has grown so like the habitat of their choice farther north that the species is occupying a more southern niche. One cannot ignore the possibility that they are returning to an ancestral home occupied before the timber was removed.—GLEN PHILLIPS (compiler), [and members of the] Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003.

82. 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; 16 consecutive years. **Size:** 14.16 ha = 35 acres. **Description of Plot:** See AFN 22:714-715 (1968). **Coverage:** May 23; June 1, 14; 900-1200, EDT. Total obs.-hours: 6. **Census:** Ovenbird, 3 (21, 9); House Wren, 2; Chimney Swift, 1; N. Flicker, 1; E. Wood-Pewee, 1; E. Phoebe, 1; Blue Jay, 1; Tufted Titmouse, 1; Wood Thrush, 1; Veery, 1; Am. Robin, 1; Gray Catbird, 1; Eur. Starling, 1; Red-eyed Vireo, 1; Blue-winged Warbler, 1; Black-and-white Warbler, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Mourning Dove, +; Black-capped Chickadee, +; White-breasted Nuthatch, +; N. Cardinal, +. **Total:** 23 species, 22 territorial males. (155/km², 63/100 acres). **Visitors:** Am. Crow, N. Oriole, Kentucky Warbler. **Remarks:** The total number of species and territorial males were down 5 and 6 respectively. This marks a continual decline in the total number of species and territorial males for the third consecutive year. One ♂ Kentucky Warbler was heard and observed for 4 consecutive days during the first week of June and then disappeared.—LEON L. BARKMAN, Western Conn. Bird Club, 26 West St., Newtown, CT 06470.

83. OAK-HEMLOCK FOREST, TRANSITION FOREST AND THICKET.—**Location:** Connecticut; New London Co., New London; Bolleswood Natural Area, Connecti-

cut Arboretum, Conn College, S of Galloway Lane, 41°22'N, 72°7'W, Uncasville Quadrangle, USGS. **Continuity:** Established 1955 (1953); 13 intermittent years. **Size:** Oak-hemlock forest: 23.1 ha = 57 acres; transition forest and thicket: 6.5 ha = 16.1 acres. **Description of Plot:** See AB 37:73-74 (1983). **Weather:** Cool and rainy in May, warm and dry in June, with early morning temperatures of 65-70°F. **Coverage:** April 30; May 10, 14, 18, 21, 25; June 1, 8, 13, 15, 22, 29; July 6, 0500-0800, EST. Total obs.-hours: 62.5. **Census:** Oak-hemlock forest: Ovenbird, 15 (65, 26); Red-eyed Vireo, 13 (56, 23); Black-capped Chickadee, 11.5 (50, 20); Veery, 11.5; Rufous-sided Towhee, 10 (43, 18); Gray Catbird, 9.5 (41, 17); Black-and-white Warbler, 9.5; Tufted Titmouse, 8 (35, 14); House Wren, 7 (30, 12); Wood Thrush, 6.5 (28, 11); Scarlet Tanager, 6.5; Great Crested Flycatcher, 4 (17, 7); Blue Jay, 4; N. Cardinal, 4; Com. Yellowthroat, 3.5 (15, 6); Downy Woodpecker, 2.5; Blue-winged Warbler, 2.5; Brown-headed Cowbird, 2.5; Hairy Woodpecker, 2; White-breasted Nuthatch, 2; Louisiana Waterthrush, 2; Red-winged Blackbird, 2; Chestnut-sided Warbler, 1.5; Hooded Warbler, 1.5; Broad-winged Hawk, 1; Barred Owl, 1; N. Flicker, 1; E. Wood-Pewee, 1; Worm-eating Warbler, 1; Am. Redstart, 1; Song Sparrow, 1; N. Oriole, 1; Yellow-billed Cuckoo, 0.5; Red-bellied Woodpecker, +; E. Kingbird, +; E. Phoebe, +; Am. Robin, +; House Finch, +. **Total:** 38 species; 150.5 territorial males (652/km², 264/100 acres).

Visitors: Am. Crow, Black-throated Green Warbler, Canada Warbler, Com. Grackle, Rose-breasted Grosbeak. **Census:** Transition forest and thicket: Red-eyed Vireo, 5 (77, 31); Chestnut-sided Warbler, 4.5 (69, 28); House Wren, 4 (61, 25); Blue-winged Warbler, 3.5 (54, 22); Rufous-sided Towhee, 3.5; Com. Yellowthroat, 3 (46, 19); Gray Catbird, 2.5; Black-capped Chickadee, 2; Tufted Titmouse, 2; White-eyed Vireo, 2; N. Cardinal, 2; Yellow-billed Cuckoo, 1.5; Veery, 1.5; Ovenbird, 1.5; Blue Jay, 1; Carolina Wren, 1; Veery, 1; Am. Redstart, 1; N. Flicker, 0.5; Hooded Warbler, 0.5; Scarlet Tanager, 0.5; White-breasted Nuthatch, +; Am. Robin, +; N. Oriole, +. **Total:** 24 species; 44 territorial males (675/km², 273/100 acres). **Visitors:** E. Phoebe, Am. Crow, Yellow Warbler, Rose-breasted Grosbeak, Com. Grackle. **Remarks:** Oak-hemlock forest: Between 1953 and 1976, 7 species of birds characteristic of mature forest disappeared or declined markedly in this part of the plot even though intensive vegetation surveys indicate that the forest remained relatively unchanged. In 1982, 2 of these species (E. Wood-Pewee and Red-eyed Vireo) were again present in good numbers, and 2 other forest species (Worm-eating Warbler and Acadian Flycatcher) had territories for the first time. In 1983 this trend toward recovery appeared to continue. Eastern Wood-Pewee was again present, albeit at a lower density than in 1982. Red-eyed Vireo, which had gone from a high of 22 males in 1955 to a low of 4 in 1976, increased from 10 males in 1982 to 13 in 1983. Worm-eating Warbler was still present, but Acadian Flycatcher did not return. In addition, some other forest species

(Black-and-white Warbler, Hooded Warbler, and Ovenbird) have increased since 1976. Ovenbird density increased from 5 males in 1976 to 15 in 1983. Transition forest and thicket: The bird community of this former old field has remained relatively unchanged since 1973. Several species that declined between 1953 and 1973 (White-eyed Vireo, Chestnut-sided Warbler, and Rufous-sided Towhee) have maintained low, relatively constant densities since then. Also, several species that first appeared in the early 1970's (Black-capped Chickadee, Veery, Wood Thrush, Am. Redstart, and Scarlet Tanager) have maintained relatively constant densities since that time. Red-eyed Vireo is an exception, having increased from 1 male in 1973 to 5 males in 1983. We thank the Connecticut Arboretum for financial support for this census.—ROBERT A. ASKINS and MARGARET J. PHILBRICK, Dept. of Zoology, Conn. College, New London, CT 06320.

84. UPLAND BRUSHY PASTURE.—

Location: Connecticut; Litchfield Co., White Memorial Foundation, Litchfield, 41°42'N, 73°13'28"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 17 intermittent years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AFN 19:609-610 (1965). **Coverage:** June 7, 9-10, 12, 17; 0700-2100. Total obs -hours: 16. **Census:** Gray Catbird, 18 (212, 86); Com. Yellowthroat, 11 (129, 52); Black-and-white Warbler, 6.5 (76, 31); Wood Thrush, 6 (71, 29); Rose-breasted Grosbeak, 6; Rufous-sided Towhee, 6; Red-eyed Vireo, 5.5 (65, 26); Black-capped Chickadee, 5 (59, 24); Veery, 5; Cedar Waxwing, 4 (47, 19); Blue-winged Warbler, 4; Nashville Warbler, 4; Am. Redstart, 3.5 (41, 17); Ruffed Grouse, 3 (35, 14); Tufted Titmouse, 3; Chestnut-sided Warbler, 3; N. Cardinal, 3; Am. Goldfinch, 3; E. Screech Owl, 2; N. Flicker, 2; Blue Jay, 2; Ovenbird, 2; Brown-headed Cowbird, 2; Field Sparrow, 2; Song Sparrow, 1.5; Am. Woodcock, 1; Black-billed Cuckoo, 1; Great Crested Flycatcher, 1; Am. Robin, 1; Brown Thrasher, 1; E. Phoebe, 0.5; Am. Crow, 0.5; House Wren, 0.5; N. Oriole, 0.5; Purple Finch, 0.5; Broad-winged Hawk, +; Barred Owl, +; Blue-gray Gnatcatcher, +; Scarlet Tanager, +. **Total:** 39 species; 120.5 territorial males (1,418/km², 574,100 acres).

Remarks: Succession from grazed pasture to hardwood forest continues unabated. The number of territorial males increased to a new high for this area. Notable 1 year rises were Black-and-white Warbler, 3.5 to 6.5; Wood Thrush and Rose-breasted Grosbeak, 2 to 6; Black-capped Chickadee, 2 to 5; and Tufted Titmouse, 0.5 to 3. The most notable decline was Blue-winged Warbler, 8 to 4. The E. Screech Owl which first appeared in 1981 but was missed last year reappeared; 2 pairs responded to the playing of tapes.—ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.

85. MOIST DECIDUOUS FOREST-LAKE ONTARIO WETLAND.—

Location: New York; Oswego Co., 4 mi W of SUNY Oswego campus on Lake Ontario

shore, 43°26'N, 76°35'W, Oswego West Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 16.2 ha = 40 acres. **Description of Plot:** See AB 37:74-75 (1983). **Weather:** Ave. temp. 70°, with ave. rainfall for the period. **Coverage:** June 10-14, 21, 24-25; 0700-0900 and 2000-2200 hrs. Total obs.-hours: 8. **Census:** Yellow Warbler, 22 (136, 55); Song Sparrow, 17 (105, 43); Am. Robin, 10 (62, 25); Am. Redstart, 10; Com. Yellowthroat, 7 (43, 18); Red-winged Blackbird, 7; House Wren, 6 (37, 15); Gray Catbird, 6; Green-backed Heron, 5 (31, 13); Mourning Dove, 4 (25, 10); E. Wood-Pewee, 4; Veery, 4; Com. Grackle, 4; N. Cardinal, 4; Wood Thrush, 3 (19, 8); N. Oriole, 3; Am. Goldfinch, 3; N. Flicker, 2; Willow Flycatcher, 2; Cedar Waxwing, 2; Eur. Starling, 2; Warbling Vireo, 2; Swamp Sparrow, 2; Mallard, 1; Blue-winged Teal, 1; Wood Duck, 1; Sora, 1; Ruby-throated Hummingbird, 1; Least Flycatcher, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Tree Swallow, 1; Blue Jay, 1; Black-capped Chickadee, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Red-eyed Vireo, 1; Brown-headed Cowbird, 1; House Finch, 1. **Total:** 39 species; 147 territorial males (908/km², 368/100 acres). **Visitors:** Great Blue Heron, Black-crowned Night-Heron, Belted Kingfisher, Red-bellied Woodpecker, Downy Woodpecker.—GEORGE R. MAXWELL, Dept. of Zoology, Rice Creek Biological Field Station, State Univ. College, Oswego, NY 13126.

86. DECIDUOUS FOREST WITH POND AND BROOK.—

Location: New Jersey; Bergen Co.; Mahwah; Campgaw Mountain Reservation. **Continuity:** Established 1964; 20 consecutive years. **Size:** Approximately 16.2 ha = 40 acres. **Description of Plot:** See AFN 19: 623-624 (1965). **Coverage:** May 17, 19, 24, 26, 31; June 2, 7, 9, 14; 0530-0630. Total party-hours: 9. **Census:** Veery, 4 (25, 10); Tree Swallow, 3 (19, 8); Tufted Titmouse, 3; Gray Catbird, 3; European Starling, 3; Ovenbird, 3; Yellow-billed Cuckoo, 2; N. Flicker, 2; E. Wood-Pewee, 2; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Red-eyed Vireo, 2; Com. Yellowthroat, 2; N. Oriole, 2; Song Sparrow, 2; Spotted Sandpiper, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Am. Robin, 1; Blue-gray Gnatcatcher, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; House Finch, 1. **Total:** 30 species; 52 territorial males (321/km², 130/100 acres).—J. and N. BRISTOW, I. FRANTZ, D. MILLER, K. SJOLANDER, T. SUDNIK, J. WHITE, J. WORRALL and J. BROTHERTON (compiler), Fyke Nature Assoc., 249 E. Crescent Ave., Mahwah, NJ 07430.

87. MIXED LOWLAND FOREST AND MEADOW WITH STREAM.—

Location: Pennsylvania: Erie Co., begins 0.3 mi S of Borough of Edinboro on W side of State Highway 99; extends S through Big Conneautee Creek Valley; 41°51'30"N, 80°07'30"W,

Cambridge Springs Quadrangle, USGS. **Continuity:** Established 1981, 3 consecutive years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 37:75 (1983). **Weather:** Average temp. in May was normal and, in June, +2.4°F above normal. Precipitation was slightly above normal during both months (+0.63 in. and +0.12 in., respectively). **Coverage:** May 12, 21, 27; June 1-3, 6-7, 9-10, 15; July 16; 0600-0930 and 1500-2000 Total obs.-hours: 18. **Census:** Am. Robin, 12 (148, 60); Song Sparrow, 10 (124, 50); European Starling, 8.5 (105, 43); Yellow Warbler, 5.5 (68, 28); Gray Catbird, 5 (62, 25); Com. Grackle, 4 (49, 20); Brown-headed Cowbird, 3 (37, 15); House Wren, 2.5; Com. Yellowthroat, 2.5; Am. Goldfinch, 2.5; Downy Woodpecker, 2; Willow Flycatcher, 2; Cedar Waxwing, 2; Red-eyed Vireo, 2; N. Cardinal, 2; Chipping Sparrow, 2; Rough-winged Swallow, 1.5; Red-winged Blackbird, 1.5; House Finch, 1.5; Mallard, 1; Mourning Dove, 1; N. Flicker, 1; Adler Flycatcher, 1; Least Flycatcher, 1; E. Wood-Pewee, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Warbling Vireo, 1; N. Oriole, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Ruby-throated Hummingbird, 0.5; Belted Kingfisher, 0.5; Hairy Woodpecker, 0.5; E. Phoebe, 0.5; Barn Swallow, 0.5; Field Sparrow, 0.5; House Sparrow, 0.5; Great Blue Heron, +; Green Heron, +; Chimney Swift, +. **Total:** 42 species; 88.5 territorial males (1093/km², 443/100 acres). **Visitors:** Spotted Sandpiper, Black-billed Cuckoo, Great Horned Owl, E. Kingbird, Am. Crow, Wood Thrush, Blue-gray Gnatcatcher, Blue-winged Warbler, Cerulean Warbler, Scarlet Tanager, Rufous-sided Towhee. **Remarks:** Two of 5 large dead trees were cut during the past year, eliminating the nest sites of Am. Kestrel and Red-headed Woodpecker, and cattle heavily grazed the pasture, preventing Bobolink nesting this year. Nevertheless, the number of territorial species and males has remained remarkably constant during the 3 years (42 to 45 and 88.5 to 94, respectively). Alder Flycatcher and House Finch were new territorial species. Very cool temperatures during the first 3 weeks of May slowed development of green undergrowth and, presumably, was the explanation for the nesting delay of an average of 10 days beyond normal. A total of 32 nests of 13 species were noted. Species recorded as visitors were present during one or several June and/or July trips.—DONALD B. SNYDER, Dept. of Biology and Health Services, Edinboro Univ. of Pa., Edinboro, PA 16444.

88. OLD FIELD — MEADOW AND PRIMARY DECIDUOUS THICKETS.—

Location: Pennsylvania; Butler Co., Buffalo Township, 1 mi S of intersection of State Rte 228 and Kepple Rd.; 40°44'N, 79°42'W, Freeport Quadrangle, USGS. **Continuity:** Established 1974; 8 intermittent years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AB 28:1027-1028 (1974). **Weather:** Temp range, 42°-65°F during census. Late frost in May, June average rainfall and temperature, July regularly dry, August moist. **Coverage:**

May 28, June 1 3 5, 7, 10 12 15 19 23, July 3; 0500-0700, and intermittent observations throughout the day. Total obs.-hours: 16. **Census:** Field Sparrow, 5 (49, 20); Blue-winged Warbler, 4 (40, 16); Com. Yellowthroat, 4; Indigo Bunting, 4; Rufous-sided Towhee, 4; Red-eyed Vireo, 2.5; Gray Catbird, 2; Song Sparrow, 2; Black-capped Chickadee, 1.5; Scarlet Tanager, 1.5; Tufted Titmouse, 1; Acadian Flycatcher, 0.5; Wood Thrush, 0.5; Kentucky Warbler, 0.5; Ruffed Grouse, +; Hairy Woodpecker, +; Blue Jay, +; Am. Crow, +; Great Crested Flycatcher, +; Ovenbird, +; Hooded Warbler, +. **Total:** 21 species; 33 territorial males ($326/\text{km}^2$, 132/100 acres). **Visitors:** Great Blue Heron, Green-backed Heron, Mallard, Turkey Vulture, Red-tailed Hawk, Broad-winged Hawk, Killdeer, Solitary Sandpiper, Spotted Sandpiper, Mourning Dove, Yellow-billed Cuckoo, E. Screech-Owl, Great Horned Owl, Chimney Swift, Downy Woodpecker, Pileated Woodpecker, Ruby-throated Hummingbird, E. Wood-Pewee, Tree Swallow, N. Rough-winged Swallow, Barn Swallow, House Wren, Am. Robin, Blue-gray Gnatcatcher, Cedar Waxwing, Golden-winged Warbler, N. Parula, Magnolia Warbler, Black-throated Green Warbler, Chestnut-sided Warbler, Bay-breasted Warbler, Prairie Warbler, Canada Warbler, Yellow-breasted Chat, Red-winged Blackbird, Com. Grackle, N. Oriole, Am. Goldfinch. **Remarks:** Nests found: Wood Thrush, 1; Scarlet Tanager, 1; Song Sparrow, 1. Density of territorial males has dropped more than 30% since last year. Most likely due to ever encroaching deciduous trees and thickets on the meadow proper. Very cold weather in May may have effected warbler populations. This census was made possible by a grant from the Audubon Society of Western Pennsylvania.—**MIKE STARKER**, 136 N. Main St., West Hartford, CT 06107.

89. ABANDONED PASTURE SCRUB-LAND. **Location:** Ontario, Ottawa, Innis Point, $45^\circ 20' \text{N}$, $75^\circ 54' \text{W}$. **Continuity:** Established 1982; 2 consecutive years. **Size:** 90 ha = 22.24 acres. **Description of Plot:** See AB 37:76-77 (1983). **Weather:** All but 1 day were clear and relatively calm, some days humid and hazy, temp. 60–82°F. **Coverage:** June 15, 17, 21, 24, 30; July 5, 8, 12; 0445-0930 hours. Total obs.-hours: 23. **Census:** Yellow Warbler, 7 (78, 32); Song Sparrow, 6 (67, 27); White-throated Sparrow, 5.5 (61, 25); Com. Yellowthroat, 3 (33, 13); N. Oriole, 3; Great Crested Flycatcher, 2.5; Blue Jay, 2; Black-capped Chickadee, 2; Am. Robin, 2; Black-and-white Warbler, 2; Indigo Bunting, 1.5; Black-billed Cuckoo, 1; N. Flicker, 1; E. Wood-Pewee, 1; Gray Catbird, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Rose-breasted Grosbeak, 1; Brown-headed Cowbird, 1; Mourning Dove, 0.5; Brown Thrasher, 0.5; Ruffed Grouse, +; Spotted Sandpiper, +; Hairy Woodpecker, +; E. Kingbird, +; Am. Crow, +; White-breasted Nuthatch, +; Veery, +; Nashville Warbler, +; Scarlet Tanager, +; Red-winged Blackbird, +; Am. Goldfinch, +. **Total:** 32 species; 45.5 territorial males ($506/\text{km}^2$, 205/100



BBC 89, Innis Point, Ottawa, Ontario. Abandoned-Pasture Scrubland. Photo/J. Dean.

acres). **Visitors:** Black Duck, Am. Kestrel, Killdeer, Com. Snipe, Downy Woodpecker, Pileated Woodpecker, Tree Swallow, Red-breasted Nuthatch, European Starling, Am. Redstart, Field Sparrow, Com. Grackle. **Remarks:** Nests found: Spotted Sandpiper, Black-billed Cuckoo, N. Flicker, Yellow Warbler, White-throated Sparrow; Ruffed Grouse with young. Several new territorial species were found: Black-billed Cuckoo, N. Flicker, E. Wood-Pewee, Red-eyed Vireo, Com. Yellowthroat, Indigo Bunting. Species recorded last year but not this year: Am. Woodcock and Whip-poor-will.—**JOANNE DEAN**, Ottawa Banding Group, 73 Irving Place, Ottawa, Ontario K1Y 2A2.

90. TRANSITIONAL MIXED FOREST-FIELD. — **Location:** Ontario, Simcoe Co., Tay Township, Wye Marsh, 4 km SE of Midland; $44^\circ 44' \text{N}$, $79^\circ 51' \text{W}$; Map: Orr Lake 31D/12; Grid Reference: 533917. **Continuity:** Established 1979; 4 intermittent years. **Size:** 6.0 ha = 14.8 acres. **Description of Plot:** See AB 34:65-66 (1980). **Weather:** The last week of May and first week of June were generally overcast, rainy and cool. During the rest of the period there were clear skies and warm temperatures. Temp. range, 9–24°C. **Coverage:** May 25; June 2, 10, 15, 22, 24, 28; July 13; 0600-0845, EST. Total obs.-hours: 57.75. **Census:** Yellow Warbler, 7.5 (125, 51); Am. Redstart, 7.5; Great Crested Flycatcher, 6 (100, 41); Song Sparrow, 5 (83, 34); Am. Robin, 5; Veery, 4 (67, 27); Gray Catbird, 4; Rose-breasted Grosbeak, 4; Cedar Waxwing, 3 (50, 20); Am. Goldfinch, 3; Black-capped Chickadee, 2.5; E. Kingbird, 2; Tree Swallow, 2; House Wren, 2; Brown Thrasher, 2; Red-winged Blackbird, 2; N. Oriole, 2; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Com. Yellowthroat, 1. **Total:**

20 species; 66.5 territorial males ($1110/\text{km}^2$, 449/100 acres). **Visitors:** Ruffed Grouse, Com. Snipe, Mourning Dove, Ruby-throated Hummingbird, Downy Woodpecker, Hairy Woodpecker, N. Flicker, Pileated Woodpecker, E. Wood-Pewee, E. Phoebe, Barn Swallow, Blue Jay, Am. Crow, White-breasted Nuthatch, European Starling, Philadelphia Vireo, Ovenbird, Chipping Sparrow, Bobolink, E. Meadowlark, Com. Grackle, Brown-headed Cowbird. **Remarks:** Ten Nests located (10): Rose-breasted Grosbeak (3); Tree Swallow (2); Am. Robin (2); Yellow Warbler (1); Great Crested Flycatcher (1); Brown Thrasher (1). The following populations showed significant changes since 1982: Red-winged Blackbird (715 to 2), Cedar Waxwing (10.5 to 3), Gray Catbird (9.5 to 4), Song Sparrow (10.5 to 5), Black-capped Chickadee (12 to 2.5), Am. Redstart (13.5 to 7.5), Am. Robin (9 to 5). There was a 60% decrease (112 to 67) in total density of territorial males over 1981; New territorial species recorded over 1982 were: Am. Goldfinch, Tree Swallow, House Wren, Red-eyed Vireo. Species not on territory this year yet recorded on territory in 1982 were: N. Flicker, Blue Jay, Bobolink, Nashville Warbler, Mourning Dove. New visitor species recorded over 1982 were: Downy Woodpecker, Ovenbird, Chipping Sparrow, Philadelphia Vireo. Special thanks to Ian Attridge, Eva Kaiser and Robert Whittam for their assistance with the census trips.—**KATHRYN M. MILLS**, Wye Marsh Wildlife Interpretation Centre, P.O. Box 100, Midland, Ontario, Canada, L4R 4K6.

91. DISTURBED OAK-HICKORY, PINE STAND, EDGE, AND POND. — **Location:** Ohio; Licking Co., Eden Twp., Camp Falling Rock, 1.2 mi NNE of the intersection of Co. Rd. 210 and St. Rt. 79; $40^\circ 11' \text{N}$,

82°18'5" W, Newark Quadrangle, USGS
Continuity: Established 1937; 45 intermittent years
Size: About 14.16 ha = 35 acres.
Description of Plot: See *Bird-Lore* 39:379-80 (1937). Habitat changes: Pine stand was thinned of about 12 mostly dead trees, 4-6 in. dbh. No effect on the present density could be identified. Other changes were those that normally take place within a forest. **Weather:** Despite the variable patterns from late Feb. to early June, the prolonged wet period of late May into June supplied the only measurable effect upon the avian residents. Many nests suffered rain damage, pairs were delayed in nest building or, in a few cases, nests were abandoned. **Coverage:** May 12; June 4, 24; Aug. 28. **Total:** 25 obs.-hours. **Census:** Red-eyed Vireo, 8 (56, 23); Acadian Flycatcher, 7 (49, 20); Am. Robin, 7; Wood Thrush, 5 (35, 14); Scarlet Tanager, 5; E. Wood-Pewee, 3 (21, 9); House Wren, 3; Gray Catbird, 3; Cerulean Warbler, 3; N. Cardinal, 3; Red-bellied Woodpecker, 2; Downy Woodpecker 2; E. Phoebe, 2; Great Crested Flycatcher, 2; Tufted Titmouse, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Kentucky Warbler, 2; Chipping Sparrow, 2; Ruffed Grouse, 1; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; N. Flicker, 1; Pileated Woodpecker, 1; Blue Jay, 1; Am. Crow, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1; Warbling Vireo, 1; Louisiana Waterthrush, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Song Sparrow, 1; Brown-headed Cowbird, 1; N. Oriole, 1. **Total:** 38 species, 84 pairs ($593/\text{km}^2$, 240/100 acres). **Remarks:** No cowbird eggs or young observed. Am. Redstart and Hooded Warbler males summered; 18 nests were found.—A. H. CLAUGUS, 228 S. Lake St., Carey, OH 43316

92. 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; 9 consecutive years. **Size:** 20.23 ha = 50 acres. **Description of Plot:** See AB 29: 1117-8 (1975). **Coverage:** May 18, 21, 24, 27-28; June 3, 6, 12, 18, 26; 0545-1000, EDT. Total obs.-hours: 10. **Census:** Rufous-sided Towhee, 24 (119, 48); Hooded Warbler, 22.5 (111, 45); Red-eyed Vireo, 7 (35, 14); White-eyed Vireo, 6 (30, 12); Ruby-throated Hummingbird, 5 (25, 10); Yellow-breasted Chat, 5; N. Cardinal, 4 (20, 8); Indigo Bunting, 3 (15, 6); Kentucky Warbler, 2; Ruffed Grouse, 1; Black-billed Cuckoo, 1; Yellow-billed Cuckoo, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Wood Thrush, 1; N. Parula, 1; Black-throated Green Warbler, 1; Brown-headed Cowbird, 1; Worm-eating Warbler, 0.5; Whip-poor-will, +; Pileated Woodpecker, +; Black-and-white Warbler, +; Scarlet Tanager, +. **Total:** 25 species; 90 territorial males or females ($445/\text{km}^2$, 180/100 acres). **Remarks:** New breeding species: Ruffed Grouse, Black-billed Cuckoo, Tufted Titmouse. The chat population seems to have

peaked (16 in 1980) and is headed back down. The Hooded Warbler population continues to increase. Although the densities of different species continue to go up and down, the overall density has been rather stable for the last 4 years (90.5-1980, 91-1981, 90-1982, 90-1983). The cool, wet spring seemed to have inhibited much early nesting activity. The peak of activity was about 2 weeks later than normal.—RICHARD LEWIS, Rt. 3, Box 470, Bristol, TN 37620.

93. 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; 7 consecutive years. **Size:** 27.0 ha = 66.7 acres. **Description of Plot:** See AB 32:80 (1978) and 33:79 (1979). Changes: Only about 1½ acres near the house were mowed at all this season. Most of the cornfield and vegetable garden remained fallow. Other changes minor. **Weather:** Cold, including some snow Apr. 18 and freezes Apr. 19-20, injured some flowers and foliage, but damage seemed less than in 1982. May very wet, creek running often; June damp; July and August hot and dry. Temp. 32°-75° F. **Coverage:** Mar. 6; Apr. 10, 27-28; May 1-2, 5-7, 11, 13-14, 18, 31; June 20, 23; mostly 0500-0700, CDT, some until 1430. Total obs.-hours: over 38. **Census:** Red-eyed Vireo, 16 (59, 24); Field Sparrow, 9 (33, 13); Prairie Warbler, 7 (26, 10); N. Cardinal, 7; Indigo Bunting, 7; White-eyed Vireo, 5.5 (20, 8); Blue-gray Gnatcatcher, 5 (19, 7); Carolina Chickadee, 4 (15, 6); Tufted Titmouse, 3.5 (13, 5); Yellow-breasted Chat, 3.5; Rufous-sided Towhee, 3 (11, 4); Black-and-white Warbler, 2.5; Ovenbird, 2; Com. Yellowthroat, 2; Yellow-billed Cuckoo, 1.5; Whip-poor-will, 1.5; Ruby-throated Hummingbird, 1.5; Acadian Flycatcher, 1.5; Broad-winged Hawk, 1; Am. Woodcock, 1; Mourning Dove, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; E. Bluebird, 1; Wood Thrush, 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1; Hooded Warbler, 1; Chipping Sparrow, 1; Brown-headed Cowbird, 1; Am. Goldfinch, 1; Pileated Woodpecker, 0.5; Brown Thrasher, 0.5; Summer Tanager, 0.5; Scarlet Tanager, 0.5; E. Screech-Owl, +; E. Wood-Pewee, +. **Total:** 41 species; 102 territorial males or females ($378/\text{km}^2$, 153/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Chimney Swift, Barn Swallow, Blue Jay, Am. Crow, Song Sparrow. **Remarks:** Nests found: E. Phoebe 2, gnatcatcher 2. The slow decrease of most of the migratory species, especially the woodland dwellers, continues; the resident species are holding their numbers or are increasing. The severe April weather must have adversely affected the earlier arriving migratory species. Transients were relatively numerous this season, with some (Swainson's Thrush and Rose-breasted Grosbeak) still present the last 2 days in May.—RICHARD

W SIMMERS, JR., Box 170, Route 6, Cookeville, TN 38501.

94. SUBURBAN CEMETERY. — **Location:** Alabama, Jefferson Co., Birmingham, Oakland Cemetery, immediately NE of intersection of Pike and Warrior Rds in Ensley section; 33°29'N, 86°54'W, Bessemer Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 15 ha = 37 acres. **Description of Plot:** See AB 34:18-19 (1980). **Weather:** Winter and spring were under the influence of wet Pacific rather than cold Canadian air masses. Heavy rains falling on already saturated ground brought flooding conditions for weeks on end. A very wet April, May, and June brought the annual precipitation to 43.45 ins. in 6 months or 80.8% of the 53.75 in. normal 12-month rainfall. July was hot and dry with only 1.53 ins. (normal 4.17). On March 10 an all-day wet snow falling onto warm ground against a green background of half-leaved oaks, Sweetgum, elm, hackberry, etc. was a very unusual sight. Then on March 24, 3 ins. of snow was the third and largest measurable snowfall in March in more than 40 years. The last frost was on April 20, a month later than usual, and 48° was recorded on June 2 and 8. Then came hot, humid, and hazy July. **Coverage:** March 1 to July 31; 0730-1940, 143 trips in 152-day period, 97 obs.-hours (40-minute almost daily coverage throughout the year). **Census:** Starling, 13 (87, 35); Am. Robin, 12 (80, 32); House Sparrow, 12; N. Mockingbird, 9 (60, 24); Blue Jay, 8 (53, 22); N. Cardinal, 8; Mourning Dove, 5 (33, 14); Rufous-sided Towhee, 5; Com. Grackle, 4 (27, 11); Brown Thrasher, 3 (20, 8); Brown-headed Cowbird, 3; Rock Dove, 2; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Carolina Wren, 1; Wood Thrush, 1; N. Parula, 1; Red-winged Blackbird, 1; House Finch, 1; Chimney Swift, +; E. Meadowlark, +. **Total:** 25 species; 95 territorial males ($634/\text{km}^2$, 257/100 acres). **Visitors:** (possible breeders only); Ruby-throated Hummingbird, Red-headed Woodpecker, E. Wood-Pewee, White-breasted Nuthatch, Gray Catbird. **Remarks:** Of the 22 confirmed breeders, only Great Crested Flycatcher and Wood Thrush are not permanent resident. Of the 8 probable and possible breeders only Red-headed Woodpecker, White-breasted Nuthatch, and E. Meadowlark are permanent residents. It appears that being permanent resident is a distinct advantage in getting and keeping an adequate breeding territory. The probable and possible breeders apparently had large territories, perhaps because suburbs are marginal habitat for them. Thus they occurred infrequently on the tract and breeding evidence was difficult or impossible to obtain. During the census period, besides the 30 species listed above, there occurred 18 winter residents (22 of the 30 also wintered) plus 52 migrants including even Cattle Egret (6 on April 30) and Forster's (?) Tern (2 on May 31). Such traffic makes birding interesting, but it also makes it difficult to evaluate the ability of any area,

especially southern, to support birds.—
THOMAS A. IMHOF, 1036 Pike Rd., Birmingham, AL 35218.

95. RESTORED TALL GRASS PRAIRIE. — **Location:** Illinois; McLean Co., 6 mi S Gridley; T25N, R2E, SE ¼, NW ¼, Sec 5; 40°40'N, 88°54'W, Normal Quadrangle, USGS. **Continuity:** Established 1976; 8 consecutive years. **Size:** 12.1 ha = 30 acres. **Description of Plot:** See *AB* 31:88-89 (1977). The site originally was described as forage grass meadow; its gradual conversion to native prairie was described in 1982. **Coverage:** June 4, 11-12, 19, 27-28; July 2, 31. Total obs.-hours: 9. **Census:** Red-winged Blackbird, 22 (181, 73); Sedge Wren, 14 (115, 47); Ring-necked Pheasant, 2; Dickcissel, 2; E. Meadowlark, 2; Willow Flycatcher, 1; Yellow Warbler, 1; Com. Yellowthroat, 1; E. Kingbird, +; Barn Swallow, +; E. Bluebird, +; Brown Thrasher, +; Warbling Vireo, +; Indigo Bunting, +; Com. Grackle, +; Am. Goldfinch, +. **Total:** 16 species; 45 territorial males ($371/\text{km}^2$, 150/100 acres). **Remarks:** A total of 24 female Red-winged Blackbirds as recorded. The above birds arrived gradually in mid-July, the 14 being recorded on July 31. The composition of the avifauna was similar to last year except for an increase in the number of Red-winged Blackbirds (14 to 22 males) and a decrease in the number of Dickcissels (4 to 2). The two Dickcissels, however, appeared only irregularly; no nesting occurred.—*DALE E. BIRKENHOLZ, Dept. of Biological Sciences, Ill. State Univ., Normal, IL 61761.*



BBC 95, McLean Co., Il. Restored Tall Grass Prairie. Photo/D. Birkenholz.

BREEDING BIRD POPULATIONS OF PRAIRIE HABITATS IN NORTHWESTERN IOWA

The following 3 censuses were made with the assistance of students in Field Ornithology at Iowa Lakeside Laboratory. All sites are under management to maintain or restore tall grass prairie vegetation.

Weather conditions were recorded at the Iowa Lakeside Laboratory campus. For June, mean high temp. was 24° C, mean low 14°; total precipitation 20.8 cm. This year's cool spring delayed plant growth as well as the timing of migration and nesting of many bird species.

Class members were Rebecca L. Brown, David K. Cole, Karen L. Folkers, Kathy S. Johnson, and Paul D. Vrotsos. Also helping

were D. Mark Maffett and G. Gordon Brown, Jr.—*PETER E. LOWTHER, Dept. Biol., Univ. Northern Iowa, Cedar Falls, IA 50614.*

96. TALL GRASS PRAIRIE I. — **Location:** Iowa; Dickinson Co., Iowa Lakeside Laboratory. NE quarter of NW quarter sec. 23, T99N R37W; 43°23'N, 95°11'W, Okoboji Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 16 ha = 39.54 acres. **Description of Plot:** See *AB* 37:79 (1983). **Coverage:** June 13-14, 16; 0600-0700 or 1900-2030. Total obs.-hours: 14. **Census:** Yellow Warbler, 9 (56, 23); Red-winged Blackbird, 9; Com. Yellowthroat, 5 (31, 13); Brown-headed Cowbird, 4 (25, 10); Am. Goldfinch, 4; Willow Flycatcher, 3 (19, 8); Gray Catbird, 3; Dickcissel, 3; Grasshopper Sparrow, 3; Song Sparrow, 3; Mourning Dove, 2; Ring-necked Pheasant, 1; House Wren, 1; Bobolink, 1. **Total:** 14 species; 51 territorial males ($319/\text{km}^2$, 129/100 acres). **Visitors:** Tree Swallow, Barn Swallow, Cedar Waxwing, Com. Grackle. **Remarks:** Nests found: 1 Ring-necked Pheasant, 1 Willow Flycatcher, 7 Red-winged Blackbird; 5 cowbird eggs in 4 nests (3 Red-winged Blackbird and 1 flycatcher), also Song Sparrow pair feeding 2 young cowbirds.

97. TALL GRASS PRAIRIE II. — **Location:** Iowa; Dickinson Co., Cayler Prairie. NW quarter sec. 17, T99N, R37W; 43°24'N, 95°15'W, Okoboji Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 64.75 ha = 160 acres. **Description of Plot:** See *AB* 37:79 (1983). **Coverage:** June 13, 15, 22; 0615-1130. Total obs.-hours: 56. **Census:** Red-winged Blackbird, 21 (32, 13); Grasshopper Sparrow, 19 (29, 12); Com. Yellowthroat, 16 (25, 10); Dickcissel, 12 (19, 8); W. Meadowlark, 11 (17, 7); Brown-headed Cowbird, 6 (9, 4); Am. Goldfinch, 5 (8, 3); Song Sparrow, 3 (5, 2); Swamp Sparrow, 3; Bobolink, 2; Blue-winged Teal, 1; Ring-necked Pheasant, 1; Upland Sandpiper, 1; Mourning Dove, 1; Am. Robin, 1; Savannah Sparrow, 1. **Total:** 16 species; 104 territorial males ($161/\text{km}^2$, 65/100 acres). **Visitors:** Am. Kestrel, Killdeer, Barn Swallow. **Remarks:** Nests found: 1 Blue-winged Teal, 1 Ring-necked Pheasant, 1 Am. Robin, 1 Grasshopper Sparrow, 1 W. Meadowlark, 21 Red-winged Blackbird; 8 cowbird eggs were found among 7 Red-winged Blackbird nests. Thanks to Dean M. Roosa, Iowa State Preserves Advisory Board, for permission to census this area.

98. TALL GRASS PRAIRIE III. — **Location:** Iowa; Dickinson Co., Freda Haffner Kettlehole Preserve. E half of SW quarter and SE quarter of NW quarter sec. 33, T99N, R37W; 43°20'N, 95°13'W. Milford quadrangle, USGS. **Continuity:** Established 1982. **Size:** 44.77 ha = 110.63 acres. **Description of Plot:** See *AB* 37:79 (1983). **Coverage:** June 10, 14, 17; 0620-1120. Total obs.-hours: 34. **Census:** Com. Yellowthroat, 23 (51, 21); Dickcissel, 18 (40, 16); Red-winged Blackbird, 17 (38, 15); Bobolink, 15 (34, 14); Sedge Wren, 6 (13, 5); W. Meadowlark, 6; Yellow-headed Blackbird, 6; Brown-headed

Cowbird, 6; Am. Goldfinch, 5 (11, 5); Grasshopper Sparrow, 4 (9, 4); Mourning Dove, 2; E. Kingbird, 2; Song Sparrow, 2; Blue-winged Teal, 1; Ring-necked Pheasant, 1; Willow Flycatcher, 1; Gray Catbird, 1; Yellow Warbler, 1; Swamp Sparrow, 1; Com. Grackle, 1. **Total:** 20 species; 119 territorial males ($266/\text{km}^2$, 108/100 acres). **Visitors:** Red-tailed Hawk, Com. Snipe, Black-billed Cuckoo, Chimney Swift, Barn Swallow. **Remarks:** Nests found: 1 Blue-winged Teal, 2 Mourning Dove, 2 E. Kingbird, 1 Gray Catbird, 1 Yellow Warbler, 2 Com. Yellowthroat, 2 Dickcissel, 1 Grasshopper Sparrow, 3 Bobolink, 28 Red-winged Blackbird, 2 Yellow-headed Blackbird, 1 Com. Grackle; 41 cowbird eggs were found among 16 nests (1 E. Kingbird, 1 Yellow Warbler, 2 yellowthroat, 2 Dickcissel, 1 Grasshopper Sparrow, 1 Bobolink, 8 Red-winged Blackbird). Thanks to David Ewert, Iowa Field Office, The Nature Conservancy, for permission to conduct our census on this property.

99. KENTUCKY BLUE GRASS PRAIRIE. — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 13, T142N, R68W, 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 4.84 ha = 12 acres. **Description of Plot:** See *AB* 26:972 (1972). In a retired pasture, this plot has been burned 3 times, most recently in June 1982. Vegetation was quite lush and thick in 1983, in response to favorable late fall 1982 precipitation. Both seasonally flooded wetlands held water throughout June. **Weather:** Precipitation during the preceding fall was adequate to restore most wetlands on the Woodworth Station to average conditions. Precipitation during spring was normal; totals for May and June were 2.2 and 3.5 in., respectively. Average high temp. in May were typical, averaging 66°F, and lows averaged 40°. June temp. were slightly above normal; the mean high was 81°, the mean low 58°. **Coverage:** June 1, 3, 9, 11, 16; 0640-1030, CDT. Total obs.-hours: 2.8. **Census:** Bobolink, 5 (103, 42); Red-winged Blackbird, 3 (62, 25); Blue-winged Teal, 2; N. Shoveler, 1.5; N. Harrier, 1; Sora, 0.5; Le Conte's Sparrow, 0.5; W. Meadowlark, 0.5; Brown-headed Cowbird (♀), 0.5; Gadwall, +; Com. Snipe, +. **Total:** 11 species; 14.5 territorial males ($300/\text{km}^2$, 121/100 acres). **Visitors:** Am. Bittern, Mallard, Green-winged Teal, Lesser Scaup, Marbled Godwit, Black Tern. **Remarks:** Nests found: Blue-winged Teal, N. Harrier.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

100. MIXED PRAIRIE I. — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 11, T142N, R68W; 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 10 ha = 24.7 acres. **Description of Plot:** See *AB* 26:972 (1972). This plot lies in a control

area that has been idle for 17 years. All wetlands on the plot held water throughout June. **Weather:** See Census 99. **Coverage:** June 3, 9, 11-12, 16-17; 0600-0945, CDT. Total obs.-hours: 6.3. **Census:** Clay-colored Sparrow, 8 (80, 32); Red-winged Blackbird, 4.5 (45, 18); Com. Yellowthroat, 3.5 (35, 14); Willow Flycatcher, 3 (30, 12); Yellow Warbler, 2; Grasshopper Sparrow, 2; Bobolink, 1.5, N. Pintail, 1; Wilson's Phalarope, 1; W. Meadowlark, 1; Mallard, 0.5; Blue-winged Teal, 0.5; E. Kingbird, 0.5; Brown Thrasher, 0.5, Savannah Sparrow, 0.5; Com. Grackle, +, Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 18 species; 30 territorial males ($300/\text{km}^2$, 121/100 acres). **Visitors:** Green-winged Teal, N. Shoveler, Gadwall, Lesser Scaup, N. Harrier, Com. Snipe, Killdeer, Upland Sandpiper, Sharp-tailed Grouse, Mourning Dove, Gray Catbird. **Remarks:** Nests found: N. Pintail.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

101. MIXED PRAIRIE II. — **Location:** North Dakota, Stutsman Co., SW quarter of Sect. 1; T142N, R68W; 47°8'N, 99°15'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 32:81-82 (1978). This plot was burned in fall 1971, spring 1976 and spring 1979. All wetlands held water in 1983. **Weather:** See Census 99. **Coverage:** June 2, 9, 11, 16; 0550-0940, CDT. Total obs.-hours: 3.3. **Census:** Red-winged Blackbird, 5.5 (90, 37); Bobolink, 2; Blue-winged Teal, 1.5; Upland Sandpiper, 1; Com. Snipe, 1; E. Kingbird, 1; Com. Yellowthroat, 1; Am. Coot, 0.5; N. Shoveler, +; W. Meadowlark, +; Brown-headed Cowbird, +. **Total:** 11 species; 13.5 territorial males ($221/\text{km}^2$, 90/100 acres). **Visitors:** Mallard, Gadwall, Lesser Scaup, Com. Grackle, Clay-colored Sparrow, Song Sparrow. **Remarks:** Nests found: Upland Sandpiper.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

102. MIXED PRAIRIE III. — **Location:** North Dakota; Stutsman Co.; NW quarter of SW quarter of Sect. 6, T14N, R67W; 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 33:80 (1979). The S 3.3 ha (8.15 acres) portion was burned on August 26, 1981. The remainder was burned on June 10, 1982. **Weather:** See Census 99. **Coverage:** June 1, 3, 9, 11-12; 0550-1055, CDT. Total obs.-hours: 3.5. **Census:** Upland Sandpiper, 1; Com. Yellowthroat, 1; Grasshopper Sparrow, 1; Bobolink, 1, W. Meadowlark, 1; Brown-headed Cowbird (♀), 1. **Total:** 6 species; 6 territorial males or females ($98/\text{km}^2$, 40/100 acres). **Visitors:** Am. Bittern, Marbled Godwit, E. Kingbird, Savannah Sparrow. Chestnut-collared Longspur, Red-winged Blackbird.—

CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.

103. MIXED PRAIRIE IV. — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 11, T142N, R68W; 47°8'N, 99°15'W, Woodworth Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:973-974 (1972). The plot was last burned in fall 1982. All wetlands held water throughout June. **Weather:** See Census 99. **Coverage:** June 2-3, 9, 11, 16-17; 0630-1035, CDT. Total obs.-hours: 3. **Census:** Red-winged Blackbird, 2.5; Upland Sandpiper, 1; Com. Snipe, 1; Com. Yellowthroat, 1; Vesper Sparrow, 1; Brown-headed Cowbird (♀), 1; Horned Lark, +; W. Meadowlark, +. **Total:** 8 species; 7.5 territorial males or females ($123/\text{km}^2$, 50/100 acres). **Visitors:** Mallard, Lesser Scaup, Marbled Godwit, Chestnut-collared Longspur, Yellow-headed Blackbird.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

104. MIXED PRAIRIE V. — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 12, T142N, R68W; 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 12 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 32:82 (1978). This plot has been burned 7 times since 1969, most recently on September 1, 1981. **Weather:** See Census 99. **Coverage:** June 1, 3, 9, 11-12, 16-17; 0515-1100, CDT. Total obs.-hours: 3.7. **Census:** Grasshopper Sparrow, 4 (66, 27); Bobolink, 2.5; Gadwall, 2; W. Meadowlark, 1; Brown-headed Cowbird (♀), 1; Brown Thrasher, 0.5; Upland Sandpiper, +; E. Kingbird, +; Clay-colored Sparrow, +. **Total:** 9 species; 11 territorial males or females ($180/\text{km}^2$, 73/100 acres). **Visitors:** Mallard, Willet, Le Conte's Sparrow, Chestnut-collared Longspur. **Remarks:** Nests found: Gadwall (2).—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

105. MIXED PRAIRIE VIII. — **Location:** North Dakota; Stutsman Co., NW quarter of Sect. 1, T142N, R68W; 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1973; 8 intermittent years. **Size:** 8.7 ha = 21.5 acres. **Description of Plot:** See AB 32:82 (1978). All but the SW 1.5 ha of the plot was burned on September 18, 1981; the remainder was burned June 10, 1982. Seven seasonally flooded wetlands partially or entirely on the plot held water throughout June. **Weather:** See Census 99. **Coverage:** June 1-3, 12, 16; 0520-1130, CDT. Total obs.-hours: 4.1. **Census:** Com. Yellowthroat, 3 (34, 14); Bobolink, 3; Red-winged Blackbird, 2.5; Savannah Sparrow, 1; Grasshopper Sparrow, 1; Sora, 0.5; W. Meadowlark, 0.5; Mallard, +; Brown-headed Cowbird (♀), +. **Total:** 9 species; 11 territorial males or females ($132/\text{km}^2$, 53/100 acres). **Visitors:** Blue-winged Teal, Gadwall, Song Sparrow.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

owlark, 0.5; Mallard, +; Brown-headed Cowbird (♀), +. **Total:** 9 species; 11.5 territorial males or females ($132/\text{km}^2$, 53/100 acres). **Visitors:** Blue-winged Teal, Gadwall, Song Sparrow.—*CRAIG A. FAANES and DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, U.S. Fish and Wildlife Service, Jamestown, ND 58401.*

106. FLOODPLAIN TALL GRASS PRAIRIE. — **Location:** Kansas; Douglas Co., a portion of Baker Wetlands Research Area (Baker Univ., Baldwin City). It occupies much of the NW ¼, SW ¼, Section 18, T-13N, R-20E; 33°55'N, 95°14'W, Lawrence East Quadrangle, USGS. **Continuity:** Established 1974; 10 consecutive years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AB 28:1031-1032 (1974). **Weather:** Average high temp. for May (73.3°F) and June (84°) were slightly below normal and for the first 2 weeks of July (90°) near normal. Average lows for these 3 months were slightly below normal. Precipitation for May (5.82 in.) was more than normal (4.23 in.) but June (3.86 in.) was much drier than normal (6.04 in.) and July (0.23 in.) was drought-like (4.68 in. in the norm). **Coverage:** May 26; June 3, 10, 15, 24; July 1, 6, 13; 0630-0950 and 1850-2050, CDT. Total obs.-hours: 38. **Census:** Dickcissel, 12 (119, 48); Red-winged Blackbird, 6 (59, 24); E. Meadowlark, 4 (40, 16); Com. Yellowthroat, 2; Ring-necked Pheasant, 1; Sedge Wren, 1. **Total:** 6 species; 26 territorial males ($257/\text{km}^2$, 104/100 acres). **Remarks:** Visitors and aerial foragers included: Green-backed Heron, N. Bobwhite, Killdeer, Mourning Dove, Yellow-billed Cuckoo, Chimney Swift, Purple Martin, Barn Swallow, Com. Grackle. Nests found: 4 Red-winged Blackbird, 6 Dickcissel. Common Yellowthroats declined from 7 to 2 pairs this year. Sedge Wrens were not seen in May and June counts but were strongly territorial in July. The area was burned later than usual this year (April 21) and vegetation regrowth was slow. Coupled with a colder spring than usual this seemed to delay onset of breeding in many species. Our thanks to Roger Boyd and his Wetland Ecology class for putting up the grid markers this year after the burn.—*CALVIN L. CINK, MARTIN C. BRAUN and MARK K. SMITH, Biology Dept., Baker Univ., Baldwin City, KS 66006.*

107. SHORTGRASS PRAIRIE. — **Location:** Kansas, Morton Co.; 8N, 3½ W of Elkhart, North ½ of NW ¼ Sec. 2, T33S, R42W; 37°07'30"N, 101°58'W, Elkhart N Quadrangle, USGS. **Continuity:** New. **Size:** 15 ha = 37.05 acres (3×5 ha, determined by 24, 1 square meter samples). **Description of Plot:** The most abundant grass was *Buchloe dactyloides*, (55.5%). Other major grasses were: *Artistida longiseta* (10.5%), *Hordeum pusilla* (2.8%), *H. jubatum* (2%). Forbs were dominated by the stickseeds *Lappula redowskii* and *L. texana* (8.2%). Other major forbs were: *Cryptantha crassisepala* (4.3%), *Sphaeralcea coccinea* (3.2%), *Hymenoxys odorata* (2.4%), *Descurainia pinnata* (1.3%),

Linum pratense (1.3%). *Allium drummondii* (1.1%). There was 15% bare ground. **Edge:** Bordered on all sides by similar habitat. **Topography:** Mostly flat, 3600 ft. **Weather:** Temperature was below average, rainfall above, and wind was about average. **Coverage:** May 29; June 6, 11, 19, 25; July 3; 0715-1450. Total obs.-hours: 7.66. **Census:** Horned Lark, 9 (60, 24); Lark Bunting, 4.5 (30, 12); Grasshopper Sparrow, 4 (27, 11); Burrowing Owl, 2; W. Meadowlark, 2. **Total:** 5 species; 21.5 territorial males (143/km², 58/100 acres). **Visitors:** Mourning Dove, W. Kingbird, Red-winged Blackbird. **Remarks:** No nests were found on this grid.—TIMOTHY C. WAGNER, Dept. of Biol. Sci., Fort Hays State Univ. Hays, KS 67601.

108. BROME SEEDED DIKES-SEWAGE LAGOONS II. — **Location:** Kansas; Lyon Co., Iowa Beef Processors stabilization ponds adjoining the SW edge of Emporia; 18, T-19-S, R-11-E, 38°24'N, 96°14'W, Emporia Quadrangle, USGS. **Continuity:** New. **Size:** 50.6 ha = 125 acres (measured with a planimeter from an aerial photograph). **Description of Plot:** There are 4 ponds totaling 90 surface acres of water. The dikes were built in 1978 and 1979 and seeded to Smooth Brome (*Bromus inermis*). An elongated north pond is separated by the other 3 by a huge interstate power line. Some of this ground is very wet and marshy through July. Plant samples yielded 49% Smooth Brome and 5% other grasses including *Hordeum* sp., *Festuca* sp., *Setaria* sp., and *Elymus* sp. Plants other than grasses listed in order of frequency included spike-rush, sedge, Broad-leaved Cat-tail, Com. Sunflower, Curled Dock, Yellow Sweet Clover, Wild Pepper-grass, and Com. Cocklebur. **Edge:** Bounded on the W and E by farmland, on the N by a sanitary landfill, and on the S by a paved road and an oxbow of the Cottonwood River. **Topography:** Basically flat except for the dikes which are about 45° in slope. **Elevation:** 1150 ft. **Weather:** See Census 200. **Coverage:** May 31; June 8, 20; July 13. Total obs.-hours: 6. **Census:** Red-winged Blackbird, 13 (26, 10); Killdeer, 6 (12, 5); Mallard, 5 (10, 4); Blue-winged Teal, 3 (6, 2); Dickcissel, 2; Brown-headed Cowbird, 1.5; Mourning Dove, 1; E. Meadowlark, +. **Total:** 8 species; 32 territorial males or females (63/km², 26/100 acres). **Remarks:** Nests found: Red-winged Blackbird, 3; Mallard, 4 broods; Blue-winged Teal, 1 brood. Other birds that summered included a single Canada Goose, Black Terns, and a Wilson's Phalarope. **Visitors:** Great Blue Heron, Red-tailed Hawk, Turkey Vulture, Chimney Swift, N. Flicker, E. Kingbird, Purple Martin, Barn Swallow, Am. Crow, and Com. Yellowthroat. Weedy vegetation was not nearly as high on this plot as it was on census 200.—LAWRENCE HERBERT, R2 Box 126, Olpe, KS 66865.

109. 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; 5 consecutive

years. **Size:** 9.11 ha = 22.5 acres. **Description of Plot:** See AB 34:70-71 (1980). **Weather:** Rainfall adequate in April-May, very dry in June-July; temp. below normal, April-June. **Coverage:** May 14, 26; June 3, 11, 25; July 2; 0420-0930. Total obs.-hours: 27. **Census:** Field Sparrow, 7 (77, 31); N. Cardinal, 6 (66, 27); Chipping Sparrow, 5.5 (60, 24); Great Crested Flycatcher, 5 (55, 22); Yellow-billed Cuckoo, 4 (44, 18); Tufted Titmouse, 4; Red-eyed Vireo, 4; Indigo Bunting, 4; Brown-headed Cowbird, 4; Summer Tanager, 2.5; Red-bellied Woodpecker, 2; E. Wood-Pewee, 2; Carolina Chickadee, 2; Blue-gray Gnatcatcher, 2; E. Bluebird, 2; Black-and-white Warbler, 2; Blue Grosbeak, 2; Downy Woodpecker, 1.5; N. Bobwhite, 1; Killdeer, 1; E. Kingbird, 1; Scissor-tailed Flycatcher, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Lark Sparrow, 1; E. Meadowlark, 1; Mourning Dove, 0.5. **Total:** 27 species; 70 territorial males (769/km², 311/100 acres). **Visitors:** Ruby-throated Hummingbird, N. Mockingbird, Yellow-throated Warbler, Prairie Warbler, Am. Goldfinch. **Remarks:** Brush in most of the pasture was mowed in the winter of 1982-83. The population of Indigo Buntings has decreased significantly.—FREDERICK M. BAUMGARTNER, and DALE E. GAWLIK, Little Lewis Whirlwind Nature School and Sanctuary, Rte. 2, Jay, OK 74346.

110. OAK-PINE RAVINE FOREST WITH CLEARINGS. — **Location:** Oklahoma; Delaware Co., 4 mi S of Jay; 36°22'N, 94°48'W, Lake Eucha East Quadrangle, USGS. **Continuity:** Established 1979; 5 consecutive years. **Size:** 7.4 ha = 18.3 acres. **Description of Plot:** See AB 34:71 (1980). **Weather:** See Census 109. **Coverage:** May 12, 29; June 7, 13, 26; July 4; 0425-0805. Total obs.-hours: 28. **Census:** Tufted Titmouse, 6 (81, 33); N. Cardinal, 6; Blue-gray Gnatcatcher, 4.5 (61, 25); Carolina Chickadee, 4 (54, 22); Kentucky Warbler, 4; Indigo Bunting, 4; Yellow-billed Cuckoo, 3.5 (47, 19); Acadian Flycatcher, 3 (41, 16); Red-eyed Vireo, 2.5; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Blue Jay, 2; Louisiana Waterthrush, 2; Brown-headed Cowbird, 2; Black-and-white Warbler, 1.5; Chuck-will's-widow, 1; Whip-poor-will, 1; Am. Crow, 1; White-breasted Nuthatch, 1; White-eyed Vireo, 1; Summer Tanager, 1. **Total:** 22 species; 57 territorial males (770/km², 311/100 acres). **Visitors:** Ruby-throated Hummingbird. **Remarks:** Acadian Flycatchers and Louisiana Waterthrushes were not known to nest on the area in previous years.—FREDERICK M. BAUMGARTNER, and DALE E. GAWLIK, Little Lewis Whirlwind Nature School and Sanctuary, Rte. 2, Jay OK 74346.

111. FLOODPLAIN COTTONWOOD FOREST. — **Location:** Colorado; Jefferson Co., about 10 mi SW of Denver; NE/4 Sec. 14, T6S, R69W, 6th PM; 39°32'N, 105°5'W, Littleton Quadrangle, USGS. **Continuity:** Established 1971; 12 intermittent years. **Size:** 9.7 ha = 24 acres. **Description of Plot:** See AB 25:66 (1971); see also AB 37:84 (1983) for

present plot description. **Weather:** A series of spring snow and rain storms brought unusually heavy precipitation, heavy runoff and snow melt, and caused the reservoir to rise 15 ft above the normal level; it stayed 10-15 ft above normal May 15-July 5. This, of course, also occurred on the trees in the plot. **Coverage:** Mar. 12; Apr. 16; May 7, 24; June 1, 15, July 12. Total obs.-hours: 10. **Census:** Great Blue Heron, 128 (1318, 533); Double-crested Cormorant, 116 (1194, 483); Com. Grackle, 8 (82, 33); Tree Swallow, 6 (62, 25); Eur. Starling, 5 (51, 21); E. Kingbird, 1. **Total:** 6 species; 264 occupied nests or territorial males (2718/km², 1100/100 acres). Excluding the colonial nesting herons and cormorants, 20 occupied nests or territorial males (206/km², 83/100 acres). **Remarks:** None of the species nesting in the plot exclusively, if at all, feeds within the plot (except possibly the kingbirds). For the first of the 13 study years, Great Horned Owls did not nest in the plot. Otherwise the species composition remained as last year's. The herons increased by 15% over last year; they had only 9 nests in 1971. The cormorants increased 75% from the 66 nests of last year; they first nested in the grove in 1979. The grackles continue to build their nests in the understory of the heron nests, where they gain shelter and the herons cannot reach them. Thanks to Brad Buckner, Assistant Manager of Chatfield State Park, and to Sandy Westin, Park Ranger, for their cooperation.—HUGH E. KINGERY, 869 Milwaukee St., Denver, CO 80206.

112. MAPLE-BOXELDER CREEK-BOTTOM. — **Location:** Utah; Salt Lake Co., 2.5 mi NE of Fort Douglas, Salt Lake City; 40°48'N, 111°17'W, Fort Douglas Quadrangle, USGS. **Continuity:** Established 1981; 3 consecutive years. **Size:** 10.8 ha = 26.8 acres (adjusted 1983). **Description of Plot:** See AB 36:86-87 (1982). **Weather:** Colder and wetter than a normal spring, vegetation emerged 2-3 weeks later than usual. Snow runoff from higher elevations produced highest Red Butte Creek flood levels ever recorded. **Coverage:** Apr. 23; May 10, 29; June 8, 18, 25; July 16; 0530-1215 hours. Total obs.-hours: 55. **Census:** Warbling Vireo, 28 (258, 104); Swainson's Thrush, 7 (65, 26); Song Sparrow, 7; Yellow Warbler, 6 (55, 22); MacGillivray's Warbler, 5 (46, 19); Am. Robin, 4 (37, 15); Broad-tailed Hummingbird, 3 (28, 11); Lazuli Bunting, 3; Black-capped Chickadee, 2; Black-headed Grosbeak, 2; Great Horned Owl, 1; **Total:** 11 species; 68 territorial males (627/km², 254/100 acres). **Visitors:** Cooper's Hawk, Black-chinned Hummingbird, Downy Woodpecker, N. Flicker, Dusky Flycatcher, Scrub Jay, Am. Dipper, Orange-crowned Warbler, W. Tanager, Rufous-sided Towhee, Am. Goldfinch. **Remarks:** Nests located (9): Broad-tailed Hummingbird, Black-capped Chickadee, Am. Robin (2), Swainson's Thrush, Warbling Vireo (2), Yellow Warbler, Lazuli Bunting.—JOSHUA BURNS, BILL HUNTER, VAUGHN LOVEJOY and MARK LEPPERT, Utah Audubon Society, P.O. Box 9419, Salt Lake City, UT 84109.

113. ASPEN FOREST. — **Location:** Manitoba; Cornwallis Municipality; near Brandon, 3.2 km E of Hwy #10 along the NW boundary of the Brandon Hills Wildlife Area, 50 m S of the parking lot; Sect. 6, T. 9, Rge. 18W, 49°44'N, 99°55'W, Wawanesa, 62G/12. **Continuity:** Established 1982. **Size:** 16 ha = 39.54 acres. **Description of Plot:** See AB 37:99 (1983). **Weather:** Clear and relatively calm with 1 overcast morning. Temperatures ranged from +3-+19°C. **Coverage:** May 28, 31; June 5, 7, 14, 17, 21, 25, 28, 0530-0900 hrs, CDT. Total obs.-hours: 19. **Census:** Least Flycatcher, 16.5 (103, 42); Am. Redstart, 5.5 (34, 14); Veery, 3 (19, 8); Warbling Vireo, 3; Red-eyed Vireo, 2.5; Com. Yellowthroat, 2; Red-winged Blackbird, 2; Great Crested Flycatcher, 1.5; Ovenbird, 1.5; Am. Goldfinch, 1.5; Yellow-throated Vireo, 1; Yellow Warbler, 1; Rose-breasted Grosbeak, 1; N. Oriole, 1; Ruffed Grouse, 0.5; White-breasted Nuthatch, 0.5; Chipping Sparrow, 0.5; Downy Woodpecker, +; Hairy Woodpecker, +; Blue Jay, +; Black-capped Chickadee, +; Scarlet Tanager, +. **Total:** 22 species; 44.5 territorial males ($278/\text{km}^2$, 113/100 acres). **Visitors:** Mallard, Broad-winged Hawk, Mourning Dove, Ruby-throated Hummingbird, Yellow-bellied Sapsucker, Cedar Waxwing, Indigo Bunting, Brown-headed Cowbird. **Remarks:** Overall numbers of birds were down slightly from 1982. Freezing temperatures with snow occurred in mid May and may have been a factor for some species. By mid-June caterpillars had defoliated much of the aspen but this did not appear to affect territories of the canopy species. A Ruffed Grouse with 3+ young was present in late June.—W. CALVIN M. CUTHERBERT, Box 1031, Brandon, Manitoba, Canada, R7A 6A3.

114. RIVER BOTTOM FOREST. — **Location:** Manitoba; Headingley, 3 mi SW of village and 800 m N of Hwy 241 (4 mi W of jets of Hwys 241 and 334); 49°52'N, 97°30'W, Winnipeg 62 H/14. **Continuity:** Established 1977; 7 consecutive years. **Size:** 14 ha = 34.6 acres. **Description of Plot:** See AB 33:64 (1978). **Weather:** Cool, near frost 4-5, warm and calm remainder. **Coverage:** June 4, 5, 7, 11, 14, 17, 20, 23, 27; 0500-0800 hrs. Total obs.-hours: 21. **Census:** Rose-breasted Grosbeak, 13 (93, 38); N. Oriole, 11 (79, 32); Least Flycatcher, 6 (43, 17); Am. Robin, 5 (36, 14); E. Wood-Pewee, 3.5 (25, 10); Great Crested Flycatcher, 3.5; Red-eyed Vireo, 3 (21, 9); Warbling Vireo, 2; Yellow-throated Vireo, 1.5; Yellow-bellied Sapsucker, 1; Blue Jay, 1; White-breasted Nuthatch, 1; House Wren, 1; Philadelphia Vireo, 1; Mourning Dove, +; Black-billed Cuckoo, +; Hairy Woodpecker, +; Gray Catbird, +; Black-capped Chickadee, +; Brown-headed Cowbird, +. **Total:** 20 species, 53.5 territorial males ($382/\text{km}^2$, 155/100 acres). **Visitors:** E. Kingbird, Am. Crow, Veery, Cedar Waxwing, Ovenbird, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Mourning Dove, Am. Robin (3), Rose-breasted Grosbeak. Dutch elm clearing, increased human use and a late spring adversely

affected bird populations —W. KOONZ, Dept. of Natural Resources, 1495 St. James St., Winnipeg, Manitoba, Canada. R3H 0W9.

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

The following 6 censuses are variously located on N, S, E, and W facing slopes and have experienced varied degrees of logging in the past 50 years. See AB 33:66-67 (1979) for a description of vegetation and topography.

As expected there were some declines and some increases of certain species but generally they offset each other. The Summer Tanager and Yellow-billed Cuckoo, however, decreased in 4 and 5 of the 6 grids, respectively, and remained the same in the other remaining grids.

Precipitation in May was 25% higher than the 35-year average. June and July were below average by 26% and 95%, respectively. Temperatures in May and June were near normal with a slight increase in June. Both maximum and minimum temperatures in July were higher than normal.

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

115. 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; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** June 9, 12, 14, 18, 21, 26; 0615-0930. Total obs.-hours: 16. **Census:** Tufted Titmouse, 3.5 (43, 18); Downy Woodpecker, 3 (37, 15); Yellow-billed Cuckoo, 2.5; Great Crested Flycatcher, 2.5; Blue Jay, 2.5; N. Cardinal, 2.5; Rose-breasted Grosbeak, 2.5; Red-bellied Woodpecker, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Indigo Bunting, 2; Downy Woodpecker, 1.5; Wood Thrush, 1.5; N. Parula, 1.5; Louisiana Waterthrush, 1.5; Brown-headed Cowbird, 1.5; Mourning Dove, 1; Red-bellied Woodpecker, 1; Blue-gray Gnatcatcher, 1; Scarlet Tanager, 1; Chuck-will's-widow, +; Summer Tanager, +; Rose-breasted Grosbeak, +. **Total:** 24 species, 39.5 territorial males ($488/\text{km}^2$, 198/100 acres). **Visitors:** Great Horned Owl, Swainson's Thrush. **Remarks:** Nests found: Chuck-will's-widow (1), Downy Woodpecker (2), Blue-gray Gnatcatcher (1), and N. Cardinal (1).

Predominantly on the NW $\frac{1}{4}$, NE $\frac{1}{4}$, Section 28, T-14S, R-20E; 38°48'N, 95°12'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** June 6, 8, 12, 14, 20-21; 0630-1205. Total obs.-hours: 20. **Census:** N. Cardinal, 3.5 (43, 18); Tufted Titmouse, 3 (37, 15); Great Crested Flycatcher, 2.5; Blue Jay, 2.5; Rose-breasted Grosbeak, 2; Mourning Dove, 1.5; White-breasted Nuthatch, 1.5; Indigo Bunting, 1.5; Brown-headed Cowbird, 1.5; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Hairy Woodpecker, 1; Kentucky Warbler, 1; Summer Tanager, 1; Yellow-billed Cuckoo, +; Red-eyed Vireo, +. **Total:** 16 species; 24.5 territorial males ($303/\text{km}^2$, 123/100 acres). **Visitors:** Green-backed Heron, Red-tailed Hawk, N. Flicker, Carolina Wren, Ovenbird. **Remarks:** Nests found: Downy Woodpecker, Tufted Titmouse; Kentucky Warbler feeding recently fledged juveniles. As in Wall Woods, this was the lowest number of species and density we have censused in 6 years.

117. OAK-HICKORY FOREST III.

Location: Kansas; Douglas Co., on the Univ. of Kansas Breidenthal Biological Preserve. Predominantly on the NE $\frac{1}{4}$, NE $\frac{1}{4}$, Section 28, T-14S, R-20E; 38°48'N, 95°12'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** June 6, 8, 11-12, 20, 24; 0610-1200. Total obs.-hours: 18. **Census:** Great Crested Flycatcher, 3.5 (43, 18); N. Cardinal, 3 (37, 15); Black-capped Chickadee, 2.5; Tufted Titmouse, 2.5; Kentucky Warbler, 2.5; Yellow-billed Cuckoo, 2; Hairy Woodpecker, 2; E. Wood-Pewee, 2; Blue Jay, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Indigo Bunting, 2; Downy Woodpecker, 1.5; Wood Thrush, 1.5; N. Parula, 1.5; Louisiana Waterthrush, 1.5; Brown-headed Cowbird, 1.5; Mourning Dove, 1; Red-bellied Woodpecker, 1; Blue-gray Gnatcatcher, 1; Scarlet Tanager, 1; Chuck-will's-widow, +; Summer Tanager, +; Rose-breasted Grosbeak, +. **Total:** 24 species, 39.5 territorial males ($488/\text{km}^2$, 198/100 acres). **Visitors:** Great Horned Owl, Swainson's Thrush. **Remarks:** Nests found: Chuck-will's-widow (1), Downy Woodpecker (2), Blue-gray Gnatcatcher (1), and N. Cardinal (1).

118. OAK-HICKORY FOREST IV.

Location: Kansas, Douglas Co., Sturdy's Woods. Predominantly on the NE $\frac{1}{4}$, NE $\frac{1}{4}$, Section 27, T-14S, R-20E; 38°48'N, 95°10'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 24, 26, 28, 30; June 1, 3, 7, 21; 0630-1150. Total obs.-hours: 18. **Census:** Great Crested Flycatcher, 3 (37, 15); Blue Jay, 3; Tufted Titmouse, 3; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; E. Wood-Pewee, 2; Black-capped Chickadee, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Kentucky Warbler, 2; Summer Tanager, 2; N. Cardinal, 2; Brown-headed Cowbird, 2; Yel-

116. OAK-HICKORY FOREST II.

Location: Kansas; Douglas Co., on the Univ. of Kansas Breidenthal Biological Reserve and Cedar Crest Wildlife Refuge (Cliff Woods).

low-billed Cuckoo, 1; Barred Owl, 1; Whip-poor-will, 1; Hairy Woodpecker, 1; Wood Thrush, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; N. Oriole, 1; Mourning Dove, +; Red-headed Woodpecker, +; N. Flicker, +; Brown Thrasher, +. **Total:** 25 species; 37 territorial males ($457/\text{km}^2$, 185/100 acres). **Visitors:** Red-tailed Hawk, Chimney Swift, Am. Crow, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Downy Woodpecker, Great Crested Flycatcher, Tufted Titmouse, Red-eyed Vireo, Summer Tanager.

119. OAK-HICKORY FOREST V. — **Location:** Kansas, Douglas Co., East Beisecker Woods. Predominantly on the NE $\frac{1}{4}$, NE $\frac{1}{4}$, Section 35, T-14S, R-20E; 38°48'N, 95°09'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 23, 25; June 8, 10, 14, 20, 22; July 5, 15; 0630-1155. Total obs.-hours: 20. **Census:** Tufted Titmouse, 3 (37, 15); Red-eyed Vireo, 3; Yellow-billed Cuckoo, 2; Whip-poor-will, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Blue Jay, 2; White-breasted Nuthatch, 2; Ovenbird, 2; Kentucky Warbler, 2; Rufous-sided Towhee, 2; Brown-headed Cowbird, 2; Red-bellied Woodpecker, 1; E. Wood-Pewee, 1; Black-capped Chickadee, 1; Wood Thrush, 1; Summer Tanager, 1; Scarlet Tanager, 1; N. Cardinal, 1; Rose-breasted Grosbeak, 1; N. Oriole, 1; Red-headed Woodpecker, +; Hairy Woodpecker, +; Yellow-throated Vireo, +; N. Parula, +; Louisiana Waterthrush, +. **Total:** 26 species; 35 territorial males ($432/\text{km}^2$, 175/100 acres). **Visitors:** Red-tailed Hawk, Great Horned Owl, Chimney Swift, N. Rough-winged Swallow, Am. Crow, Am. Goldfinch. **Remarks:** Nests found: Tufted Titmouse, Whip-poor-will (2), Red-bellied Woodpecker, Red-eyed Vireo, Ovenbird, Kentucky Warbler, Rufous-sided Towhee.

120. OAK-HICKORY FOREST VI. — **Location:** Kansas, Douglas Co., West Beisecker Woods. Predominantly on the SW $\frac{1}{4}$, NE $\frac{1}{4}$, Section 35, T-14S, R-30E; 38°48'N, 95°09'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 8.1 ha = 20 acres. **Coverage:** May 23, 25; June 8, 10, 14, 20, 22; July 5, 15; 0630-1155. Total obs.-hours: 21. **Census:** Red-eyed Vireo, 4 (49, 20); Tufted Titmouse, 3 (37, 15); Blue Jay, 2; Ovenbird, 2; Brown-headed Cowbird, 2; Yellow-billed Cuckoo, 1; Great Horned Owl, 1; Chuck-will's-widow, 1; Whip-poor-will, 1; Red-headed Woodpecker, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Hairy Woodpecker, 1; E. Wood-Pewee, 1; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Summer Tanager, 1; N. Cardinal, 1; Rose-breasted Grosbeak, 1; N. Oriole, 1; Mourning Dove, +; N. Flicker, +; Wood Thrush, +; Rufous-sided Towhee, +. **Total:** 25 species; 29 territorial males ($358/\text{km}^2$, 145/100 acres). **Visitors:** Red-tailed Hawk, Chimney Swift, Am. Crow, Am. Robin, Am. Redstart, Indigo Bunting, Am. Goldfinch. **Remarks:** Nests found: Red-eyed Vireo, Tufted

Titmouse, Chuck-will's-widow, Whip-poor-will, Downy Woodpecker.

121. 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; 38°48'N, 95°12'W, Baldwin City Quadrangle, USGS. **Continuity:** Established 1981; 3 consecutive years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 36:85 (1982). **Weather:** Same as for "Breeding Bird Populations of Selected Oak-Hickory Forests in Northeastern Kansas, I-VI." **Coverage:** June 5, 11, 15, 19, 24, 28; 0620-1120 hrs. Total obs.-hours: 19. **Census:** N. Cardinal, 6 (74, 30); Downy Woodpecker, 4 (49, 20); Great Crested Flycatcher, 3.5 (43, 18); Red-eyed Vireo, 3.5; Yellow-billed Cuckoo, 3 (37, 15); Black-capped Chickadee, 3; Indigo Bunting, 3; Red-bellied Woodpecker, 2; E. Wood-Pewee, 2; Blue Jay, 2; Tufted Titmouse, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; White-breasted Nuthatch, 1.5; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Blue-gray Gnatcatcher, 1; E. Bluebird, 1; Louisiana Waterthrush, 1; N. Oriole, 1; Red-tailed Hawk, +; E. Phoebe, +; Rose-breasted Grosbeak, +. **Total:** 23 species; 45.5 territorial males ($562/\text{km}^2$, 228/100 acres). **Visitors:** Green-backed Heron, Ruby-throated Hummingbird, Willow Flycatcher, Am. Crow, Brown Thrasher, Red-winged Blackbird, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Red-tailed Hawk (1), Hairy (1) and Downy Woodpecker (4). All species were very non-vocal throughout June.—ROGER L. BOYD, Biol. Dept., Baker Univ., Baldwin City, KS 66006.

122. RIPARIAN WOODLAND. — **Location:** Kansas; Morton Co., 7.5 mi N of Elkhart, NE $\frac{1}{4}$ Sec. 4, T33S, R43W; 37°07'N, 101°53'W, Elkhart N Quadrangle, USGS.

Continuity: New. **Size:** 15 ha = 37.05 acres (2×7.5 ha, measured by tape). **Description of Plot:** This is a riparian woodland corridor along the Cimarron River. Dominant woody vegetation is Plains Cottonwood and Saltcedar. A quantitative survey of the vegetation in ten 0.1-acre circular samples gave the following results: Trees 3-in. diameter and over, 133/acre; total basal area 117 ft^2 /acre. (Figures after each give number of trees/acre, relative density (%), relative dominance and relative frequency, in that sequence): Saltcedar (measured diameter of clump at 12" above ground), 74, 56, 76, 50; cottonwood, 55, 41, 23, 90; dead, 4, 3, 1, 40. Trees by diameter size class: A (3-6 in.) 12, 9, 1, 40; B (6-9 in.) 40, 30, 14, 80; C (9-15 in.) 40, 30, 23, 80; D (14-21 in.) 41, 31, 62, 30. Average canopy height 29.5 ft; ground cover 81%; 10% forbs (i.e., *Glycyrrhiza lepidota*, Soapweed, *Mentzelia nuda*, Com. Sunflower, Wild Peppergrass, Yellow Sweet Clover, *Artemesia filifolia*). Grasses comprised 90% (*Agropyron smithii*, *Andropogon hallii*, *Sporobolus cryptandrus*, *Panicum capillare*, *Eragrostis trichodes*, *Buchloe dactyloides*). There was 19% bare ground. **Edge:** The Cimarron River is on the N edge, varying from 30-75 yards from grid. The S edge is bordered by sandhills varying between 30-125 yds from grid. Both ends have similar habitat continuing up and down river. **Topography:** Relatively level at 3380 ft. **Weather:** Temp. was below average, rainfall above average, wind average. **Coverage:** May 29; June 6, 11, 19, 25; July 3; 0705-2020. Total obs.-hours: 8.66. **Census:** Mourning Dove, 18 (120, 49); W. Kingbird, 14 (93, 38); N. Oriole, 14; N. Mockingbird, 5 (33, 13); Lark Sparrow, 5; Orchard Oriole, 5; E. Kingbird, 3 (20, 8); Yellow-billed Cuckoo, 2; Brown-headed Cowbird, 2; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; Blue



BBC 122, Morton Co., KS. Riparian Woodland. Willows and oaks along Oxbow Pond. See photo in AB 25:969 (1971).

Grosbeak, 1; Red-winged Blackbird, 1. **Total:** 14 species, 73 territorial males ($487/\text{km}^2$, 197/100 acres). **Visitors:** Canada Goose, Mallard, Mississippi Kite, Swainson's Hawk, Ferruginous Hawk, Killdeer, Great Horned Owl, Com. Nighthawk, Com. Poorwill, Swainson's Thrush, Yellow-breasted Chat, Com. Grackle. **Remarks:** Nests found: N. Oriole (2), W. Kingbird (2), and Mourning Dove (12).—*TIMOTHY C. WAGNER, Dept. of Biol. Sci., Fort Hays State Univ. Hays, KS 67601.*

123. DECIDUOUS FLOODPLAIN FOREST. — **Location:** Oklahoma; Delaware Co., 4 mi S of Jay; $36^\circ 21' \text{N}$, $94^\circ 48' \text{W}$, Lake Eucha E Quadrangle, USGS. **Continuity:** Established 1979; 5 consecutive years. **Size:** 6.7 ha = 16.6 acres. **Description of Plot:** See AB 34:53 (1980). **Weather:** See Census 109. **Coverage:** May 16, 27; June 9, 19, 30; July 6; 0430-0915. Total obs.-hours: 38. **Census:** Tufted Titmouse, 9.5 (141, 57); N. Parula, 8.5 (127, 51); Yellow-billed Cuckoo, 8 (119, 48); Blue-gray Gnatcatcher, 8; Acadian Flycatcher, 7.5 (112, 45); N. Cardinal, 7.5; Indigo Bunting, 7.5; Carolina Chickadee, 7 (104, 42); Carolina Wren, 6 (89, 36); Kentucky Warbler, 6; Louisiana Waterthrush, 5.5 (82, 33); Prothonotary Warbler, 5 (74, 30); Brown-headed Cowbird, 5; Red-bellied Woodpecker, 3.5 (52, 21); White-breasted Nuthatch, 3 (45, 18); White-eyed Vireo, 3; E. Phoebe, 2; Great Crested Flycatcher, 2; Red-eyed Vireo, 2; Black-and-white Warbler, 2; Ruby-throated Hummingbird, 1.5; Great Blue Heron, 1; Chuck-will's-widow, 1; Downy Woodpecker, 1; Com. Yellowthroat, 1; Am. Goldfinch, 1; Whip-poor-will, 0.5; Yellow-breasted Chat, 0.5. **Total:** 28 species; 116 territorial males ($1727/\text{km}^2$, 699/100 acres). **Visitors:** E. Wood-Pewee, Blue Jay, Wood Thrush. **Remarks:** Nests found: Ruby-throated Hummingbird (2), Carolina Wren (2), Louisiana Waterthrush (1), N. Cardinal (1), Indigo Bunting (1). The population of Carolina Wrens has increased steadily from none in 1979.—*FREDERICK M. BAUMGARTNER, and DALE E. GAWLIK, Little Lewis Whirlwind Nature School and Sanctuary, Rte. 2, Jay, OK 74346.*

124. SCRUB OAK—MOUNTAIN MAHOGANY WOODLAND. — **Location:** Colorado; El Paso Co., 100 m W of Dwire Hall, Univ. of Colo. campus, Colorado Springs; $38^\circ 52' \text{N}$, $104^\circ 47' \text{W}$, Pikeview Quadrangle, USGS. **Continuity:** Established 1980; 4 consecutive years. **Size:** 8 ha = 19.77 acres. **Description of Plot:** See AB 35:87 (1980). **Weather:** Fair during the month of May; mostly sunny and warm through June and July with temp. in the 70's and 80's F. **Coverage:** May 5, 8, 14, 16, 22, 30; June 2-3, 5, 9, 12, 16-17, 28; July 1, 3, 7, 12, 14, 18, 21, 24, 30; Aug. 8, 17. Total obs.-hours: 35. **Census:** Rufous-sided Towhee, 6 (75, 30); Black-billed Magpie, 4 (50, 20); Am. Robin, 3.5 (44, 18); Scrub Jay, 3 (37, 15); Brewer's Blackbird, 2; Brown-headed Cowbird, 2; House Finch, 2; Mourning Dove, 1.5; Mountain Chickadee, 1; Virginia's Warbler, 1;

Black-headed Grosbeak, 1; Lesser Goldfinch, 1; N. Flicker, 0.5; Violet-green Swallow, 0.5; Am. Crow, 0.5; Am. Kestrel, +; W. Meadowlark, +. **Total:** 17 species; 29.5 territorial males ($369/\text{km}^2$, 149/100 acres). **Visitors:** Turkey Vulture, Cooper's Hawk, Red-tailed Hawk, Prairie Falcon, Rock Dove, Chimney Swift, Broad-tailed Hummingbird, Rock Wren, Yellow-rumped Warbler, House Sparrow, W. Tanager, Green-tailed Towhee. **Remarks:** Nests found: Black-billed Magpie (2).—*DEBRA J. BYERS (compiler) and DON VAN HORN, Dept. of Biol., Univ. of Colo., Colorado Springs, CO 80907.*

125. RIPARIAN WOODLAND—HANGING GARDENS. — **Location:** Utah, Washington Co., Zion Nat'l Park, Narrows trail, with the SW corner at $37^\circ 15' 20'' \text{N}$, $112^\circ 56' 51'' \text{W}$; Topographic Map, Zion Nat'l Park, Utah; Zion Natural History Ass'n, Zion Nat'l Park, Springdale, Utah 84767. **Size:** 9.7 ha = 24.0 acres (rectangular, 176 × 660 yds, measured on map). **Continuity:** New. **Description of Plot:** Elev. 4420-4500 ft. The bottom of a gorge, with the Virgin River and flood plain covering about half of the area. The remainder of the plot is covered by 3 patches of riparian woodland and by talus sand slopes. For several hundred yards along the E side of the gorge water seeping through the sandstone of the cliff has deposited tufa in which marsh plants grow; these "hanging gardens" reach a height of 60-100 ft on the 2000-ft cliff. A spring at the S end has formed a $\frac{1}{4}$ -acre swamp with Watercress, Smooth Scouring-rush, several rushes and *Baccharis emoryi*. The riparian woodland has Fremont Cottonwood, Boxelder, Canyon Maple and Canyon Wild Grape. Prairie June Grass (*Koeleria cristata*) and Smooth Scouring-rush are the main ground cover plants. The talus slopes have Canyon Maple, Boxelder, Canyon Grape and Creeping Mahonia. The principal plants of the hanging gardens are Western Shooting-star, Cliff Columbine, Golden Columbine, Scarlet Monkeyflower, Poison Ivy, S. Maidenhair Fern and several perennial grasses. **Weather:** Good rainstorms on May 11 and July 6, dry between; temp. below average. **Coverage:** May 22, 28; June 4, 10, 13, 18, 21, 26, 30; July 4, 7, 14; 0550-1030, MDT. Total obs.-hours: 30.5. **Census:** Am. Robin, 5 (51, 21); Solitary Vireo, 5; Rufous-sided Towhee, 4 (41, 17); Warbling Vireo, 3 (31, 13); Yellow Warbler, 3; Black-headed Grosbeak, 3; Song Sparrow, 3; Black-capped Chickadee, 2; Black-throated Gray Warbler, 2; Spotted Sandpiper, 1; Am. Dipper, 1; Gray Vireo, 1. **Total:** 12 species; 33 territorial males ($340/\text{km}^2$, 138/100 acres). **Visitors:** White-throated Swift, hummingbird sp., Violet-green Swallow, W. Tanager. **Remarks:** This study was established because of several Park Service reports of nesting Winter Wrens along the Narrows trail during the past 2 years. No sign of Winter Wrens was found, but the study was not conclusive; the roar of high river water against the cliffs of the canyon walls drowned out the taped wren songs, and could have drowned out the response of a live wren. On the night of June 17-18 a rock

fall from the cliff above destroyed a section of the hanging gardens where 1 wren had been reported and ruined a section of newly completed concrete trail.—*JEROME L. GIFFORD, P.O. Box 85, Springdale, UT 84767*

126. NARROW CREEKSIDER MIXED RIPARIAN WOODLAND. — **Location:** California; San Diego Co., N of Fallbrook, near the border of San Diego and Riverside Co., beginning at the confluence of Sandia Creek and the Santa Margarita River and spanning the creek banks upstream for about 1.3 mi; beginning in the NE $\frac{1}{4}$ Section 12 and continuing to the NE $\frac{1}{4}$ of Section 1, T9S, R4W, Temecula Quadrangle, USGS. **Continuity:** New (1982). **Size:** 12.95 ha = 32.0 acres (irregularly shaped, following the winding stream course, approximately 6,865 × 203 ft, measured with tape and compass and checked by planimetry of 1982 aerial photo, scale 1:6,000). **Description of Plot:** A narrow belt of mixed woodland (willows, cottonwoods, California Sycamore, and Coast Live Oak) with some monotypic willow woodland and associated riparian growth, oriented roughly N-S and situated along a narrow creek that ranged from about 18-30 ft wide and 1-2 ft deep. The riparian belt ranged in size 115-300 ft wide. The habitat is relatively undisturbed, however, 1 house located on approximately 1 acre of cleared land with associated cultivars was located near the N end. Flowing water was present along the length of the plot during the entire period. General habitat types and vegetation were assessed along 744.7 m of transect. Ground cover contributed by lower-growing plants (below 6 ft) was analyzed using the line intercept method along the transects. Number of tree stems and dbh for each were recorded over a 1489.4 m² (744.7 × 2) area. Canopy cover in woodland habitats was assessed by sighting through an ocular tube with crosshairs at each meter of transect (1 reading on each side of the transect tape) such that 202 readings were recorded for every 100 m of transect length. The plot was composed of 60.6% mixed woodland, 14.2% herbaceous to sub-shrubby riparian vegetation, 12% short willow woodland (less than 5 m tall), 3.8% oak-willow woodland, 2.3% scour channel with herbaceous to sub-shrubby riparian vegetation, and 7.1% flowing water. A total of 212 trees (576 per acre) (includes a few arborescent shrubs) was encountered along the transects. There were 3 species of willow present in 5 size categories (class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.): Arroyo Willow a-53, b-43, c-8, d-1; Pacific Willow a-13, b-4, c-1, d-1, e-2, Red Willow a-9, b-1. Two species of cottonwood were present in 4 size classes: Black Cottonwood a-11, c-3, d-3; Fremont Cottonwood b-1. California Sycamore was present in 6 classes: a-12, b-4, c-2, d-6, e-2, f-2 (f = 21-27 in.). Coast Live Oak was present in 6 size classes: a-11, b-3, c-3, d-1, e-4, f-1. Tree Tobacco was present in 2 size classes: a-3, b-3; 1 Toyon occurred in size class a. A total of 4 snags was encountered; a-2, e-1, f-1. Average tree canopy cover (%) and tree stem densities, respectively (per 100 m² followed in parentheses)

ses by per acre) were 50% and $58/100 \text{ m}^2$ ($2,348/\text{acre}$) in short willow woodland, 65.3 and 10 (405) in oak-willow woodland and 65.2 and 16.1 (652) in mixed woodland. Seventy-four species of plants contributed a total of 54.5% ground cover over the entire plot. When three-dimensional ground cover overlap is included (more than 1 species covered the same piece of ground) this figure increases to 96.7%. The 12 most abundant ground cover plants contributed 75.6% cover and the relative percentage of each (based on 100% total) were: Desert Grape, 18.2%; W. Poison-oak, 13.4%; W. Blackberry, 10.4%; Arroyo Willow, 8.4%; California Mugwort, 5.5%; Mulefat, 5.1%; wild oats (*Avena spp.*), 4.2%; Pacific Willow, 2.8%; Black Cottonwood, 2%; W. Ragweed, 2%; White Sweet Clover, 1.9%; and Durango-root, 1.7%; 62 additional species contributed the remaining 24.4%. **Edge:** Bounded by Sandia Creek road to the E and by upland habitats, mostly chaparral with patchy coastal sage scrub to the W and beyond the narrow road on the E. Riparian woodland habitats were continuous with the woodland habitats of the Santa Margarita River to the S and along Sandia Creek to the N. Bands of Coast Live Oaks and scattered individuals occurred along and intermixed with the shrublands. **Topography:** Elevation varied from about 310 ft on the S to 400 ft on the N. The W side was locally very steep; there was an average slope of about 43% over 7.3 acres. **1982: Weather:** Clear and sunny on 3 counts, overcast at start to sunny by late count on 3, with overcast skies and intermittent light drizzle on 2. Temp. range, about $56^\circ\text{-}85^\circ\text{F}$. **Coverage:** Apr. 20, 22, 27; May 7, 17, 26-27; June 2; 0630-1145 hrs. Total obs.-hours: 41. **Census:** Song Sparrow, 43 (332, 134); House Wren, 23 (178, 72); Lesser Goldfinch, 20 (154, 63); Anna's Hummingbird, 14 (108, 44); Com. Yellowthroat, 14; Bushtit, 13 (100, 41); Rufous-sided Towhee, 12 (93, 38); Plain Titmouse, 11 (85, 34); Orange-crowned Warbler, 11; Ash-throated Flycatcher, 10 (77, 31); Hutton's Vireo, 10; Brown Towhee, 10; W. Wood-Pewee, 9 (69, 28); Nuttall's Woodpecker, 7 (54, 22); Black-headed Grosbeak, 7; Wrentit, 6 (46, 19); Black-chinned Hummingbird, 5 (39, 16); Bewick's Wren, 5; Brown-headed Cowbird, 5; W. Flycatcher, 4.5 (35, 14); Costa's Hummingbird, 4 (31, 13); Scrub Jay, 4; California Quail, 3 (23, 9); Phainopepla, 3; Eur. Starling, 3; N. Oriole, 2.5; Acorn Woodpecker, 2; N. Flicker, 2; Cooper's Hawk, 1; Red-shouldered Hawk, 1; Red-tailed Hawk, 1; Mourning Dove, 1; Black Phoebe, 1; California Thrasher, 1; Yellow Warbler, 1; Hooded Oriole, 1; House Finch, 1; Lawrence's Goldfinch, 1; Am. Goldfinch, 1; Belted Kingfisher, 0.5; Yellow-breasted Chat, 0.5. **Total:** 41 species; 275 territorial males or females ($2124/\text{km}^2$, $859/100 \text{ acres}$). **Visitors:** (Number is maximum observed on any single visit) White-throated Swift, 25; Band-tailed Pigeon, 20; Yellow-rumped Warbler, 11; Cliff Swallow, 9; Rock Dove, 6; Wilson's Warbler, 5; W. Tanager, 5; Violet-green Swallow, 4; N. Rough-winged Swallow, 3; Black-throated Gray Warbler, 3; House Sparrow, 3; Townsend's Warbler, 2;

Turkey Vulture, 1; Am. Kestrel, 1; Spotted Sandpiper, 1; W. Kingbird, 1; Ruby-crowned Kinglet, 1; Swainson's Thrush, 1; Nashville Warbler, 1; Golden-crowned Sparrow, 1. **Remarks:** Nests found (49): Anna's Hummingbird (7), Bushtit (4), House Wren (4), Lesser Goldfinch (4), Costa's Hummingbird (3), W. Wood-Pewee (2), Ash-throated Flycatcher (2), Plain Titmouse (2), Phainopepla (2), Eur. Starling (2), Orange-crowned Warbler (2), Song Sparrow (2), Cooper's Hawk (1), Red-shouldered Hawk (1), Red-tailed Hawk (1), Black-chinned Hummingbird (1), Acorn Woodpecker (1), Nuttall's Woodpecker (1), N. Flicker (1), Scrub Jay (1), Bewick's Wren (1), Wrentit (1), Hutton's Vireo (1), Hooded Oriole (1); N. Oriole (1). **1983: Weather:** Clear on 5 censuses, with overcast at the beginning to sunny by the end of 3 visits. Temp. range, about $55^\circ\text{-}80^\circ\text{F}$. **Coverage:** Apr. 5, 13, 19; May 11, 17, 24; June 3; 0700-1125 and 1230-1600 hrs. Total obs.-hours: 26.5. **Census:** Song Sparrow, 45 (347, 141); House Wren, 30.5 (236, 95); Lesser Goldfinch, 21 (162, 66); Bushtit, 17 (131, 53); Com. Yellowthroat, 15 (116, 47); Plain Titmouse, 14 (108, 44); Rufous-sided Towhee, 14; Wrentit, 13 (100, 41); Orange-crowned Warbler, 11 (85, 34); Hutton's Vireo, 9 (69, 28); Brown Towhee, 9; W. Wood-Pewee, 8.5 (66, 27); Anna's Hummingbird, 7.5 (58, 23); Ash-throated Flycatcher, 7.5; Nuttall's Woodpecker, 6 (46, 19); Bewick's Wren, 6; Yellow Warbler, 6; Black-headed Grosbeak, 5.5 (42, 17); W. Flycatcher, 5 (39, 16); Scrub Jay, 4.5 (35, 14); N. Flicker, 3.5 (27, 11); N. Oriole, 3 (23, 9); Black-chinned Hummingbird, 2.5; Acorn Woodpecker, 2; California Thrasher, 2; Phainopepla, 2; Eur. Starling, 2; Hooded Oriole, 2; House Finch, 2; California Quail, 1.5; Red-shouldered Hawk, 1; Red-tailed Hawk, 1; Am. Kestrel, 1; Black Phoebe, 1; Yellow-breasted Chat, 1; Brown-headed Cowbird, 1; Cooper's Hawk, +; Killdeer, +; Mourning Dove, +; Costa's Hummingbird, +; Belted Kingfisher, +; W. Kingbird, +; N. Rough-winged Swallow, +; Lazuli Bunting, +; Rufous-crowned Sparrow, +. **Total:** 45 species; 283.5 territorial males or females ($2189/\text{km}^2$, $886/100 \text{ acres}$). **Visitors:** (Number is maximum observed on any single visit.) Black-crowned Night-Heron, 1; Turkey Vulture, 1; Black-shouldered Kite, 1; Rock Dove, 5; Band-tailed Pigeon, 2; White-throated Swift, 3; Downy Woodpecker, 1; Olive-sided Flycatcher, 1; Com. Raven, 1; Canyon Wren, 1; Ruby-crowned Kinglet, 2; Am. Robin, 2; N. Mockingbird, 1; Solitary Vireo, 1; Warbling Vireo, 3; Yellow-rumped Warbler, 38; Wilson's Warbler, 3; W. Tanager, 2; Golden-crowned Sparrow, 2. **Remarks:** Nests found (34): Bewick's Wren (3), Anna's Hummingbird (2), Nuttall's Woodpecker (2), N. Flicker (2), W. Wood-Pewee (2), Ash-throated Flycatcher (2), Bushtit (2), House Wren (2), Eur. Starling (2), Orange-crowned Warbler (2), Lesser Goldfinch (2), Red-shouldered Hawk (1), Red-tailed Hawk (1), Am. Kestrel (1), Black-chinned Hummingbird (1), Acorn Woodpecker (1), W. Flycatcher (1), Plain Titmouse (1), Hutton's Vireo (1), Black-headed Grosbeak (1), Song Sparrow (1), Hooded Ori-

ole (1). The largest changes observed in the number of breeding pairs were increases of House Wrens and Yellow Warblers, whereas the hummingbirds were down.—RICHARD ZEMBAL, DAVID BONTRAGER, and THOMAS SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

127. NARROW RIVERINE WILLOW AND MIXED WOODLANDS. — Location:

California; San Diego Co., about $1\frac{1}{2}$ mi NNW of Fallbrook along the Santa Margarita River. About $\frac{1}{4}$ of the plot lies downstream and the remainder upstream of the Deluz Road Crossing of the river within the NE $\frac{1}{4}$ Section 14, NW extreme Section 13, and along the extreme bottom center Section 12, T9S, R4W, Fallbrook Quadrangle, USGS Continuity: New (1982). **Size:** 13.16 ha = 32.5 acres (sinuously rectangular, along the river bottom, approximately $6,000 \times 236$ ft, measured with tape and compass and checked by planimetry of a 1982 color aerial photo, scale 1:6,000). **Description of Plot:** A narrow belt of willow and mixed woodlands (including California Sycamore, and Coast Live Oak that spans the river bottom for about 1.4 miles, oriented E-W for about $\frac{1}{4}$ of its length and roughly N-S for the remainder. Flowing water was present during the entire period. General habitat types and vegetation were assessed along a total of 778 m of transects. Plant cover below 6 ft tall was analyzed with line intercept along the transects; number of tree stems and dbh for each were recorded over a 1556 m^2 (778×2) area; and canopy cover in woodland habitats was assessed by sightings through an ocular tube with cross-hairs at each meter point of transect with a reading on both sides of the transect tape, such that 202 readings were taken for a 100 m length of transect. The plot was composed of 29.5% mixed woodland, 28.7% short willow woodland (less than 5 m tall), 14.1% tall willow woodland (greater than 5 m tall), 13.1% scour channel with low riparian growth, and 14.6% flowing water, as determined by linear measurements along the transects. A total of 909 trees ($2,365/\text{acre}$) was encountered in transects. There were 4 species of willows present in 4 size classes (class a, 0-1.5 in. dbh, b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.): Arroyo Willow, a-601, b-36, c-4, d-1; Googding Willow, a-1, c-3; Hinds Willow, a-20; and Pacific Willow, a-172, b-38, c-14, d-6. Twelve sycamores were encountered in 4 size classes: a-3, b-5, c-3, d-1. One Coast Live Oak was recorded in size class a. A total of 10 snags was encountered: a-7, b-1, c-2. Average tree canopy cover and stem densities were: 28.9% and $52.1/100 \text{ m}^2$ ($109/\text{acre}$) in mixed woodland, 61.5% and $124/100 \text{ m}^2$ ($5,020/\text{acre}$) in short willow woodland; and 42.1% and $46/100 \text{ m}^2$ ($1,862/\text{acre}$) in tall willow woodland. Low ground cover (below 6 ft) was contributed by 74 species of plants and totaled 38.8% over the entire plot, although factoring in cover overlap (more than 1 species covering the same plot of ground) yielded a ground cover estimate of 144.5%. The 21 most abundant low ground cover plants contributed 86.5% of

the total cover and the relative percent of each (based upon 100% total) was: Arroyo Willow, 23.6%; Pacific Willow, 12.8%; W. Poison-oak, 5.2%; Com. Cocklebur, 4.4%; Mulefat, 4.3%, White Sweet Clover, 4.0%; Desert Grape, 3.7%; Sour-Clover, 3.3%; scouring-rush, 3%; Hinds Willow, 2.9%; W. Blackberry, 2.8%; pigweeds, 2.5%; Water-Speedwell, 2%, brome grasses (*Bromus spp.*), 1.8%; Wild Buckwheat, 1.7%; Miner's-Lettuce, 1.6%; Bermuda Grass (*Cynodon dactylon*), 1.6%; Telegraph-Weed, 1.4%; Olney's Bulrush, 1.4%; California Sycamore, 1.4%; and California Mugwort, 1.1%. **Edge:** Similar riparian habitat is continuous for miles along the Santa Margarita River both up and downstream. The Deluz Road (2 lane, paved) runs along 1 side for about ¾ of the plot length. Steep hillsides rise out of the river basin with chaparral along 1 side, mostly the more shaded exposures particularly N-facing slopes, and coastal sage scrub along the other slope. The slope bottoms and gullies along the slopes are lined with stands and scattered individuals of Coast Live Oak. **Topography:** Local topographic relief is slight and comprised of a few feet difference between vegetated bars and the bottoms of river and scour channels. The plot slopes from the upstream edge (NE) at 300 ft to about 280 ft at the downstream edge. **1982: Weather:** Clear on 2 counts, partially cloudy on 1, overcast on 5 with misting rain on 2 of these. Temp. range, high 50s-mid 70s°F. **Coverage:** Apr. 28; May 3, 10, 20, 24, 27; June 3, 8; 0530-1130 hrs. Total obs.-hours: 35.7. **Census:** House Wren, 36 (274, 111); Song Sparrow, 36; Rufous-sided Towhee, 14.5 (110, 45); Lesser Goldfinch, 10.5 (80, 32); Orange-crowned Warbler, 9.5 (72, 29); Anna's Hummingbird, 8 (61, 25); Hutton's Vireo, 7.5 (57, 23); Brown Towhee, 7.5; W. Wood-Pewee, 6 (46, 18); Com. Yellowthroat, 6; Black-headed Grosbeak, 5.5 (42, 17); Ash-throated Flycatcher, 4.5 (34, 14); Yellow Warbler, 4.5; N. Flicker, 3 (23, 9); Black-chinned Hummingbird, 2.5; Bewick's Wren, 2.5; Costa's Hummingbird, 2, Bushtit, 2; California Quail, 1.5; Black Phoebe, 1.5; Red-tailed Hawk, 1; Com. Poorwill, 1; W. Screech Owl, 1; Belted Kingfisher, 1, W. Flycatcher, 1; Scrub Jay, 1; Plain Titmouse, 1; Rock Wren, 1; Swainson's Thrush, 1; Brown-headed Cowbird, 1; Nuttall's Woodpecker, 0.5; Wrentit, 0.5; Canyon Wren, 0.5; California Thrasher, 0.5; Phainopepla, 0.5; Red-shouldered Hawk, +; Mourning Dove, +; Acorn Woodpecker, +; N. Rough-winged Swallow, +; Cliff Swallow, +. **Total:** 40 species; 183.5 territorial males or females ($1,395/\text{km}^2$, 565/100 acre). **Visitors:** (Number is maximum observed individuals on any single visit) Great Blue Heron, 1; Turkey Vulture, 1; Am. Kestrel, 1; Tree Swallow, 4; Barn Swallow, 15; Com. Raven, 5, Ruby-crowned Kinglet, 1; Warbling Vireo, 2, Yellow-rumped Warbler, 6; Townsend's Warbler, 2; Lazuli Bunting, 1; Rufous-crowned Sparrow, 1; White-crowned Sparrow, 5; Hooded Oriole, 1; N. Oriole, 3; Lawrence's Goldfinch, 4. **Remarks:** Nests located (13): Red-tailed Hawk (1), Black-chinned Hummingbird (2), Anna's Humming-

bird (1), Costa's Hummingbird (1), Belted Kingfisher (1), N. Flicker (1), W. Wood-Pewee (1), Black Phoebe (1), Rock Wren (1), House Wren (1), Song Sparrow (2). —THOMAS A. SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

128. OPEN CREEKSIDE MIXED WOODLAND.

Location: California; San Diego Co., on Camp Pendleton along Deluz Creek about 0.6 mi upstream of the mouth of Roblar Canyon; about 80% within the center of the upper ½ of Section 17, with the remainder in the SE ¼ Section 8, T9S, R4W, Fallbrook Quadrangle, USGS. **Continuity:** New (1982). **Size:** 12.5 ha = 30.9 acres (irregularly shaped along the winding creek bed, roughly $3,250 \times 415$ ft, measured with tape and compass and by planimetry of a 1982 color aerial photo, scale 1:6,000). **Description of Plot:** A band of mixed woodland with scattered stands and individuals of willow, Coast Live Oak, and slightly less abundant California Sycamore. The understory cover is dense amongst the trees, but the creek bed and associated abundant sandbars were mostly sparsely vegetated. The water course was up to 95 ft wide and flowing water was present during the entire period. Sparsely vegetated creekside sandbars were as wide as 155 ft. The creek bottom is oriented roughly N-S. The general habitat types and vegetation were assessed along 790 m of transects. Low plant cover (below 6 ft) were analyzed using the line intercept method along the transects; number of tree stems and dbh of each were recorded over a 1580 m^2 (790 m × 2) area; and canopy cover in woodland habitats was assessed by sighting through an ocular tube with cross-hairs at each meter of transect (1 sighting on each side of the transect tape), such that 202 sightings were taken for every 100 m of transect. The plot included approximately 53.9% open mixed woodland, 27.8% scour channel and sparsely vegetated sandbar, 12.1% herbaceous to sub-shrubby riparian growth, 5.5% oak woodland, and 0.7% water course, as determined by linear measurements along the transects. A total of 126 trees (323/acre) was encountered along transects. Three species of willow were present in 3 size classes and 4 other species of trees (or arborescent shrub) were encountered in a total of 7 size classes (size class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.; f, 15-21 in.; and g, 33-39 in.): Arroyo Willow, a-55, b-7, c-2; Pacific Willow, a-5, b-3, c-2; Hinds Willow, a-2; California Sycamore, a-1, b-2, d-5, e-5, f-1, g-2; Coast Live Oak, c-3, d-1, e-1, f-5; Mexican Elder, a-6, b-13, c-3; and Hollyleaf Coffeeberry, a-2. Average tree canopy cover and tree stem densities were 69.6% and 8 stems/ 100 m^2 (324/acre) in oak woodland and 43.9% and 8.1/100 m² (328/acre) in mixed woodland. Low ground cover was contributed by 81 species of vascular plants and totalled 64% over the entire plot. Where low ground cover occurred factoring in overlap (more than 1 species covering the same piece of ground) yields a cover estimate of 114.5%. The 17

most abundant low cover plants contributed 80.5% of the total cover and the relative percent of each (based upon 100% total) was: W. Poison-oak, 19.3%; wild oats (*Avena spp.*), 15.4%; Mexican Elder, 6.2%; W. Blackberry, 5.8%; Mulefat, 4.7%; Dragon Sage, 4.7%; Umbrella-Sedges, 3.2%; White Sage, 3%; Arroyo Willow, 2.9%; Squaw Bush, 2.9%; California Mugwort, 2.5%; Water-Speedwell, 2.3%; Coast Live Oak, 2%; W. Ragweed, 1.6%; California Wild Rose, 1.5%; Rabbit's Foot Grass (*Polypogon monspeliensis*), 1.3% and Douglas Mulefat, 1.2%. **Edge:** The woodland continues along Deluz Creek to the N and S. Bounded on the E and W by steep hillsides with coastal sage scrub, chaparral, and fringing stands or scattered individuals of Coast Live Oak. **Topography:** Elevations ranged from about 210 ft at the downstream or S edge to about 260 ft at the N edge. **1982: Weather:** Overcast on 6 visits with clearing by early-mid trip on 3; clear and sunny on 2 visits. Temp. range, 50-70°F. **Coverage:** Apr. 19-20, 26; May 3, 10, 13, 21, 24; 0610-1145 hrs. Total obs.-hours: 34.3. **Census:** House Wren, 24 (192, 78); Song Sparrow, 14 (112, 45); Com. Yellowthroat, 11 (88, 36); Rufous-sided Towhee, 6.5 (52, 21); Mourning Dove, 6 (48, 19); Bushtit, 6; Eur. Starling, 6; Hutton's Vireo, 6; Orange-crowned Warbler, 6; Ash-throated Flycatcher, 5.5 (44, 18); Scrub Jay, 5 (40, 16); Plain Titmouse, 5; Lesser Goldfinch, 5; Black-chinned Hummingbird, 4 (32, 13); Nuttall's Woodpecker, 3 (24, 10); Black-headed Grosbeak, 3; Brown-headed Cowbird, 3 (females); Wrentit, 2.5; Brown Towhee, 2.5; Com. Barn-Owl, 2; Acorn Woodpecker, 2; N. Flicker, 2; W. Wood-Pewee, 2; N. Oriole, 2; Am. Kestrel, 1.5; Bewick's Wren, 1.5; California Thrasher, 1.5; Cooper's Hawk, 1; Red-tailed Hawk, 1; California Quail, 1; Killdeer, 1; W. Screech-Owl, 1; Com. Poorwill, 1; Phainopepla, 1; Yellow-breasted Chat, 1; House Finch, 1; Mallard, +; Anna's Hummingbird, +; W. Flycatcher, +; Lazuli Bunting, +. **Total:** 40 species; 147.5 territorial males or females ($1,180/\text{km}^2$, 477/100 acres). **Visitors:** (Numbers are maximum observed on a single visit) Turkey Vulture, 2; White-throated Swift, 5; Belted Kingfisher, 1; W. Kingbird, 2; Cliff Swallow, 1; N. Raven, 2; Cedar Waxwing, 12; Yellow Warbler, 1; Yellow-rumped Warbler, 2; Black-throated Gray Warbler, 1; Townsend's Warbler, 3; Hermit Warbler, 2; Wilson's Warbler, 5; W. Tanager, 2; Dark-eyed Junco, 5. **Remarks:** Nest found (41): House Wren (11), Eur. Starling (6), Mourning Dove (4), Black-chinned Hummingbird (3), Plain Titmouse (3), N. Flicker (2), Com. Yellowthroat (2), Song Sparrow (2), N. Oriole (2), Red-tailed Hawk (1), Ash-throated Flycatcher (1), Scrub Jay (1), Bushtit (1), Phainopepla (1), Lesser Goldfinch (1). —DAVID R. BONTRAGER, U. S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

129. RIPARIAN OAK WOODLAND.

Location: California; Sacramento Co.; Ancil Hoffman Co. Park, along the W bank of

the American River in Carmichael, 38°37'N, 121°18'W, Fair Oaks Quadrangle, USGS. **Continuity:** Established 1971; 4 intermittent years. **Size:** 13 ha = 32 acres. **Description of Plot:** See AB 25:967-969 (1971). **Weather:** Heavy rains in winter and spring set an all-time high record for rainfall in the area. Frequent showers into first week of May, declining thereafter. Late May through June essentially dry, as is normal. **Coverage:** Apr. 2, 7, 9, 12, 22, 23, 24; May 3, 7-8, 14-15, 20, 22, 25; June 4, 7, 11, 25 (additional visits on Mar. 19, 26); between 0600-1100 hours. Total obs.-hours: 44. **Census:** Eur. Starling, 31 (239, 97); Plain Titmouse, 11.5 (89, 36); Bewick's Wren, 10 (77, 31); Rufous-sided Towhee, 9 (69, 28); Bushtit, 8.5 (66, 27); Scrub Jay, 7 (54, 22); Acorn Woodpecker, 6.5 (50, 20); House Wren, 6 (46, 19); California Quail, 5 (39, 16); Nuttall's Woodpecker, 4 (31, 13); Tree Swallow, 3 (23, 9); Mourning Dove, 2.5; Ash-throated Flycatcher, 2.5; White-breasted Nuthatch, 2.5; Anna's Hummingbird, 2; N. Flicker, 2; Yellow-billed Magpie, 2; Brown-headed Cowbird, 1.5; Ring-necked Pheasant, 1; Downy Woodpecker, 1; House Sparrow, 1; Wood Duck, 0.5; Black-shouldered Kite, 0.5; Red-shouldered Hawk, 0.5; Am. Crow, 0.5; Mallard, +; Am. Kestrel, +; Great Horned Owl, +; Black Phoebe, +; W. Kingbird, +; N. Mockingbird, +. **Total:** 32 species; 122 territorial males or females ($942/\text{km}^2$, 381/100 acres). **Visitors:** Green-backed Heron, Red-tailed Hawk, Com. Barn-Owl, W. Wood-Pewee, W. Flycatcher, N. Rough-winged Swallow, Barn Swallow, Am. Robin, Hutton's Vireo, Black-headed Grosbeak, N. Oriole, House Finch, Am. Goldfinch. **Remarks:** Nests found: Red-shouldered Hawk (1), Anna's Hummingbird (1), Acorn Woodpecker (5), Nuttall's Woodpecker (1), Downy Woodpecker (1), N. Flicker (1), Tree Swallow (2), Scrub Jay (1), Yellow-billed Magpie (2), Plain Titmouse (1), Bushtit (3), White-breasted Nuthatch (1), House Wren (2), Eur. Starling (31), House Sparrow (1). Recently fledged Black-shouldered Kites and Am. Kestrels were seen. Strong winds and heavy rains in April destroyed some nesting attempts, particularly those of Bushtits. The minimum numbers of adults in attendance at Acorn Woodpecker nests were 2, 2, 3, 3, and 5. Since the last census in 1973, relatively limited changes have occurred. A nature center was built just outside the NW corner, and some changes in the trail network have been made. There seem to be a few more dead trees than there were in the early 1970s, although data for a quantitative comparison are lacking. This latter development has apparently enhanced the area as far as cavity-nesting species are concerned. Populations of these species have either remained steady or (most cases) increased since the earlier censuses. Two cavity-nesters (Tree Swallow and House Sparrow) now nest, but were not found on earlier censuses. It is interesting to note that a nearly three-fold increase in the number of nesting Eur. Starlings since 1973 has not been associated with declines in populations of other cavity-nesting species.

The species exhibiting population declines since the last census were California Quail, Brown Towhee and W. Meadowlark, the latter 2 species being completely absent in 1983.—*ANNETTE, TIM, and ELLEN MANOLIS, 3532 Winston Way, Carmichael, CA 95806.*

130. RIVERLINE AND CREEKSIDE RIPARIAN WOODLANDS. — Location:

California; San Diego Co., about 3 miles NE of Fallbrook at the confluence of the Santa Margarita River and Rainbow Creek, located mostly within NE $\frac{1}{4}$ Section 8, with the NE tip in SE $\frac{1}{4}$ Section 5, T9S, R3W, Temecula Quadrangle, USGS. **Continuity:** New (1982). **Size:** 9.75 ha = 24.1 acres (L-shaped with smaller arm extending up Rainbow Creek and the remainder, roughly 85% of plot, extending up the river, measured partially with tape and compass and in total by planimetry of a 1982 color aerial photo, scale 1:6,000). **Description of Plot:** About 15% comprises the mixed woodland (willows, California Sycamore, and Coast Live Oak) along Rainbow Creek and the remainder is mostly willow woodland with some mixed woodland along the river, mostly upstream from the creek mouth. The riverine riparian varies from about 250-390 ft wide and the creekside riparian is 150-250 ft wide. The plot extends upriver for about 3,000 ft and upcreek for about 520 ft. The 2 water courses were 6-12 ft and about 30 ft wide and both contained flowing water during the entire period. General habitat types and vegetation were assessed along a total of 757.7 m of transects. Low plant cover (below 6 ft) was analyzed by line intercept along the transects; counts of tree stems and stem diameters were recorded in a 1515.4 m^2 area (757.7×2 m); and canopy cover was assessed with 2 sightings through an ocular tube with crosshairs at each meter point (1 reading on each side of the transect tape) in woodland, such that 202 readings were taken along a 100 m length of transect. The plot included approximately 45.1% tall willow woodland (greater than 5 m tall), 25.3% mixed woodland, 8.0% short willow woodland (less than 5 m tall), 8.4% scour channel with patchy riparian growth, 6.5% herbaceous to sub-shrubby riparian growth, 3% disturbed riparian (the result of ORV activities), and 3.7% flowing water as determined by linear measurements in the belt transects. A total of 1,111 trees (2,974/acre) was encountered in the belt transects. There were 2 species of willow and hybrids present in 5 size classes (class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.): Arroyo Willow, a-761, b-123, c-20, d-3, e-3; Pacific Willow, a-109, b-30, c-14, d-4; hybrid willows, a-18, b-10. Sycamore occurred in 3 size classes: c-1, d-2, f (33-39 in.). 2. Coast Live Oak was encountered, b-4; as was Tree Tobacco, a-6; and Mexican Elder, a-1. Nine standing snags were also encountered: a-7, b-1, c-1. Average tree canopy cover and tree stem densities were: 65.6% and 111.1 trees/ 100 m^2 ($4,498/\text{acre}$) in tall willow woodland; 73.9% and 30/ 100 m^2 ($1215/\text{acre}$) in mixed woodland; and 23.4 and 190/ 100 m^2 ($7692/\text{acre}$) in short willow woodland. Low

ground cover (below 6 ft) was contributed by 50 species of vascular plants and totaled 54% over the entire plot, although the addition of cover overlap (more than 1 species covering the same piece of ground) yields a ground cover estimate of 87.5%. The 12 most abundant low ground cover plants contributed 84.7% of the total cover and the relative percent of each (based upon 100% total) was Desert Grape, 23.7%; Arroyo Willow, 23.1%; Pacific Willow, 8.5%; California Mugwort, 4.6%; Miner's-Lettuce, 4.4%; Wild Oats (*Avena spp.*), 4.3%; W. Blackberry, 3.4%; Mulefat, 3.4%; W. Poison-oak, 3%; sweet clover, 2.8% Mexican Elder, 1.8%; and Com. Cocklebur, 1.7%. **Edge:** Similar riparian habitat continues for miles along the Santa Margarita River above and below the plot and also along Rainbow Creek to the E. The river bottom habitats here are bordered by chaparral, mostly on steep slopes with stands and individuals of coast live oak most prevalent at the transition zone between riverine and shrubland/slope habitats. Annual grasslands and a dirt road parallel the E side of the river in a belt that varies from once to twice as wide as the riverine riparian belt and lies between the plot and the hillside chaparral Elder and a few planted trees are scattered in the grasslands with locally abundant coast live oaks. **Topography:** Elevations varied from 460 ft at the upstream creek edge to 400 ft at the downstream river edge, and about 460 ft at the upstream river edge. Local relief was not great and comprised the difference of a few feet between water or scour channel bottoms and slightly higher bars. **1982 Weather:** Overcast on 3 visits with clearing by late count on 2 of these. Temp. about 50-75°F. **Coverage:** Apr. 27; May 4, 11-12, 16, 18, 25; June 1; 0605-1130 hrs. Total obs.-hours: 37.5 **Census:** Song Sparrow, 21 (215, 87); Bewick's Wren, 12.5 (128, 52); Wrentit, 11 (113, 46); Rufous-sided Towhee, 9 (92, 37); Black-headed Grosbeak, 9; Bushtit, 8 (82, 33); Mourning Dove, 6 (62, 25); House Wren, 6; Orange-crowned Warbler, 6; Brown Towhee, 6; Lesser Goldfinch, 6; Yellow-breasted Chat, 5 (51, 21); Ash-throated Flycatcher, 3.5 (36, 15); Scrub Jay, 3.5; Plain Titmouse, 3.5; Hutton's Vireo, 3.5; Yellow Warbler, 3.5; Black-chinned Hummingbird, 3 (31, 12); W. Wood-Pewee, 3; California Thrasher, 3; Brown-headed Cowbird, 3 (females); Nuttall's Woodpecker, 2; N. Flicker, 1.5; N. Oriole, 1.5; Am. Kestrel, 1; California Quail, 1; Belted Kingfisher, 1; Acorn Woodpecker, 1; Downy Woodpecker, 1; Swainson's Thrush, 1; Bell's Vireo, 1; Red-tailed Hawk, 0.5; Blck-shouldered Kite, +; Red-shouldered Hawk, +; Anna's Hummingbird, +; W. Flycatcher, +; Black Phoebe, +; Lazuli Bunting, +; Rufous-crowned Sparrow, +; House Finch, +. **Total:** 40 species; 147.5 territorial males or females ($1512/\text{km}^2$, 612/100 acres) **Remarks:** Nests found (28): Orange-crowned Warbler (6), Mourning Dove (4), House Wren (4), Black-headed Grosbeak (3), Black-chinned Hummingbird (2), Plain Titmouse (2), Lesser Goldfinch (2), Ash-throated Flycatcher (1), Wrentit (1), Bell's Vireo (1), Yellow Warbler (1), Yellow-breasted Chat (1)

1983 Weather: Clear and mostly sunny on 5 trips to overcast or partly cloudy with at least some hazy sun on 3 trips; with light drizzle on a small part of 1. Temp. about 47-77°F. **Coverage:** Apr. 5, 19, 27; May 3, 9, 19, 24; June 2, 0630-1145 hrs. Total obs.-hours: 33.25. **Census:** Song Sparrow, 25.5 (261, 106); Bushtit, 12 (123, 50); Rufous-sided Towhee, 12, Wrentit, 11 (113, 46); Black-headed Grosbeak, 11; Bewick's Wren, 10 (103, 41); Orange-crowned Warbler, 10; Lesser Goldfinch, 9.5 (97, 39); House Wren, 8 (82, 33); Brown Towhee, 8; Hutton's Vireo, 6 (62, 25); Mourning Dove, 4.5 (46, 19); Plain Titmouse, 4 (41, 17); Yellow-breasted Chat, 4; Scrub Jay, 3.5 (36, 15); Com. Yellowthroat, 3.5, Nuttall's Woodpecker, 3 (31, 12); W. Wood-Pewee, 3; Ash-throated Flycatcher, 3; Yellow Warbler, 3; Black-chinned Hummingbird, 2.5; W. Flycatcher, 2; Cassin's Kingbird, 2; Swainson's Thrush, 2; Eur. Starling, 2, Bell's Vireo, 2; Brown-headed Cowbird, 2; N Oriole, 2; California Quail, 1.5; Acorn Woodpecker, 1.5; California Thrasher, 1.5; Cooper's Hawk, 1; Red-shouldered Hawk, 1; Red-tailed Hawk, 1; Am. Kestrel, 1; Com. Barn-Owl, 1; W. Screech-Owl, 1; Anna's Hummingbird, 1; Belted Kingfisher, 1; Downy Woodpecker, 1; N. Flicker, 1; Black Phoebe, 1; Phainopepla, 1; Lazuli Bunting, 1; Costa's Hummingbird, +; N. Rough-winged Swallow, +; Lark Sparrow, +; House Finch, +. **Total:** 48 species; 188.5 territorial males or females (1933/km², 782/100 acres). **Visitors:** Mallard, Turkey Vulture, White-throated Swift, Olive-sided Flycatcher, Hammond's Flycatcher, Cliff Swallow, Ruby-crowned Kinglet, Warbling Vireo, Nashville Warbler, Yellow-rumped Warbler, Black-throated Gray Warbler, Townsend's Warbler, Hermit Warbler, Wilson's Warbler, W. Tanager, White-crowned Sparrow. **Remarks:** Nests found (13): Mourning Dove, 2; Black-chinned Hummingbird, 2; W. Screech Owl, 1; Downy Woodpecker, 1; Cassin's Kingbird, 1; Plain Titmouse, 1; House Wren, 1; European Starling, 1; Bell's Vireo, 1; N. Oriole, 1; Lesser Goldfinch, 1. There were at least slight increases in the number of pairs detected during 1983 for 22 species, the numbers were down for 9 species, and remained the same for 7 species. Ten breeding species were newly detected on the plot, but 2 from 1982 were lost —DAVID BONTRAGER, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

131. RIVERINE WILLOW WOODLAND WITH SCATTERED COTTONWOODS. — **Location:** California, San Diego Co., along the Santa Margarita River about 1.5 mi N of Fallbrook and 0.25 mi upstream of the mouth of Sandia Creek, in the NW ¼ Section 7, continuing to Section 7 center, T9S, R3W, Temecula Quadrangle, USGS. **Continuity:** New (1982). **Size:** 12.7 ha = 31.4 acres (irregularly shaped, following the river bottom, but roughly 2750 × 500 ft, measured with tape and compass and planimetry of a 1982 color aerial photo, scale 1:6000). **Description of Plot:** A band that varied from 350 to 800 ft wide, of willow and

mixed woodlands (willows, Black Cottonwood; and California Sycamore) spans the river bottom, oriented roughly SE to NW. The water course width varied from 30 to 90 ft, with several small side channels. Flowing water was present throughout the entire period. A sparsely vegetated sandbar, measuring about 60 × 875 ft, abuted a vertical dirt bank that was up to 15 ft high within the plot, along the center of the NE boundary. Two small side creeks course into the plot, 1 from the S near the SE corner, and the other from the N near the center. General habitat types and vegetation were assessed along 756.9 m of transect. Low plant cover (below 6 ft) was analyzed by line intercept; number of tree stems and dbh for each were recorded over a 1513.8 m² (756.9 × 2 m) area; and canopy cover in woodland and habitats was assessed by sightings through an ocular tube with crosshairs at each meter of transect (1 reading on each side of tape), such that 202 readings were taken for a 100 m length of transect. The plot included approximately 56.3% mixed woodland, 16.0% tall willow woodland (greater than 5 m tall), 13.8% herbaceous to sub-shrubby riparian growth with scattered willows, 11.1% scour channel with some low cover, and 2.7% water channel, as determined by linear measurements along the transects. A total of 450 trees (1,204/acre) was encountered in the belt transects in 5 size classes (size class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.); Arroyo Willow, a-247, b-25, c-13, d-9, e-3; Pacific Willow, a-59, b-21, c-7, d-4, e-2; Hinds Willow, a-16; Black Cottonwood, a-27, b-2, c-4, d-6, e-1; Sycamore, c-1; and arborescent Tree Tobacco, a-3. A total of 32 standing snags was encountered: a-23, b-3, c-6. Average tree canopy cover and tree stem densities were 66.9% and 27 stems/100 m² (1093/acre) in tall willow woodland; 66.7% and 32.1/100 m² (1,300/acre) in mixed woodland; and 9.6% and 23/100 m² (931/acre) in riparian with scattered willows. Low ground cover was contributed by 45 plant species and totalled 54.9% over the entire plot. Factoring in overlap (more than 1 species covering the same piece of ground) where ground cover occurred yields a cover estimate of 105.1%. The 15 most abundant low ground cover plants contributed 90.2% of the total cover and the relative percentage of each (based upon 100% total) was: Wild Grape, 36.3%; Arroyo Willow, 18.7%; Giant Reed, 7.3%; California Mugwort, 4.5%; White Sweet Clover, 3.2%; Pacific Willow, 2.8%; Cocklebur, 2.7%; Hinds Willow, 2.6%; scouring-rushes, 2.6%; Black Cottonwood, 2.4%; Telegraph-weed, 1.8%; Douglas Mulefat, 1.4%; Poison Oak, 1.4%; Douglas Nightshade, 1.3%; and W. Blackberry, 1.2%. **Edge:** The riparian habitats continue along the river for miles upstream and down. The hills that border the river here are relatively steep and covered with dense chaparral, although Coast Live Oaks fringe and occur scattered within the shrublands near the boundaries. Paved road marks the downstream or NW edge (Sandia Creek Road) and runs along the downstream ¼ of the NE boundary. **Topography:** Relatively flat at 340 ft. Local relief was small and con-

tributed by the few feet difference between bars and channels and also by the vertical embankment along the NE boundary. **1982:** **Weather:** Slight overcast on 3 trips with light drizzle on 1; otherwise clear and sunny Temp. range, low 50s to high 70s (°F). **Coverage:** Apr. 24, 28; May 5, 14, 17, 21, 25, June 3; 0530-1100 hrs. Total obs.-hours 29.5. **Census:** Song Sparrow, 66 (519, 210), Yellow Warbler, 21 (165, 67); Rufous-sided Towhee, 9.5 (75, 30); Bewick's Wren, 8 (63, 25); Black-headed Grosbeak, 8; Wrentit, 7 (55, 22); Lesser Goldfinch, 7; Yellow-breasted Chat, 6 (47, 19); Bushtit, 5.5 (43, 18), Mourning Dove, 5 (39, 16); Black-chinned Hummingbird, 5; Swainson's Thrush, 5, Com. Yellowthroat, 5; Plain Titmouse, 4.5 (35, 14); Orange-crowned Warbler, 4.5; N Rough-winged Swallow, 4 (31, 13); Hutton's Vireo, 4; W. Wood-Pewee, 3.5 (28, 11), Brown-headed Cowbird, 3.5; Anna's Hummingbird, 3 (24, 10); Nuttall's Woodpecker, 3; Downy Woodpecker, 3; House Wren, 2, Bell's Vireo, 2; Red-shouldered Hawk, 1; N. Flicker, 1; W. Flycatcher, 1; Ash-throated Flycatcher, 1; Black Phoebe, 0.5; Mallard, +; California Quail, +; Killdeer, +; Costa's Hummingbird, +; Belted Kingfisher, +; Scrub Jay, +; Hooded Oriole, +; N. Oriole, +. **Total:** 37 species; 199.5 territorial males or females (1570/km², 635/100 acres). **Visitors:** Great Blue Heron; Vaux's Swift; White-throated Swift; Acorn Woodpecker; Olive-sided Flycatcher; Willow Flycatcher; Cliff Swallow; Barn Swallow; Am. Crow; California Thrasher; Warbling Vireo; Nashville Warbler; Yellow-rumped Warbler; Black-throated Gray Warbler; Townsend's Warbler; Hermit Warbler; Wilson's Warbler; W. Tanager; Brown Towhee; House Finch; Pine Siskin; Am. Goldfinch. **Remarks:** Nests found (12): Black-chinned Hummingbird (3), Lesser Goldfinch (3), Red-shouldered Hawk (1), Anna's Hummingbird (1), N. Flicker (1), Black Phoebe (1), House Wren (1), Yellow Warbler (1). —BRIAN E. DANIELS, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

132. TALL WILLOW WOODLAND.

— **Location:** California; San Diego Co., on Camp Pendleton at the confluence of the Santa Margarita River and Deluz Creek and downstream to a proposed dam site, spanning the river in the lower center of Section 29, T9S, R4W, Morro Hill Quadrangle, USGS. **Continuity:** New (1982). **Size:** 10.76 ha = 26.6 acres (irregularly shaped but roughly rectangular and 750 × 1550 ft, measured with tape and compass and checked by planimetry of 1982 color aerial photo, scale 1:6000). **Description of Plot:** Dense willows form a nearly unbroken canopy over much of the plot with stands of tall trees, several exceeding 50 ft high. There are abundant scour channels, many are shaded and without dense understory vegetation. The river course and associated sandbars run the length of the plot near the E boundary, varying from about 30-70 ft wide and oriented roughly N-S, as is the plot. Flowing water was present during the entire period. General habitat types and vegetation

were assessed along a total of 741.8 m of transect. Low plant cover (below 6 ft) was analyzed by the line intercept method along transect lines. The number of tree stems and dbh for each were measured in a 1483.6 m² (741.8 × 2) area. Canopy cover in woodland habitats was assessed by sightings through an ocular tube with crosshairs at each meter of transect (1 reading on each side of the transect tape), such that 202 sightings were taken for each 100 m of transect length. The plot was comprised of 77.4% tall willow woodland (greater than 5 m tall), 7.9% scour channel with some low plant growth, 6.9% short willow woodland (less than 5 m tall), 3.1% California Sycamore woodland, 0.7% disturbed riparian growth, and 3.9% river channel and flowing water. A total of 577 trees (1,575 per acre) was encountered in the belt transects. There were 5 species of willow present in 5 size classes (class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.): Arroyo Willow a-173, b-53, c-81, d-33, e-10; Goodding Willow a-9; Hinds Willow a-186, b-2; Pacific Willow a-2; and Red Willow a-14, b-1, c-5, d-3; also 2 sycamores, c-1, d-1; 3 arborescent Castorbean plants, a-1, b-2; and 16 snags a-11, b-4, c-1. Average tree canopy cover and tree stem densities were: 73.7% and 26.6/100 m² (1,077/acre) in tall willow woodland; 66.6% and 267/100 m² (10,810/acre) in short willow woodland; and 75% and 2.0/100 m² (81/acre) in sycamore woodland. Forty-eight species of vascular plants contributed 39.7% low ground cover. Including cover overlap (more than 1 species covering the same piece of ground) increases ground cover to 63.7%. The 12 most abundant ground cover plants contributed 89.8% of the total cover and the relative percent of each (based upon 100% total) was: scouring-rushes, 31%; Arroyo Willow, 13%; California Mugwort, 11.4%; W. Blackberry, 8.3%; Desert Grape, 6%; Hinds Willow, 5%; mulefat sprouts (*Baccharis* spp.), 4.4%; Douglas Nightshade, 2.7%; W. Stinging Nettle, 2.7%; Com. Cocklebur, 2.2%; umbrella-sedges, 1.7%; and Red Willow, 1.4%. The remaining 10.2% cover was contributed by 36 species. **Edge:** Bound-ed by the Santa Margarita River Road (dirt) along the S ½ of the E edge and by Camp Deluz road (dirt) along the remaining ½ of that edge. Beyond the roads on the E and also on the W are low hills with coastal sage scrub, intermittent grasslands, and stands of Coast Live Oaks. Riparian habitats on the plot are contiguous with similar habitat along the Santa Margarita River to the S and NE and with those along Deluz Creek to the N. **Topography:** The floodplain is relatively flat with but slight local relief from scour channels and the riverbed and a slope of a few feet from N to S. **Elevation:** 140 ft. **1982: Weather:** Overcast at the start of 6 visits with clearing by mid to late count on 4 and light drizzle on 1; otherwise, clear and sunny. Temp. about 55-80°F. **Coverage:** Apr. 14, 20, 26; May 7, 12, 19; June 2, 7; 0600-1130 hrs. Total obs.-hours: 34.2. **Census:** House Wren, 38 (353, 143); Song Sparrow, 36.5 (339, 137); Bewick's Wren, 11 (102, 41); Downy Woodpecker, 10.5 (98, 39); Anna's Hummingbird, 10 (93, 38); Yellow Warbler, 10, Black-headed Grosbeak, 9 (84, 34); Rufous-sided Towhee, 9; Nuttall's Woodpecker, 7 (65, 26); Bushtit, 6 (56, 23); Orange-crowned Warbler, 6; Brown-headed Cowbird, 5 (46, 19); W. Flycatcher, 4 (37, 15); Eur. Starling, 4; Hutton's Vireo, 4; Ash-throated Flycatcher, 3.5 (33, 13); Black-chinned Hummingbird, 3 (28, 11); Acorn Woodpecker, 3; Plain Titmouse, 3; Com. Yellowthroat, 3; Yellow-breasted Chat, 3; N. Flicker, 2; Red-shouldered Hawk, 1; Am. Kestrel, 1; Com. Barn-Owl, 1; Com. Raven, 1; Red-winged Blackbird, 1; Black-shouldered Kite, 0.5; Green-backed Heron, +; Cooper's Hawk, +; Black Phoebe, +; Scrub Jay, +; Swainson's Thrush, +; Wrentit, +; Brown Towhee, +; Lesser Goldfinch, +; Am. Goldfinch, +. **Total:** 37 species; 196 territorial males or females (1821/km², 737/100 acres). **Visitors:** (Numbers are the maximum observed on any count) Great Blue Heron, 1; Mallard, 2; Turkey Vulture, 2; Red-tailed Hawk, 2; W. Screech-Owl, 1; Belted Kingfisher, 1; Willow Flycatcher, 1; Am. Crow, 3; Ruby-crowned Kinglet, 5; Cedar Waxwing, 80; Warbling Vireo, 2; Nashville Warbler, 1; Yellow-rumped Warbler, 6; Black-throated Gray Warbler, 1; Townsend's Warbler, 3; Hermit Warbler, 1; Wilson's Warbler, 3; W. Tanager, 2; White-crowned Sparrow, 4; N. Oriole, 2. **Remarks:** Nests found (27): Red-shouldered Hawk (1), Am. Kestrel (1), Black-chinned Hummingbird (2), Anna's Hummingbird (1), Acorn Woodpecker (2), Nuttall's Woodpecker (2), Downy Woodpecker (4), N. Flicker (2), W. Flycatcher (2), Ash-throated Flycatcher (1), Com. Raven (1), Bewick's Wren (1), House Wren (1), Hutton's Vireo (1), Yellow Warbler (2), Song Sparrow (3). **1983: Weather:** Clear on 2 counts, overcast or foggy on 5, rain on 1. Overcast and fog typically cleared by end of count. Temperatures averaged 70°F, with a range of 60-75°. Winds were negligible on 6 counts, with the winds reaching 10 to 15 mph at mid-morning on 2. **Coverage:** Apr. 7, 12, 18, 28; May 5, 17, 24; June 16; 0700-1300 hrs. Total obs.-hours: 36.8. **Census:** House Wren, 49 (455, 184); Song Sparrow, 39 (362, 147); Bewick's Wren, 17 (158, 64); Rufous-sided Towhee, 14 (130, 53); Downy Woodpecker, 11 (102, 41); Black-chinned Hummingbird, 10.5 (98, 39); Bushtit, 10.5; Plain Titmouse, 10 (93, 38); Anna's Hummingbird, 9 (84, 34); Eur. Starling, 9; Hutton's Vireo, 9; Yellow Warbler, 8.5 (79, 32); Orange-crowned Warbler, 8 (74, 30); W. Flycatcher, 7.5 (70, 28); Black Grosbeak, 6 (56, 23); Nuttall's Woodpecker, 4.5 (42, 17); Com. Yellowthroat, 4.5; Ash-throated Flycatcher, 4 (37, 15); Acorn Woodpecker, 3 (28, 11); Brown-headed Cowbird, 3; N. Flicker, 2.5; Yellow-breasted Chat, 2; Hairy Woodpecker, 1.5; Red-shouldered Hawk, 1; Am. Kestrel, 1; Com. Barn-Owl, 1; Com. Raven, 1; Black-shouldered Kite, 0.5; Mourning Dove, 0.5; Great Horned Owl, 0.5; Black Phoebe, 0.5; Scrub Jay, 0.5; Belted Kingfisher, +; W. Wood-Pewee, +; Am. Goldfinch, +; Lesser Goldfinch, +. **Total:** 36 species; 249.5 territorial males (2317/km², 938/100 ac). **Visitors:** (Numbers are maximum observed on

any one visit) Turkey Vulture, 3, Cooper's Hawk, 1; Mallard, 2; White-throated Swift, 3; Rough-winged Swallow, 11; Am. Crow, 2; Wrentit, 1; Am. Robin, 1; California Thrasher, 1; Warbling Vireo, 4; Wilson's Warbler, 2; N. Oriole, 1; House Finch, 6. **Remarks:** Nests found (35): Red-shouldered Hawk (1), Am. Kestrel (1), Com. Barn-Owl (1), Anna's Hummingbird (3), Nuttall's Woodpecker (2), Downy Woodpecker (3), Hairy Woodpecker (1), N. Flicker (1), W. Flycatcher (5), Com. Raven (1), Plain Titmouse (1), House Wren (12), Eur. Starling (3). Species which bred in 1982 failed to do so in 1983: Green-backed Heron, Cooper's Hawk, Swainson's Thrush, Brown Towhee, Red-winged Blackbird. Four new species bred on the plot in 1983 that were not recorded in 1982: Mourning Dove, Great Horned Owl, Hairy Woodpecker and W. Wood-Pewee. Hairy Woodpeckers may have bred adjacent to the plot in 1982, but were not detected until after the 1982 census. Nearly all species increased in number of breeding individuals from 1982 to 1983, or remained at approximately the same levels.—THOMAS A. SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677

133. WILLOW WOODLAND WITH DENSE RIPARIAN UNDERSTORY. —

Location: California; San Diego Co., on Camp Pendleton along the W side of the floodplain of the Santa Margarita River N of the Isadora Cliffs and Basin. The N plot boundary was about 1100 yds S of a large Base Rifle Range; located in the NW ¼ Section 26, T10S, R5W, Las Pulgas Quad, USGS. **Continuity:** New (1982). **Size:** 12 ha = 29.6 acres (approximately square in shape, about 1000 × 1300 ft, measured with tape and compass and trued by planimetry of 1982 color aerial photo, scale 1:6,000). **Description of Plot:** A broad belt of willow woodland and associated riparian growth, oriented roughly N-S along the W edge of the floodplain which here measures about 3000 ft wide. The plot was located W of the river course and contained no flowing water although some standing water was present during the early spring as a result of heavy seasonal rainfall and runoff. General habitat types and vegetation were assessed along 771 m of transect. Low plant cover (below 6 ft) was analyzed using the line intercept method along the transects. Number of tree stems and dbh for each were recorded over a 1542 m² (771 m × 2) area. Canopy cover in woodland habitats was assessed by sighting through an ocular tube with crosshairs at each meter of transect (1 reading on each side of the transect tape) such that 202 readings were taken for every 100 m of transect length. The plot was comprised of 43.2% herbaceous to sub-shrubby riparian vegetation with scattered willows, 30.1% short willow woodland (less than 5 m tall), 21.9% tall willow woodland (5 m), and 4.8% additional low riparian growth. A total of 1,174 trees (3,082/acre) was encountered. There were 3 species of willow present in 4 size categories (class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.): Arroyo Willow a-274; b-50, c-21, d-1; Goodding Willow a-

409, b-44, c-9; Hinds Willow a-211, b-1; Salt-cedar (*Tamarix* sp.) in 3 size classes: a-129, b-17, c-7; a single arborescent Tree Tobacco: a-1; and a total of 6 snags: a-6. Average tree canopy cover and tree stem densities were (numbers are % cover, stems/m² (stems/acre), respectively): 62.5% and 106/100 m² (4291/acre) in tall willow woodland; 62.4 and 132 (5,344) in short willow woodland; and 15.8 and 31.7 (1283) in riparian habitat with scattered willows. Fifty-six species of plants contributed low ground cover of 69% over the plot. Adding in 3-dimensional overlap (more than one species covered the same area of ground), low ground cover increases to 114.2%. The 18 most abundant plants contributed 83.3% of the cover and the relative percentage (based on 100% total) of each was: mulefat, 11.7%; Bermuda Grass (*Cynodon dactylon*), 10.3%; Douglas Mulefat, 7.2%; Arroyo Willow, 7.1%; spike-rush, 6.8%; Giant Reed, 6.7%; California Mugwort, 6.5%; Goodding Willow, 3.6%; umbrella-sedge, 3.6%; Tamarisk, 3.5%; Yerba Mansa, 3%; Prairie Bulrush (*Scirpus robustus*), 3%; Black Mustard, 2.1%; English Rye Grass (*Lolium perenne*), 1.8%; Bristly Ox Tongue, 1.8%; Mulefat sprouts, 1.7%; Sweet Fennel, 1.5%; and Rabbit's Foot Grass (*Polypogon monspeliensis*), 1.4%. **Edge:** Bounded by the Santa Margarita River on the E and water-well access roads (dirt) on the N and W. The riparian habitat continues on the other side of the river to the W and for miles along the river to the N and S. Low hills with coastal sage scrub and patches of open grassland abut the road on the W. **Topography:** Relatively flat at about 40 ft elevation. **1982 Weather:** Overcast on 7 trips with clearing to sunny by count's end on 2 and intermittent light drizzle to rain on 2 others; entirely clear on 1 visit. Temp. about 55-76°F. **Coverage:** Apr. 12, 14, 26; May 1, 11, 15, 24; June 4; 0600-0945 hrs. Total obs.-hours: 24. **Census:** Song Sparrow, 69 (576, 233); Com. Yellowthroat, 30 (250, 101); Am. Goldfinch, 12 (100, 41); Red-winged Blackbird, 11 (92, 37); Mourning Dove, 9 (75, 30); Rufous-sided Towhee, 8 (67, 27); Yellow-breasted Chat, 6.5 (54, 22); Bushtit, 4 (33, 14); Yellow Warbler, 4; Brown-headed Cowbird, 4; Anna's Hummingbird, 3 (25, 10); Bewick's Wren, 3; Bell's Vireo, 3; Downy Woodpecker, 2; Wrentit, 2; Orange-crowned Warbler, 2; N. Oriole, 2; Hutton's Vireo, 1.5; Brown Towhee, 1.5; Black-shouldered Kite, 1; N. Harrier, 1; California Quail, 1; Virginia Rail, 1; Am. Coot, 1; Black-chinned Hummingbird, 1; Costa's Hummingbird, 1; Willow Flycatcher, 1; Black Phoebe, 1; Black-headed Grosbeak, 1; Swainson's Thrush, 0.5; Pied-billed Grebe, +; Green-backed Heron, +; Mallard, +; Cinnamon Teal, +; Blue Grosbeak, +; Hooded Oriole, +; Lesser Goldfinch, +. **Total:** 37 species; 188 territorial males or females (1569/km², 635/100 acres). **Visitors:** White-faced Ibis; Red-shouldered Hawk; Sora; Com. Moorhen; Com. Barn-Owl; W. Flycatcher; Ash-throated Flycatcher; Cassin's Kingbird; Cliff Swallow; Am. Crow; Com. Raven; California Thrasher; Warbling Vireo; Nashville Warbler; Yellow-rumped Warbler; Black-throated Gray War-

bler; Townsend's Warbler; Hermit Warbler; Wilson's Warbler; W. Tanager. **Remarks:** Nests found (8): Am. Goldfinch (3), Bell's Vireo (2), Black-shouldered Kite (1), N. Harrier (1), Mourning Dove (1). **1983 Weather:** Overcast on 3 trips with intermittent light drizzle on 1; fog on 2, burning off by counts end, and clear and warm on 3. Temp. range, about 60-82°F. **Coverage:** May 3-5, 11-12, 16-18; 0645-1015 hrs. Total obs.-hours: 18.5. **Census:** Song Sparrow, 81 (676, 274); Com. Yellowthroat, 27 (225, 91); Am. Goldfinch, 9 (75, 30); Rufous-sided Towhee, 8.5 (71, 29); Red-winged Blackbird, 8 (67, 27); Yellow-breasted Chat, 7.5 (63, 25); Brown-headed Cowbird, 5 (42, 17); Wrentit, 4.5 (38, 15); Bushtit, 4 (33, 14); Mourning Dove, 3.5 (29, 12); Anna's Hummingbird, 3.5; Bewick's Wren, 3.5; Costa's Hummingbird, 3 (25, 10); Downy Woodpecker, 2; Yellow Warbler, 2; Black-headed Grosbeak, 2; Am. Coot, 1.5; Black-chinned Hummingbird, 1.5; Black-shouldered Kite, 1; Com. Moorhen, 1; Willow Flycatcher, 1; Hutton's Vireo, 1; N. Oriole, 1; Lesser Goldfinch, 1; California Quail, 0.5; Black Phoebe, 0.5; Brown Towhee, 0.5; Green-backed Heron, +; Mallard, +; Cinnamon Teal, +; Virginia Rail, +; Nuttall's Woodpecker, +; Swainson's Thrush, +; Orange-crowned Warbler, +; Blue Grosbeak, +; House Finch, +. **Total:** 36 species; 184.5 territorial males or females (1540/km², 623/100 acres). **Visitors:** White-faced Ibis, Red-shouldered Hawk, Killdeer, Greater Roadrunner, Hairy Woodpecker, N. Flicker, W. Flycatcher, Ash-throated Flycatcher, Cliff Swallow, Barn Swallow, Scrub Jay, Am. Crow, Com. Raven, House Wren, Eur. Starling, Warbling Vireo, Black-throated Gray Warbler, Townsend's Warbler, Wilson's Warbler. **Remarks:** Nests found (3): Anna's Hummingbird (1), Black Phoebe (1), Am. Goldfinch (1). The plot this spring, relative to last year's census period, had considerably less water. There were at least slight increases in the number of pairs detected for 11 species, the numbers were down for 14, and remained the same for 8; 3 breeding species were newly detected but 4 from 1982 were lost.—*BRIAN E. DANIELS and RICHARD L. ZEMBAL, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.*

134. DOUGLAS-FIR-PONDEROSA PINE FOREST. — **Location:** Colorado: El Paso Co., 0.7 mi E of University of Colorado campus, Colorado Springs, 1000 ft N of the end of Flintridge Drive, 38°53'N, 104°47'W, Pikeview Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 7.53 ha = 18.6 acres. **Description of Plot:** See AB 37:87 (1983). **Weather:** Seasonal events in spring and summer this year were later than usual. Both June and July had higher than average precipitation but August was normal. **Coverage:** May 21; June 11-12, 18-19, 25; July 2, 4, 9-10, 16; 0630-0820 hours, MDT. Total obs.-hours: 18. **Census:** Rufous-sided Towhee, 8 (106, 43); Black-billed Magpie, 6 (80, 32); Am. Robin, 4 (53, 22); Black-capped Chickadee, 3 (40, 16); Virginia's Warbler, 2.5; White-

breasted Nuthatch, 2; Mourning Dove, 1; N. Flicker, 1; Scrub Jay, 1; Brown-headed Cowbird, 1 (♀); N. Oriole, 1; Black-headed Grosbeak, 0.5; Brewer's Blackbird, 0.5; Downy Woodpecker, +; Am. Crow, +; Eur. Starling, +; Chipping Sparrow, +. **Total:** 17 species; 31.5 territorial males or females (418/km², 169/100 acres). **Visitors:** Mallard, Killdeer, Chimney Swift, Broad-tailed Hummingbird, W. Meadowlark, Yellow-rumped Warbler, Dark-eyed Junco, Red Crossbill. **Remarks:** Total number of breeding species (17) was up by 5 over last year (12), but the total number of breeding pairs declined from 41 to 31.5.—*DON VAN HORN, Dept. of Biol., Univ. of Colo., Colorado Springs, CO 80907.*

135. PONDEROSA PINE FOREST. —

Location: Colorado, Boulder Co., Boulder, in the lower foothills, 0.5 mi S of Baseline Road, E part of Sect. 1, T1S, R71W, 6th Principal Meridian. **Continuity:** Established 1954; 15 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 8:372 (1954). **Weather:** A cold, wet, late spring. **Coverage:** Mar. 13; Apr. 2, 17, 24; May 1, 8, 14, 22, 29; June 5, 12, 29; July 3, 10, 24, 31; Aug. 7, 21, 28; Sept. 1; 0717-1302. Total obs.-hours: 20.5. **Census:** Am. Robin, 5 (62,



BBC 135, Boulder, Boulder Co., Colo. Ponderosa Pine Forest from NE corner looking W. Photo/L. Hering.

25); W. Wood-Pewee, 3 (37, 15); Pygmy Nuthatch, 3; Gray-headed Junco, 3; Broad-tailed Hummingbird, 2; Mountain Chickadee, 2; Chipping Sparrow, 2; Pine Siskin, 2; N. Flicker, 1; Black-billed Magpie, 1; White-breasted Nuthatch, 1; Solitary Vireo, 1; W. Tanager, 1; Lesser Goldfinch, 1. **Total:** 14 species; 28 territorial males or females (346/km², 140/100 acres). **Remarks:** This population was the lowest in several years. Extensive cutting in 1982 thinned the forest dramatically. The spring was one of the wettest on record.—*LOUISE HERING, 568 Marine Street, Boulder, CO 80302.*

136. MONTANE OPEN DOUGLAS-FIR FOREST. —

Location: British Columbia; Kootenay Land District; 8 km (5 mi) SE of Radium Hot Springs; 50°34'N, 116°2'W; Canadian Nat'l Topographic System, Map Sheet 82K/9. **Continuity:** New. **Size:** 18 ha = 44.5 acres (rectangle, tape-measured, 450 × 400 m). **Description of Plot:** Douglas-fir forms an open and discontinuous canopy cover interspersed with grassland communities dominated by June Grass (*Koeleria cristata*), N. Wheat Grass (*Agropyron dasystachyum*),

and Richardson Needle Grass (*Stipa richardsonii*). Other tree species showing a clumped distribution include Lodgepole Pine, and Quaking Aspen. The sparse shrub layer includes Rocky Mountain Juniper, Com. Juniper, Rabbitbrush, Soapberry (*Shepherdia canadensis*), and W. Serviceberry. Ground cover is variable. Under Douglas-fir open forest major species include Prickly Rose, White Meadowsweet, Snowberry, Bearberry, N. Wheat Grass, Pine Grass (*Calamagrostis rubescens*), N. Bedstraw, Prairie-Crocus and Balsamroot. Grassland communities are of 2 types with intergrades based on slope and elevation: low elevation, gently sloping areas contain an association of June Grass, blue grass (*Poa* sp.), Pasture Sagewort, Wild Blue Flax and Gaillardia; higher elevation, steeper slopes are dominated by Richardson Needle Grass, June Grass, and an everlasting (*Antennaria nitida*). A quantitative survey of the vegetation gave: Trees 3-in. diameter and over, based on 30 random 50×2 m transects, 102/acre; total basal area, 114.2 ft²/acre. Species comprising 93% of the total tree cover [figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence]: Douglas-fir, 82, 80, 90, 70; Lodgepole Pine, 15, 14, 8, 16; Quaking Aspen, 3, 3, 1, 7. Trees by diameter class [figures after each class give number of trees/acre, relative density (%), basal area (ft²/acre), relative dominance (%)]: A (3-6 in.) 48, 47, 11.9, 11; B (6-9 in.) 21, 21, 15.9, 14; C (9-15 in.) 23, 22, 44.8, 39; D (15-21 in.) 9, 9, 41.4, 36. Shrub stems/acre, 327; ground cover, 62%; canopy cover, 32%; canopy height, 41 ft (range 35-55). There is a 20 ft wide access road traversing the grassland along the S edge and an abandoned 10 ft wide road running SE-NW through the open Douglas-fir forest. Neither road creates a significant break in vegetation cover. **Edge:** Bounded on the E and W by similar open forest; on the N by a steep grassy coluvial slope; and on the S by a grassland complex with tree islands. **Topography:** Flat to steeply sloping, hummocky, ridged glacial terrace at 3000-3100 ft, 300 ft above the Columbia River valley bottom. Several dry channels dissect the area. Soil is a well drained complex of Orthic Regosol, Orthic Humic Regosol and Rego Dark Brown. **Weather:** Temp. 38-45°F at dawn. Clear or partly cloudy skies all days with winds 5-10 mph. **Coverage:** June 6, 10, 13, 15, 17, 22; 0515-0830 hrs, MDT. Total obs.-hours: 15.5. **Census:** Dark-eyed Junco, 10.5 (58, 24); Chipping Sparrow, 6.5 (36, 15); Dusky Flycatcher, 4.5 (25, 10); Yellow-rumped Warbler, 2.5; W. Tanager, 2.5; Vesper Sparrow, 2.5; Ruby-crowned Kinglet, 2; Solitary Vireo, 2; Brown-headed Cowbird, 2; Mountain Chickadee, 1; Golden-crowned Kinglet, 1; Am. Robin, 1; Evening Grosbeak, 1; Black-capped Chickadee, 0.5; Cooper's Hawk, +; Com. Nighthawk, +; Townsend's Warbler, +; Cassin's Finch, +. **Total:** 18 species; 39.5 territorial males (219/km², 89/100 acres). **Visitors:** Blue Grouse, N. Raven, Am. Crow, Pine Siskin, Red Crossbill. **Remarks:** The plot, and a significant portion of winter range for Rocky Mountain Bighorn

Sheep, is adjacent Kootenay Nat'l Park and is currently being negotiated for inclusion within the Park.—DAVID M. POLL, and JOEP VAN DE VLASAKKER, Canadian Wildlife Service, #1000-9942-108 Street, Edmonton, Alberta, T5K 2J5.



BBC 137, Gifford Pinchot Nat'l Forest, Clark Co., Wash. Lodgepole Pine-Mixed Coniferous Forest. Photo/D. Anderson.

137. LODGEPOLE PINE-MIXED CONIFEROUS FOREST. — **Location:** Washington; Clark Co., Gifford Pinchot Nat'l Forest, 4.5 mi SW of Mt. St. Helens; NE $\frac{1}{4}$ Sec 26 T8N R4E; 46°09'N, 122°16'W, Cougar Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 9.29 ha = 22.96 acres. **Description of Plot:** See AB 37:88-89 (1983). **Weather:** Morning temp. range, 39-45°F. Sky conditions generally were mostly cloudy. Estimated wind speeds, 0-5 mph. Snow, covering about 10% of the ground on the May 14 visit, melted soon after the May 21 visit—about 1 month earlier than last year. **Coverage:** May 14, 21; June 5, 7, 9, 26; 0530-0900 hrs. Total obs.-hours: 8.5. **Census:** Dark-eyed Junco, 10 (108, 44); Hermit Warbler, 4.5 (48, 20); Varied Thrush, 3.5 (38, 15); Red-breasted Nuthatch, 2.5; Golden-crowned Kinglet, 2.5; N. Flicker, 2; Chestnut-backed Chickadee, 2; Hermit Thrush, 2; W. Tanager, 2; Yellow-rumped Warbler, 1.5; Rufous-sided Towhee, 1.5; Hammond's Flycatcher, +; W. Flycatcher, +. **Total:** 13 species; 34 territorial males (366/km², 148/100 acres). **Visitors:** Com. Nighthawk, Vaux's Swift, Rufous Hummingbird, Tree Swallow, Brown Creeper, Am. Robin, Nashville Warbler, Red Crossbill, Pine Siskin, Evening Grosbeak. **Remarks:** Nests found: Hermit Thrush (1), Dark-eyed Junco (2). Evidence of Pileated Woodpecker visits was noted but none was encountered. Territories for both Red-breasted Nuthatch and Chestnut-backed Chickadees were again poorly defined. Most chickadees were encountered in the northern portion while most nuthatches were generally encountered in the E central portion. Increases were noted in N. Flicker, Chestnut-backed Chickadee, Red-breasted Nuthatch, Golden-crowned

Kinglet, Varied Thrush and Dark-eyed Junco. Hermit Thrushes declined. Red Crossbills, Pine Siskin and Evening Grosbeak were common visitors early in the period, but declined toward the end of the census. Even though minor steam and ash emissions from Mt. St. Helens continue to be common occurrences no noticeable ash fall was noted during the census period.—DAVID A. ANDERSON, 2703 SE Belmont, Portland, OR 97214.

138. BURNED PINE-FIR FOREST. —

Location: California; Sierra and Nevada Co., Sagehen Creek Field Station permanent grid plots, 6.5 km NW of Hobart Mills; 39°26'N, 120°14'W, Truckee Quadrangle, USGS. **Continuity:** Established 1966; 3 consecutive years. **Size:** 8.46 ha = 20.9 acres. **Description of Plot:** See AB 36:88 (1982). **Elevation:** 6450-6575 ft. **Weather:** Average temp. was 50°F (30-79°); slight breezes with very occasional gusts to 10-15 mph were encountered with infrequent cloud cover to 70%. **Coverage:** June 8, 12, 16, 20, 23, 27, 30; July 5, 7, 11, 13-14; started 0440-0545, PST. Total obs.-hours: 43.5. **Census:** Fox Sparrow, 6.5 (77, 31); *Empidonax* sp. (probably *oberholseri*), 3.5 (41, 17); Yellow Warbler, 3.5; Mountain Chickadee, 3 (35, 14); Dark-eyed Junco, 3; Green-tailed Towhee, 2.5; Calliope Hummingbird, 1.5; Mountain Bluebird, 1; Am. Robin, 1; Brown-headed Cowbird, 1; Cassin's Finch, 1; Olive-sided Flycatcher, 0.5; Yellow-rumped Warbler, 0.5; Am. Kestrel, +; Mountain Quail, +; Com. Nighthawk, +; Williamson's Sapsucker, +; Hairy Woodpecker, +; N. Flicker, +; Nashville Warbler, +; W. Tanager, +; Chipping Sparrow, +; Red Crossbill, +; Pine Siskin, +; Evening Grosbeak, +. **Total:** 25 species; 28.5 territorial males (337/km², 136/100 acres). **Visitors:** Com. Merganser, Turkey Vulture, Golden Eagle, Vaux's Swift, White-headed Woodpecker, W. Wood-Pewee, Steller's Jay, White-breasted Nuthatch, Townsend's Solitaire, Lazuli Bunting. **Remarks:** Nests found (12): Williamson's Sapsucker (1), *Empidonax* sp. (1), Mountain Chickadee (3), Mountain Bluebird (1), Yellow Warbler (2), Yellow-rumped Warbler (1), Fox Sparrow (1), Darkeyed Junco (1), Cassin's Finch (1). Timing of onset of breeding season was considerably delayed due to extreme snowfall for the year. Non-migratory populations appear to be somewhat depressed especially for woodpeckers. A slight increasing trend for number of territorial males was observed over the past 3 years. We thank W. Wagner, A. Engilis, V. Landrum, T. deBruin, and J. Vandeurzen for field assistance.—MICHAEL P. YODER-WILLIAMS and KIMBERLY WITH, Sagehen Creek Field Station, Univ. of Calif., Truckee, CA 95734.

139. MATURE PINE-FIR FOREST. —

Location: California; Nevada Co., Sagehen Creek Field Station permanent grid plots, 6.5 km NW of Hobart Mills; 39°26'N, 120°14'W, Truckee Quadrangle, USGS. **Continuity:** Established 1966; 3 consecutive years. **Size:** 8.46 ha = 20.9 acres. **Description of Plot:**

See AB 36:88-89 (1982). **Elevation:** 6600-6750 ft. **Weather:** Average temperature was 50°F (34-74°); slight breezes were infrequent and the sky was clear with rare 95-100% cloud cover. **Coverage:** June 9, 14, 19, 22, 27, 30; July 3, 8, 11, 13, 15, 26; 0440-0520, PST. Total obs.-hours: 44. **Census:** Golden-crowned Kinglet, 3.5 (41, 17); Yellow-rumped Warbler, 3 (35, 14); Dark-eyed Junco, 3, *Empidonax* sp. (probably *oberholseri*), 2 5, Mountain Chickadee, 2.5; Red-breasted Nuthatch, 2; Hermit Thrush, 2; W. Tanager, 2, Brown Creeper, 1.5; Townsend's Solitaire, 1 5, N. Flicker, 1; Steller's Jay, 1; Am. Robin, 1, Evening Grosbeak, 1; Pine Siskin, 0.5; Calliope Hummingbird, +; Hairy Woodpecker, +; Red Crossbill, +. **Total:** 18 species; 28 territorial males ($331/\text{km}^2$, 134/100 acres). **Visitors:** Com. Merganser, N. Goshawk, Vaux's Swift, Williamson's Sapsucker, White-headed Woodpecker, Pileated Woodpecker, White-breasted Nuthatch, Warbling Vireo, Nashville Warbler, Yellow Warbler, Black-headed Grosbeak, Cassin's Finch. **Remarks:** Nests found (7): Brown Creeper (2), Mountain Chickadee (1), Townsend's Solitaire (2), W. Tanager (1), Dark-eyed Junco (1) A Steller's Jay was observed with a hatching in its beak pursued by a male and female Yellow-rumped Warbler. A slight increase in total number of territorial males was observed over the past 3 years. We thank V. Landrum, B. Wagner, M. Morrison, J. Vandeurzen, and T. deBruin for field assistance.—MICHAEL P. YODER-WILLIAMS and KIMBERLY WITH, Sagehen Creek Field Station, Univ. of Calif., Truckee, CA 95734.

140. MIXED CONIFER FOREST. — **Location:** California; San Diego Co., Cuyamaca Rancho State Park, 1.65 km W (255°) of intersection of St. Hwy. 79 and entrance of Paso Picacho Campground; 32°58'N, 116°36'W, Cuyamaca Peak Quadrangle, USGS. **Continuity:** New. **Size:** 9.0 ha = 22.2 acres, (300×300 m, measured with meter tape using compass bearings). **Description of Plot:** A dense, mature mixed coniferous-oak forest. Total vegetative cover exceeds 100% (400.5%) and horizontal visibility is generally less than 25 m. Dominant tree species include White Fir (48%), Incense Cedar (29%), California Black Oak (15%), with Canyon Live Oak (5%), Jeffrey Pine (3%) and Sugar Pine (1%) in minor amounts. The shrub layer generally exceeds 100% total cover. Dominant species include Palmer's Ceanothus, Snowberry, and White Fir saplings. The herbaceous layer consists of Bracken, brome grasses, Am. Vetch, and California Goldenrod. Vegetative cover was determined using three 2×50 m belt transects for shrubs and herbs (in subplots) and three 10×10 m plots for trees. **Edge:** Surrounded by similar vegetation on all sides. **Topography:** Slope is 8-15% and E facing. **Elevation:** 1646 m (5400 ft) **Weather:** Clear and cool, no precipitation. **Coverage:** Apr. 23, 28-30; May 21-22, 28, June 18; between 0530-0930. Total obs.-hours: 42.3. **Census:** Mountain Chickadee, 10 (111, 45); Dark-eyed Junco, 7 (78, 32); House Wren, 6 (67, 27); Rufous-sided Towhee, 5 (56, 23); Ash-throated Flycatcher, 3 (33, 14); Steller's Jay, 3; Fox Sparrow, 3; Band-tailed Pigeon, 2; White-headed Woodpecker, 2; N. Flicker, 2; Brown Creeper, 2; W. Bluebird, 2; Black-headed Grosbeak, 2; Mountain Quail, 1; Mourning Dove, 1; Anna's Hummingbird, 1; Acorn Woodpecker, 1; W. Wood-Pewee, 1; W. Flycatcher, 1; White-breasted Nuthatch, 1; Am. Robin, 1; W. Tanager, 1; Purple Finch, 1; Lesser Goldfinch, 1; Orange-crowned Warbler, 0.5. **Total:** 25 species; 60.5 territorial males ($673/\text{km}^2$, 273/100 acres). **Visitors:** Red-tailed Hawk, Red-shouldered Hawk, Great Horned Owl, Hairy Woodpecker, Violet-green Swallow, N. Raven, Olive-sided Flycatcher, Red-breasted Nuthatch, Pygmy Nuthatch, Eur. Starling, Brown-headed Cowbird. This work was supported by the California Department of Parks and Recreation. Thanks to Steve Boyd, Laura Frank, Nancy Gilbert, Dave Hawks, Jeri Hirschberg, Doug Hogan, Karla Kramer, Larry La Pre and Harold Wier for their assistance with the vegetation sampling.—ERIC N. WIER, 418 Tyrone Street, El Cajon, CA 92020.

141. PONDEROSA-PINE-SCRUBOAK-MOUNTAIN MAHOGANY WOODLAND. — **Location:** Colorado; Douglas Co., 1 mi E of Franktown, on Highway #86; 39°20'N, 104°40'W, Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 16 consecutive years. **Size:** 8.09 ha = 20 acres. **Weather:** Very cool and wet. **Coverage:** 8 trips in June and July; from 0800-2000 hours. Total obs.-hours: 56. **Census:** Bluebird, 9 (111, 45); Broad-tailed Hummingbird, 3 (37, 15); White-breasted Nuthatch, 3; House Finch, 3; Chipping Sparrow, 2; Lesser Goldfinch, 2; Hairy Woodpecker, 1; Black-capped Chickadee, 1; Black-headed Grosbeak, 1; Rufous-sided Towhee, 1. **Total:** 10 species; 26 territorial males ($321/\text{km}^2$, 130/100 acres). **Visitors:** Cooper's Hawk, Mourning Dove, N. Flicker, W. Wood-Pewee, Steller's Jay, Scrub Jay, Am. Crow, Am. Robin, Solitary Vireo, Gray-headed Junco, Pine Siskin. **Remarks:** Birds were up to 2 weeks late and then many nests were abandoned.—MILDRED O. SNYDER, 161 Del Mar Circle, Aurora, CO 80011.

142. DECIDUOUS-CONIFEROUS NORTH SLOPE. — **Location:** Utah; Washington Co., Zion Nat'l Park, S side of Heaps' Canyon; 37°15'30"N, 112°57'30"W; Topographic Map, Zion Nat'l Park, Utah; Zion Natural History Ass'n, Zion Nat'l Park, Springdale. **Size:** 20.23 ha = 50 acres. **Continuity:** Established 1982. **Description of Plot:** See AB 37:90 (1983). **Weather:** Temp. 3-5°F below normal; good rains on May 11 and July 6; dry between. **Coverage:** May 7, 13, 21, 27; June 3, 11, 17, 25; July 1, 9, 16; 0610-1145, MDT. Total obs.-hours: 45.8. **Census:** Rufous-sided Towhee, 8 (40, 16); Virginia's Warbler, 7 (35, 14); Solitary Vireo, 6 (30, 12); Black-headed Grosbeak, 6; Lazuli Bunting, 6; Warbling Vireo, 5 (25, 10); Black-throated Gray Warbler, 5; Broad-tailed Hummingbird, 3 (15, 6); Violet-green Swallow, 2; Am. Robin, 2; Mourning Dove, 1; Com. Flicker, 1; W. Wood-Pewee, 1; W. Flycatcher, 1; Ash-throated Flycatcher, 1; Scrub Jay, 1; N. Raven, 1; Hermit Thrush, 1; W. Tanager, 1; Belted Kingfisher, 0.5; Gray Vireo, 0.5. **Total:** 21 species; 60 male and female hummingbirds ($297/\text{km}^2$, 120/100 acres). **Visitors:** Cooper's Hawk, Spotted Sandpiper, Dusky Flycatcher, Black-capped Chickadee, Ruby-crowned Kinglet, Yellow Warbler. **Remarks:** Cooper's Hawk, which nested last year, was only seen once. Pygmy Owl, also present last year, was heard twice off the plot. Hermit Thrush, new this year, was not found until June 17. Two pairs of Violet-green Swallows nested in crevices in the cliff; others nested in the main canyon to the S, but fed over the plot, with an average of 12 seen per trip.—JEROME L. GIFFORD, P.O. Box 85, Springdale, UT 84767.

143. 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 the bridge at Stewart F.S. camp upstream to Sunny Flat F.S. camp; 31°54'N, 109°10'W, Portal Quadrangle, USGS. **Continuity:** Established 1978; 5 intermittent years. **Size:** 9.11 ha = 22.5 acres. **Description of Plot:** See AB 33:84-85 (1979). **Weather:** Normal, dry and hot, May-June; 6 showers in July. Water ran in the creek all summer, the first time in 5 years. **Coverage:** May 8-Aug. 7; 0600-0930, MST. Total obs.-hours: 90. **Census:** Black-chinned Hummingbird, 15 (165, 67); W. Wood-Pewee, 13 (143, 58); Rufous-sided Towhee, 13; Bridled Titmouse, 12 (132, 53); White-breasted Nuthatch, 10 (110, 44); Acorn Woodpecker, 9 (99, 40); Black-throated Gray Warbler, 8 (88, 36); Dusky-capped Flycatcher, 7 (77, 31); Brown-crested Flycatcher, 6 (66, 27); Bewick's Wren, 6; Solitary Vireo, 6; Hutton's Vireo, 6; Virginia's Warbler, 6; Lucy's Warbler, 6; Am. Robin, 5 (55, 22); Strickland's Woodpecker, 4.5 (49, 20); Black-headed Grosbeak, 4 (44, 18); Blue-throated Hummingbird, 3 (33, 13); N. Flicker, 3; Hepatic Tanager, 3; Yellow-eyed Junco, 3; Canyon Wren, 2.5; Elegant Trogon, 2; Sulphur-bellied Flycatcher, 2; Brown Creeper, 2; Rufous-crowned Sparrow, 2; Scott's Oriole, 2; Mourning Dove, 1; Magnificent Hummingbird, 1; Black Phoebe, 1; Gray-breasted Jay, 1; Bushtit, 1; Hermit Thrush, 1; Cassin's Kingbird, +. **Total:** 34 species; 167 territorial ♂ or ♀ hummingbirds ($1834/\text{km}^2$, 742/100 acres). **Visitors/aerial foragers:** Turkey Vulture, Band-tailed Pigeon, White-throated Swift, Violet-green Swallow, raven sp. (probably N.), W. Tanager, Lesser Goldfinch. Band-tailed Pigeons flew in to the creek when water sources in other areas dried up before the rains. Lesser Goldfinches were singing on territory as late as June 22, but were not established as breeding with any certainty. **Remarks:** Nests found (25): 11 species. Territories of 2 flocks of Gray-breasted Jays each with 7-10 birds extended into the plot, but it was

not determined if there was more than 1 breeding pair in either flock. Brown-headed Cowbirds were registered on 10 of 13 trips, but the breeding of these non-territorial birds is not known. This year showed a decrease from 1982 in the number of territorial ♂ (208 in 1982) and in the number of species. However, the population density was close to average for the 5-year period (167) indicating that the density for 1982 was perhaps unusually high. Areas of riparian habitat offering water, food and nesting sites are not available in all canyons of the mountains of southern Arizona. Changes in total species density from year to year may be attributed in part to the weather and its effects upon food availability. The relatively mild, dry winter and spring of 1982 resulted in a scarcity of flowering plants and/or insects. Satisfactory breeding sites may have been restricted to the banks of such streams as Cave Creek, resulting in a concentration of nesting birds. In 1983 during the winter and spring there was more precipitation than average resulting in widespread abundance of blooming plants, not only in the canyon but in adjacent areas. April was cold and a snowstorm on the 15th killed leaf buds of sycamores and cottonwoods. By May 7, these trees had just started a second growth to replace frozen leaves. Possibly some migrating species arriving in April found nesting sites elsewhere. The nesting pair of Cooper's Hawk did not return to the usual site. Also absent were Warbling Vireo (a density of 6 territorial males in 1982 was unusually high), Grace's Warbler, and Painted Redstart (normally a fairly abundant breeder). The latter were seen on census trips in May, but absence of later sightings would indicate they did not nest. The number of territorial male Bewick's Wrens dropped from 12 in 1982. Perhaps this resident species relocated downstream in good habitat not noticeably affected by the April freeze and this decline may not be unusual. Brown Creeper and Hermit Thrush were added possibly since the time duration of the census field season was longer (to July 5 in 1982; to Aug. 2 in 1983). There is a long breeding period from early nesters (Gray-breasted Jays are nest building in March) to the late breeders (Brown Creepers feeding nestlings in August). Since the plot is located between 2 Forest Service campgrounds, there has been concern over the possibility of overuse by campers but the condition of the trees, shrubs and ground cover appears to be stable. There was damage, especially to junipers and live oak trees, from a snow storm Jan. 1 when up to 10 in. of snow followed a rain. With normal growth, the loss should eventually be restored. Thanks to S. M. Russell for his assistance.—**HARRIETTE BARKER**, 5302 S. Missiondale, Tucson, AZ 85706.

144. JUNIPER-OAK WOODS ON LIMESTONE HILLS. — **Location:** Texas; Travis Co., N-W Austin, within city limits, W of the S end of Ridge Oak Drive). **Continuity:** Established 1952; 4 intermittent years. **Size:** Approximately 15.1 ha = 37.3 acres. **Description of Plot:** Watershed of small creek flowing W from steep limestone hills; hill-sides clad with open Juniper-Oak woods with



BBC 144, Austin, Tex. Juniper-Oak Woods on Limestone Hills. Photo/D. Webster.

Ashe Juniper occupying about 50% of the surface area, Texas Oak 15%, Bigelow Oak 5%, and grassy slopes 30%. Trees are mostly less than 15 ft tall. On the upper hillsides the trees grow more densely and oaks predominate (Texas Oak 60%, Ashe Juniper 35%, Bigelow Oak 5%). In the creek bottom, along with the species previously mentioned, are Texas Ash, Black Cherry, and Cedar Elm. Some of these are 25-35 ft tall. **Edge:** Bounded on most sides by similar growth, but on the E side by an underground reservoir. A residence lies on the SE corner of the tract. **Elevation:** 550-865 ft. **Weather:** Relatively mild, early spring. Rainfall was less than usual. **Coverage:** Mar. 1, 5, 10, 13, 17, 20, 23, 27, 31; Apr. 3, 7, 10, 21, 26; May 5, 8, 12, 23; June 2, 17, 24; dawn-2200 hrs. Total obs.-hours: 68. **Census:** N. Cardinal, 16 (106, 43); Mourning Dove, 6 (40, 16); White-eyed Vireo, 6; Golden-cheeked Warbler, 5 (33, 13); Black-chinned Hummingbird, 4 (26, 11); Carolina Chickadee, 4; Carolina Wren, 4; Yellow-billed Cuckoo, 3 (20, 8); Tufted Titmouse, 3; Bewick's Wren, 3; Greater Roadrunner, 2; Blue Jay, 2; Rufous-crowned Sparrow, 2; N. Bobwhite, 1; E. Screech-Owl, 1; Chuck-will's-widow, 1; Great Crested Flycatcher, 1; Scrub Jay, 1; N. Mockingbird, 1; Black-and-white Warbler, 1; Brown-headed Cowbird, +. **Total:** 21 species; 67 territorial males or females ($444/\text{km}^2$, 180/100 acres). **Visitors:** Great Blue Heron, Black Vulture, Turkey Vulture, Red-tailed Hawk, Rock Dove, Inca Dove, Great Horned Owl, Chimney Swift, Belted Kingfisher, E. Phoebe, W. Kingbird, Scissor-tailed Flycatcher, Purple Martin, Rough-winged Swallow, Barn Swallow, Am. Crow, Eur. Starling, Chipping Sparrow, Field Sparrow, Great-tailed Grackle, House Finch, Lesser Goldfinch, House Sparrow. **Remarks:** This area was chosen 31 years ago as a census tract because it represented a relict stand of Golden-cheeked Warbler nesting habitat. At that time it was near a thriving residential area

and was predicted to eventually become unfit for Golden-cheeked Warblers. During the intervening years the hills surrounding this area have become filled with housing developments. Only a thin border of similar habitat separates this tract from residential areas. In 1952, 1953, and 1954, respectively, 6.5, 6.5, and 5.5 Golden-cheeked Warblers were reported to have nested. This year we recorded 5. Apparently the surrounding development has not drastically affected the nesting of this species. Three birds that were regular breeders 30 years ago were, however, not even seen this year (Yellow-breasted Chat, Summer Tanager, and Painted Bunting). An approximately two-fold (8.5 to 16) increase in the population of N. Cardinals was perhaps the most striking consequence (presumably) of nearby residential development. This tract is also of interest because of its location on the fault line that in central Texas marks the geographical border between East and West. This accounts for Blue Jay and Scrub Jay nests within 300 m of each other (nests found) and both E. and W. kingbird visitors. The census was repeated this year in order to determine whether 30 years of encroaching residential development near this area had affected the breeding bird population. While some of the species once recorded are no longer seen, a large majority of the bird life remains, and is expected to stay indefinitely, unless this tract falls to housing developments, too.—**EDWARD DEMOLL** (compiler), **MEL ECKHOFF**, and **FRED S. WEBSTER, JR.**, 6419 Winnipeg Road, Bethesda, MD 20817.

145. SECOND-GROWTH MIXED FOREST. — **Location:** British Columbia; N. Vancouver District Municipality, extending from entrance to Mt. Seymour Prov. Park W to E end of Hyannis Drive; $49^\circ 19' 30''\text{N}$, $123^\circ 58' 00''\text{W}$. **Continuity:** New. **Size:** 20.29 ha = 50.10 acres (strip, measured by pacing). **Description of Plot:** Second-growth coastal



BBC 145, N. Vancouver, B.C. Second-growth Mixed Forest. Photo/M. Daly.

forest, varying from about 15 to $80 \pm$ years old. The area lies within the dry subzone of the Coastal Western Hemlock Zone, and receives about 200 cm of precipitation annually. The plot includes 2 major habitat types: (1) older forest, with trees mainly 25-30 m tall, dominated by W. Hemlock, W. Redcedar, and Douglas-fir; and (2) younger forest, with trees mainly 6-10 m tall, dominated by Red Alder. Common trees and shrubs on the plot (C for conifer forest, A for alder forest) include: Vine Maple (C, A); Red Alder (C, A); Salal (C, A); W. Raspberry (A); Thimbleberry (C, A); Salmonberry (C, A); W. Blackberry (C, A); willows (C, A); Pacific Red Elder (C, A); W. Redcedar (C); W. Hemlock (C, A); and Red Huckleberry (C). Conifer forest comprises about 39% of the plot, and alder forest about 61%. **Edge:** Bordered on the N and S by extensive stands of similar habitat. A residential subdivision forms the W boundary, and a wide paved road the E boundary. The census route follows an abandoned road (2-3 m wide) down the middle of the plot, which has produced some "edge" within the plot itself, and has allowed the growth of small alders and cottonwoods along the road edge even in the coniferous sections. **Topography:** Located on the lower slopes of Mt. Seymour (height 1451 m); the E half of the plot follows a contour line on the mountain, but the W half is more hilly. **Elevation:** About 100-150 m. **Weather:** Temp., 15-23°C; 4 censuses had overcast skies, 3 had clear skies and 1 had mixed cloud cover. Slight breeze on May 14; no precipitation. **Coverage:** Apr. 30; May 14, 21, 28; June 11, 25; July 10, 17; 0700-0930, PDST. Total obs.-hours: 13.9. **Census:** Am. Robin, 7 (34, 14); Swainson's Thrush, 6 (30, 12); Rufous-sided Towhee, 5.5 (27, 11); W. Flycatcher, 4 (20, 8); Rufous Hummingbird, 3 (15, 6); Black-throated Gray Warbler, 3; Black-headed Grosbeak, 3; Song Sparrow, 3; Hammond's Flycatcher, 2.5; Winter Wren, 2.5; Wilson's Warbler, 2.5; Warbling Vireo, 2; Red-eyed Vireo, 2; Orange-crowned Warbler, 2; Townsend's Warbler, 2; Brown-head-

ed Cowbird, 2; Golden-crowned Kinglet, 1.5; Willow Flycatcher, 1; Bewick's Wren, 1; MacGillivray's Warbler, 1; W. Tanager, 1; Chestnut-backed Chickadee, 0.5; Hutton's Vireo, 0.5; Purple Finch, 0.5; Band-tailed Pigeon, +; Red-breasted Sapsucker, +; Hairy Woodpecker, +; Pileated Woodpecker, +; Black-capped Chickadee, +; Varied Thrush, +; Cedar Waxwing, +; Solitary Vireo, +; Pine Siskin, +. **Total:** 33 species; 59 territorial males or females ($291/\text{km}^2$, 118/100 acres).

Visitors: Sharp-shinned Hawk, Blue Grouse, Ruffed Grouse, Downy Woodpecker, N. Flicker, Barn Swallow, Steller's Jay, Com. Raven, Red-breasted Nuthatch, Brown Creeper, House Finch, Red Crossbill, Am. Goldfinch, Evening Grosbeak. **Remarks:** Nests found: Am. Robin (2), Red-eyed Vireo (2), Hairy Woodpecker (1), Chestnut-backed Chickadee (1). The Red-eyed Vireo nests were both low down in Red Alders. Nests of this species are usually hard to locate (average of 2 per year over the last 5 years for British Columbia in total). Breeding species confined to the coniferous forest were: Golden-crowned Kinglet, Hutton's Vireo, W. Tanager, Brown-headed Cowbird, Purple Finch and Pine Siskin. Breeding species confined to the deciduous forest were: Hairy Woodpecker, Willow Flycatcher, Cedar Waxwing, Warbling Vireo, Red-eyed Vireo, Orange-crowned Warbler and Black-headed Grosbeak. Breeding species possibly attracted to the "edge" on either side of the census road included: Bewick's Wren, Rufous-sided Towhee, Song Sparrow and Brown-headed Cowbird. Three small creeks cross the plot and attract several visitors. Four-wheel drive trucks have destroyed Red Alders and other vegetation in a large number of places along the census road. Many thanks to Wayne C. Weber for his help with the vegetation study.—**MARK K. DALY, 1499 Avon Lynn Crescent, North Vancouver, B.C. V7J 2V2.**

146. MIXED MOUNTAIN BOTTOM-LAND.—

Location: British Columbia; Kootenay Land District, Mount Revelstoke Nat'l Park, 1 km (0.6 mi) NW of Lauretta Siding; $51^\circ 5' 20''\text{N}$, $117^\circ 55' \text{W}$; Canadian Nat'l Topographic System, Map Sheet 82N/4. **Continuity:** Established 1982. **Size:** 6.4 ha = 15.81 acres. **Description of Plot:** See AB 37:90-1 (1983). **Weather:** Temp. at dawn: 48-59°F. Sky completely overcast on 2 days and with varying cloud cover on 7 days. **Coverage:** June 1, 7, 15, 17, 21-24, 27; 0410-0640 hrs, PDT. Total obs.-hours: 14. **Census:** Song Sparrow, 12 (188, 76); Com. Yellowthroat, 9 (141, 57); MacGillivray's Warbler, 7.5 (117, 47); Yellow Warbler, 7 (109, 44); Rufous Hummingbird, 2.5; Veery, 2; Warbling Vireo, 2; Am. Redstart, 2; N. Waterthrush, 1.5; Com. Crow, 1; Black-capped Chickadee, 1; Swainson's Thrush, 1; Red-eyed Vireo, 1; Pileated Woodpecker, +; Hammond's Flycatcher, +; Golden-crowned Kinglet, +; Orange-crowned Warbler, +; Magnolia Warbler, +. **Total:** 18 species; 49.5 territorial males or females ($774/\text{km}^2$, 313/100 acres).

Visitors: Mallard, Am. Kestrel, Vaux's Swift, Hairy Woodpecker, W. Wood-Pewee,

Willow Flycatcher, Steller's Jay, Cedar Waxwing, Am. Robin, Eur. Starling, Brown-headed Cowbird, Pine Siskin. **Remarks:** The pair of Am. Crows fledged 1 young during the period.—**LES W. GYUG, Canadian Wildlife Service, Box 1349, Revelstoke, B.C., V0E 2S0.**

147. MONTANE MIXED FOREST.—

Location: British Columbia; Kootenay Nat'l Park; 38 km (24 mi) NE Radium Hot Springs; $50^\circ 49' 50''\text{N}$, $116^\circ 3' 10''\text{W}$; Canadian Nat'l Topographic System, Map Sheet 82K/16. **Continuity:** New. **Size:** 14 ha = 34.59 acres (rectangle, tape-measured, 350 × 400 m).

Description of Plot: A heterogenous mixture of Lodgepole Pine, White Spruce, Paper Birch, and Douglas-fir forms a predominately closed canopy with open phases over the entire plot. Quaking Aspen, an important deciduous component of the canopy, has a patchy distribution and is most prevalent at the extreme E and W edges owing to the influence of stream channels at those locations. A moderately dense and species-rich shrub layer is primarily Soapberry and regenerating Lodgepole Pine, White Spruce and Douglas-fir. Less abundant shrub species present include W. Serviceberry, Green Alder, False Azalea, Red-osier Dogwood, Mountain Maple and Paper Birch. Ground cover consists of Prickly Rose, Low-bush Cranberry, Twinflower, Bunchberry, Pine Grass (*Calamagrostis rubescens*) and Feathermoss (*Hylocomium splendens*). Moist depressions contain Labrador Tea and Brown Moss (*Tomentypnum nitens*). A quantitative survey of the vegetation gave: Trees 3-in. diameter and over, based on five 0.1-acre circular plots, 269/acre; total basal area, 125.8 ft²/acre. Species comprising 99% of the total tree cover [figures after each give number of trees/acre, relative density (%), relative dominance (%), frequency (%), respectively]: Lodgepole Pine, 190, 70, 66, 100; White Spruce, 48, 18, 23, 100; Paper Birch, 16, 6, 4, 80; Douglas-fir, 14, 5, 4, 60. Trees by diameter class [figures after each class give number trees/acre, relative density (%), basal area (ft²/acre), relative dominance (%)]: A (3-6 in.) 70, 26, 7, 6; B (6-9 in.) 112, 42, 33.6, 27; C (9-15 in.) 78, 29, 67.2, 53; D (15-21 in.) 10, 4, 18, 14. Shrub stems/acre, 1860; ground cover, 98%; canopy cover, 41%; canopy height, 53 ft (range 40-70). The plot is bounded on the E and W by small streams which do not create significant breaks in the canopy. There is a higher incidence of Quaking Aspen in the canopy at these locations than elsewhere, affecting the distribution of species such as Hammond's Flycatcher and Warbling Vireo. Paralleling, but outside the N boundary is a 10 ft wide fire access road which produces a narrow break in the canopy attracting such species as W. Wood-Pewee, Olive-sided Flycatcher and Am. Robin. Natural thinning of Lodgepole Pine has opened the canopy over 50% of the plot, promoting the development of a species rich understory as well as producing considerable amounts of deadfall. **Edge:** A similar mixedwood vegetation type exists on all sides. **Topography:** A gently sloping, NE-facing fluvial apron rang-

ing in elevation from 4200 ft at the NE corner to 4400 ft at the SW corner, 150 ft above Dolly Varden Creek, a tributary of the Kootenay River. The soil is a moderately well drained Eutric Brunisol. **Weather:** Temp. 35-40°F at dawn. Clear skies with ground fog on 2 days; overcast with light rain for 1 day; partly cloudy on other days. Winds on all days less than 5 mph. An unusually high rainfall occurred in the area from late June through July. **Coverage:** June 27-28; July 4-5, 14; 0530-0930 hrs. MDT. Total obs.-hours: 16. **Census:** Dark-eyed Junco, 5 (36, 14); Hammond's Flycatcher, 3.5 (25, 10); Swainson's Thrush, 2; Golden-crowned Kinglet, 2; Orange-crowned Warbler, 2; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; Am. Robin, 1; Townsend's Warbler, 1; W. Wood-Pewee, 0.5; Olive-sided Flycatcher, 0.5; Warbling Vireo, 0.5; Purple Finch, 0.5; Rufous Hummingbird, +; Ruby-crowned Kinglet, +; Yellow-rumped Warbler, +; Chipping Sparrow, +. **Total:** 17 species; 20.5 territorial males ($146/\text{km}^2$, 59/100 acres).

Visitors: N. Flicker, Gray Jay, Black-capped Chickadee, Mountain Chickadee, Cedar Waxwing, W. Tanager, Pine Grosbeak, Red Crossbill, Pine Siskin. **Remarks:** Nest located: Hairy Woodpecker.—DAVID M. POLL, Canadian Wildlife Service, #1000, 9942-108 Street, Edmonton, Alberta, T5K 2J5.

148. PINE-OAK WOODLAND. — **Location:** California, San Diego Co., Cuyamaca Rancho State Park, 4.8 km E of Green Valley Falls Campground at Highway 79; near 32°55'N, 116°32'W, Cuyamaca Peak Quadrangle, USGS. **Continuity:** New. **Size:** 11.6 ha = 28.7 acres ($400 \times 250 \times 330 \times 408$ m, measured with meter tape using compass bearings). **Description of Plot:** Open pine-oak woodland dominated by California Black Oak 62%, Jeffrey Pine 26% and Coast Live Oak 12%. Understory open, composed primarily of low perennials (*Linanthus nuttallii*, *Eriogonum wrightii*, *Galium andrewsii*), perennial grasses, and annuals (*Bromus diandrus*, *Avena barbata*, *Galium aparine*). Some areas are brushy (*Cercocarpus betuloides*, *Arctostaphylos pungens*). A deer grass (*Muhlenbergia rigens*) dominated swale bisects the plot. Vegetative cover was determined by averaging three 50×2 m belt transects and a 100×100 m tree plot. **Edge:** Surrounded on all sides by similar vegetation, although a permanent stream lies nearby to the E and a perennial grassland to the W. **Topography:** Predominantly an E-facing slope, less than 25%, with 2 prominent flat areas. **Elevation:** 4840-5040 ft. **Weather:** Max. and min. mean temp., 6.8-20°C; no ppt. **Coverage:** Apr. 28-30; May 20-21, 28, 30; June 24; 0630-0930. Total obs.-hours: 21.5. **Census:** Plain Titmouse, 4 (34, 14); Acorn Woodpecker, 3 (26, 10); Mountain Chickadee, 3; Rufous-sided Towhee, 3; Mountain Quail, 2; Band-tailed Pigeon, 2; N. Flicker, 2; Violet-green Swallow, 2; Steller's Jay, 2; Scrub Jay, 2; White-breasted Nuthatch, 2; W. Bluebird, 2; Eur. Starling, 2; N. Oriole, 2; California Quail, 1; Mourning Dove, 1; Anna's Hummingbird, 1; Hairy Woodpecker, 1; Olive-sided Fly-

catcher, 1, W. Wood-Pewee, 1, W. Flycatcher, 1; Ash-throated Flycatcher, 1; Bush-tit, 1; W. Tanager, 1; Black-headed Grosbeak, 1; Dark-eyed Junco, 1; Brown-headed Cowbird, 1. **Total:** 27 species; 46 territorial males ($396/\text{km}^2$, 160/100 acres). **Visitors:**

Red-tailed Hawk, Am. Kestrel, Nuttall's Woodpecker, W. Kingbird, N. Raven, Pygmy Nuthatch, Ruby-crowned Kinglet, Solitary Vireo, Hutton's Vireo, Warbling Vireo, Orange-crowned Warbler, Yellow Warbler, Black-throated Gray Warbler, Townsend's Warbler, Hermit Warbler, Wilson's Warbler, W. Meadowlark, House Finch, Lesser Goldfinch. **Remarks:** This work was supported by the California Department of Parks and Recreation. Thanks to Nancy Gilbert, Jeri Hirshberg, Larry LaPre, Steve Boyd and Doug Hogan for assistance with the vegetation analysis.—HAROLD A. WIER, 2384 Ridge View Drive, San Diego, CA 92105.

149. PINE-OAK WOODLAND. Location:

California, San Diego Co., Cuyamaca Rancho State Park, North Peak, 33°0'N, 116°36'W, Julian Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres, (200×500 m, determined by pacing; 1 side measured with steel tape). **Description of Plot:**

A dense pine-oak woodland. Total vegetative cover exceeds 100%, visibility throughout the plot is less than 25 m. Dominant tree species include Incense Cedar 48% cover, Canyon Live Oak 70%, and California Black Oak 5%. Trees which occur in small numbers include White Fir, Sugar Pine, and Ponderosa Pine. The shrub layer is dominated by California Lilac, Pringle Manzanita, and California Buckthorn. There is an herbaceous layer consisting of plants such as Fairy Lantern and a bedstraw, *Galium andrewsii*. Vegetative cover was determined using three 50×2 m belt transects for shrubs and three 10×10 m square plots for trees. **Edge:** Surrounded by similar vegetation. **Topography:** Slope is 15-35%, W-facing. A few small drainages run through the plot. **Elevation:** 4900 ft (1494 m). **Weather:** 6.8-20°C, ppt. = 7.0 cm. Some of the precipitation in this area is in the form of thick fog. **Coverage:** Apr. 15, 22; May 13, 20, 22; June 2, 3, 7; mostly 0600-1000 and 1600-1730. Total obs.-hours: 30. **Census:** Black-throated Gray Warbler, 26 (260, 105); Anna's Hummingbird, 19 (190, 77), Mountain Chickadee, 19; Dark-eyed Junco, 16 (160, 65); W. Tanager, 13 (130, 53); Scrub Jay, 12 (120, 49); Rufous-sided Towhee, 11 (110, 45); Lesser Goldfinch, 8 (80, 32); Ash-throated Flycatcher, 7 (70, 28); Band-tailed Pigeon, 4.5 (45, 18); Mountain Quail, 4 (40, 16); Hutton's Vireo, 4; N. Flicker, 3 (30, 12); Olive-sided Flycatcher, 3; W. Wood-Pewee, 3; Purple Finch, 3; Plain Titmouse, 2; Brown-headed Cowbird, 2; Black-headed Grosbeak, 1.5; White-headed Woodpecker, 0.5; Acorn Woodpecker colonies, 9 (90, 36). **Total:** 21 species; 171 territorial males ($1711/\text{km}^2$, 692/100 acres). **Visitors:** One raven, Red-tailed Hawk; Spotted Owl was heard. **Remarks:** This work was supported by the Calif. Dept. of Parks and Recreation. Thanks to Eric and

Harold Wier, Larry LaPre, Steve Boyd, David Hawks, Nancy Gilbert, and Jerilyn Hirshberg for assistance with the vegetation analysis.—KARLA J. KRAMER, 2803 Iron Hills Way, Riverside, CA 92506.

150. MONTANE WILLOW CARR. —

Location: Colorado; Boulder Co., $\frac{1}{2}$ mi W of Nederland; 39°58'N, 105°32'W; Sec. 14 and 15, T1S, R73W, 6th P.M., Nederland Quadrangle, USGS. **Continuity:** New. **Size:** 3 84 ha = 9.49 acres (irregular rectangle 50×625 m, surveyed, gridded 25×25 m). **Description of Plot:**

The dominant vegetation is an association of Geyer Willow, Mountain Willow, reedgrass, sedges, and scattered living and dead coniferous trees. The vegetation is interspersed with ponded water, primarily the result of Beaver (*Castor canadensis*) activity. A quantitative survey of the vegetation, using six 50m line samples, yielded the following percent cover values (comprising 96% of the ground coverage): Geyer Willow, 27; water, 25; Mountain Willow, 13; Bluejoint Reedgrass (*Calamagrostis canadensis*), 10; sedge (*Carex* spp.), 5; grass (*Poa* spp.), 3; Mountain Alder, 2; Tufted Hairgrass (*Deschampsia caespitosa*), 2; Shrubby Cinquefoil, 2; Timothy (*Phleum pratense*), 2; Strapleaf Willow, 2, rush, 1; Tall Mertensia, 1; White Clover, 1. Using the same line samples, the following represents the percentage of shrubs (willows, Mountain Alder, Shrubby Cinquefoil) at the specified heights (range of $\pm .25$ m from specified height): 0.75m, 8; 1.25m, 6; 1.75m, 31; 2.25m, 13; 2.75m, 19; 3.25m, 17; 3.75m, 4; 4.25m, 2. Also present in plot are 14 scattered coniferous trees (Lodgepole Pine, Blue Spruce, Engelmann Spruce) and 13 dead tree boles. A small stream (average width 1 m) runs through the plot. **Edge:** Bordered on all sides by a thin strip of similar vegetation, surrounding area is 40% coniferous forest, 25% dirt road, 20% open meadow, 15% deciduous forest. **Topography:** Flat. **Elevation:** 8480 ft. **Weather:** Cooler and more precipitation than normal throughout period, with winter and spring snows melting later than normal. **Coverage:** May 28; June 3, 5, 13, 18, 20, 24, July 4, 9, 18, 25; dawn to 1130. Total obs.-hours 42. **Census:** Wilson's Warbler, 15.5 (404, 163); Lincoln's Sparrow, 12 (312, 126); Song Sparrow, 8 (208, 84); Dusky Flycatcher, 6.5 (169, 68); Am. Robin, 6 (156, 63); Warbling Vireo, 4 (104, 42); MacGillivray's Warbler, 3 (78, 32); Red-winged Blackbird, 3; Broad-tailed Hummingbird, 2.5; Fox Sparrow, 2; Swainson's Thrush, 1.5; Green-winged Teal, 1; Mallard, 1; Com. Snipe, 1; Yellow Warbler, 1; Gray-headed Junco, 1; Spotted Sandpiper, 0.5; Brown-headed Cowbird, 0.5; Yellow-bellied Sapsucker, +. **Total:** 19 species, 70 territorial males or females ($1823/\text{km}^2$, 738/100 acres). **Visitors:** Cooper's Hawk, Red-tailed Hawk, Com. Nighthawk, Belted Kingfisher, N. Flicker, Tree Swallow, Violet-green Swallow, Barn Swallow, Mountain Chickadee, Ruby-crowned Kinglet, Gray Catbird, Yellow-rumped Warbler, Black-headed Grosbeak, White-crowned Sparrow, Pine Siskin. **Remarks:** Nests found (16): Mallard (1),



BBCs 150 & 151, Boulder Co., Colo. Montane Willow Carr. Photo/D. Hallock.

Dusky Flycatcher (1), Am. Robin (6), Wilson's Warbler (1), Song Sparrow (3), Lincoln's Sparrow (1), Red-winged Blackbird (3). Violet-green Swallow and White-crowned Sparrow would utilize plot until snow cover decreased and insect population increased at higher elevations. Special thanks to Marion Geick for access to the property.—**DAVE HALLOCK**, Center for Mountain Bird Ecology, Eldora Star Route, Nederland, CO 80046.

151. MONTANE WILLOW CARR.—**Location:** Colorado; Boulder Co., 1.5 mi N of Allenspark; 40°13'N, 105°32'W; NE $\frac{1}{4}$ Sec. 22 and NW $\frac{1}{4}$ Sec. 23, T3N, R73W, Allenspark Quadrangle, USGS. **Continuity:** New. **Size:** 13 ha = 32.12 acres (2 adjacent rectangles, 150 × 200m and 200 × 500m; surveyed with compass and tape, gridded 25 × 25m). **Description of Plot:** The canopy is dominated by Mountain Willow and Geyer Willow and by Water Birch. The understory is dominated by Swamp Honeysuckle and Blue-joint Reedgrass (*Calamagrostis canadensis*). A quantitative survey of percent cover based on six 50-m line-intercept transects gave the following percentages (comprising 97.9% of the total cover): Park Willow 31.0%; Water Birch 25.2%; water 21.5%; Geyer Willow 9.3%; Swamp Honeysuckle 3.3%; *Calamagrostis canadensis* 3.0%; grasses (mostly *Poa* spp.) 2.8%; a willow (*Salix subcoerulea*) 1.8%. Fifty shrubs measured for height at 5-m intervals along the same transects fell into the following height classes: 0-0.5m—0%, 0.5-1.0m—8%, 1.0-1.5m—4%, 1.5-2.0m—12%, 2.0-2.5m—16%, 2.5-3.0m—10%, 3.0-3.5m—12%, 3.5-4.0m—12%, over 4.0m—26%. Scattered throughout the plot are several coniferous trees (Lodgepole Pine, Ponderosa

Pine, Engelmann Spruce). The plot is bisected by North St. Vrain Creek which averages 15.5 m in width. There are 33 beaver ponds in the plot. Based on the 25-m grid map, water comprises 24.3% of the ground cover. **Edge:** E and W sides are willow carr, S side a thin strip (5-50 m) of willow carr bordered by coniferous forests with some small stands of Quaking Aspen; N side a thin strip (5-50 m) of willow carr bordered by meadows, coniferous forests, and stands of aspen; 25 m of grassland and 75 m of aspen along the border cross over the boundary for a short distance (1-20 m) into the plot. **Topography:** Flat valley bottom. **Elevation:** 8320 ft. **Weather:** Through May 19 temperatures stayed below 43°F; up to 3 in. of snow on the ground; after that temperatures ranged from 39-72°. Runoff began last week of May, but did not peak until mid-June, and was still high on July 11. **Coverage:** May 11, 19, 25, 27, 29; June 2, 7, 15, 24; July 11; 0645-1400 and 1630-1845 hours. Total obs.-hours: 48.5. **Census:** Wilson's Warbler, 41 (315, 128); Lincoln's Sparrow, 16 (123, 50); Song Sparrow, 15.5 (119, 48); Am. Robin, 12.5 (96, 39); Broad-tailed Hummingbird, 12 (92, 37); Dusky Flycatcher, 9 (69, 28); Swainson's Thrush, 7.5 (58, 23); Warbling Vireo, 7.5; Black-headed Grosbeak, 6.5 (50, 20); Red-winged Blackbird, 6.5; MacGillivray's Warbler, 4 (31, 12); Fox Sparrow, 4; Green-winged Teal, 3 (23, 9); Mallard, 3; Yellow Warbler, 3; Brown-headed Cowbird, 3; Spotted Sandpiper, 2.5; Corn. Snipe, 2; Yellow-bellied Sapsucker, +; Black-capped Chickadee, +; House Wren, +; Pine Siskin, +. **Total:** 22 species; 158.5 territorial males or females (1219/km², 493/100 acres). **Visitors:** Black Swift, N. Flicker, Tree Swallow, Violet-green Swallow, Barn Swallow, Am. Crow, Mountain Chickadee, Am. Dipper,

Ruby-crowned Kinglet, Yellow-rumped Warbler, Com. Grackle, Am. Goldfinch, Evening Grosbeak. **Remarks:** Nests found: Mallard 1, Broad-tailed Hummingbird 1, Am. Robin 8, Black-headed Grosbeak 1, Pine Siskin 1. Eastern 4.5 ha grazed by horses. Green-winged Teal, Swainson's Thrush, Yellow Warbler, MacGillivray's Warbler, Red-winged Blackbird, and Fox Sparrow did not have territories in this grazed portion. Green-winged Teal, Mallard, and Brown-headed Cowbird did not have obvious territories, and their populations were estimated by daily high counts of flocking males. On June 24 and July 11 much of the plot was flooded by as much as 6 in. of runoff from snowmelt. This unusually high and prolonged runoff made censusing extremely difficult. Thanks to Dave Hallock and Nan Lederer for helping to survey the plot.—**MIKE FIGGS**, 2216 Bluff St., Boulder, CO 80302.

152. 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 $\frac{1}{4}$ of NE $\frac{1}{4}$, Sec. 10, T1S, R71W; 39°58'12"N, 105°20'16"W, Eldorado Springs Quadrangle, USGS. **Continuity:** Established 1981, 3 consecutive years. **Size:** About 13 ha = 32 acres. **Description of Plot:** See AB 36:90 (1982). **Weather:** Winter dry and warm until mid-March, then heavy snows, rain lasting until end of May. Very warm from mid-June on. Temp. range, 25-85°. **Coverage:** May 1, 8, 14, 26, 29-30; June 2, 12, 23, 29; July 3-4, 7, 9, 15, 27; Aug. 6-7; generally from 0700-1030 or 1600-2000. Total obs.-hours: 46. **Census:** Dark-eyed Junco, 5 (39, 16); Chipping Sparrow, 5; House Wren, 4 (31, 13); Mountain Bluebird, 4; Am. Robin, 4; Vesper Sparrow, 4; Mountain Chickadee, 3 (23, 9); Yellow-rumped Warbler, 3; Pine Siskin, 3; Tree Swallow, 2; Violet-green Swallow, 2; W. Tanager, 2; Corn. Nighthawk, 1.5; Com. Poorwill, 1.5; Broad-tailed Hummingbird, 1; Hairy Woodpecker, 1; N. Flicker, 1; Steller's Jay, 1; White-breasted Nuthatch, 1; Pygmy Nuthatch, 1; Townsend's Solitaire, 1; Solitary Vireo, 1; Warbling Vireo, 1; Lesser Goldfinch, +. **Total:** 24 species; 53 territorial males or females (409/km², 166/100 acres). **Visitors:** Turkey Vulture, Blue Grouse, Mourning Dove, Great Horned Owl, W. Flycatcher, Barn Swallow, N. Raven, Red-breasted Nuthatch, Hermit Thrush, Brewer's Blackbird, Red Crossbill. **Remarks:** Study began and ended 2 weeks later than previous years because of cold snowy spring. For example, Mountain Bluebirds were seen in area as early as March 13 but did not nest until late May. Large flocks of them were seen in Boulder (2000 ft lower in elevation) through May when it was snowing and blowing at the 7600-ft altitude of the plot. Nests found (in addition to nesting boxes which were mostly occupied): Mountain Chickadee, Mountain Bluebird, W. Tanager, Dark-eyed Junco.—**HELEN J. STILES-WAINWRIGHT and ARTHUR WAINWRIGHT**, 150 S. 36th Street, Boulder, CO 80303.

153. SUBALPINE WILLOW CARR.

— **Location:** Colorado, Boulder Co., 5 km W of Ward, 0.25 km E of Brainard Lake; Sec. 3 and 4, T1N, R73W; 40°5'N, 105°34'W; Ward Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (2 adjacent rectangles, 150 × 500 m and 100 × 250 m, surveyed with compass and tape). **Description of Plot:** The dominant shrubs are Planeleaf Willow and Bog Birch. The dominant ground cover in the wet areas is sedge, primarily *Carex aquatilis*; in the dry areas grasses and forbs, primarily reed-grass (*Calamagrostis* sp.), Tall Mertensia and Arrowhead Butterwort. Approximately 1 ha consists of forest islands of Engelmann Spruce and Subalpine Fir. Small trees of both are scattered throughout the plot. A quantitative survey of percent cover in the shrub vegetation based on six 50-meter line-intercept transects gave the following results: willow (almost all Planeleaf) 54.5%, sedges (almost all *Carex aquatilis*) 31.6%, Bog Birch 9.2%, grasses and forbs 2.7%, Engelmann Spruce 0.9%, and water 1.2%. 300 shrubs measured for height at 1-m intervals along the same transects fell into the following height classes: 0-0.5 m—31.3%, 0.5-1.0 m—34.7%, 1.0-1.5 m—23.0%, 1.5-2.0 m—7.0%, over 2.0 m—4.0%. **Edge:** Bordered on all sides by narrow strip of willow carr; surrounding area is subalpine coniferous forest. **Topography:** Very gently sloping. **Elevation:** 10,280 ft. **Weather:** Unusually late, snowy spring. Most of plot remained snow-covered until late June. Temp. range, 37-65°F. **Coverage:** June 7, 18, 25, 29; July 2, 5, 10, 14, 21; 0615-1150 and 1630-1900. Total obs.-hours: 33.5. **Census:** (Territories in forest islands only*) Wilson's Warbler, 25 (250, 101); Lincoln's Sparrow, 20 (200, 81); White-crowned Sparrow, 9 (90, 36); Yellow-rumped Warbler*, 2; Com. Snipe, 1.5; Dark-eyed Junco*, 1.5; Dusky Flycatcher, 1; Mountain Chickadee*, 1; Am. Robin,* 1; Pine Siskin,* 1; Fox Sparrow, 0.5. **Total:** 11 species; 63.5 territorial males (635/km², 257/100 acres). **Visitors:** Sharp-shinned Hawk, Broad-tailed Hummingbird, Olive-sided Flycatcher, Gray Jay, Swainson's Thrush, Hermit Thrush, Brown-headed Cowbird, Pine Grosbeak. **Remarks:** Nests found: Lincoln's Sparrow (1), White-crowned Sparrow (1), Pine Siskin (1). The plot is somewhat heterogeneous due to the forest islands and nearness to forest edge, which is typical of subalpine willow carrs in this area. The densities of Wilson's Warbler, Lincoln's Sparrow and White-crowned Sparrow may have been underestimated because of the birds' tendency to choose trees outside the plot for singing perches. Thanks to Mike Figgs who helped survey the plot.—NANCY D. LEDERER, 2216 Bluff St., Boulder, CO 80302.

154. SUBURBAN COLLEGE CAMPUS. — **Location:** Colorado; Jefferson Co., Rockmont College Campus and adjoining church property, Lakewood. 39°43'N, 105°6.5'W, Fort Logan Quadrangle, USGS. Bounded on N by W. Bayaud Ave. and private property, S by W. Alameda Ave. and

church property, E by back yards of suburban residences, W by S. Garrison St. and church property. **Continuity:** New. **Size:** 18.3 ha = 45.2 acres (established from architectural map; L-shaped, 1,780 ft E-W by 1,280 ft N-S with 750 ft E-W by 390 ft N-S rectangle deleted from SW corner). **Description of Plot:** Buildings comprise 3% of area; paved parking lots, roadways, and walkways about 5%; 2 ponds cover about 1.5 ha or 8%. About 40% is mown grass (chiefly *Poa* sp.) and about 35% is disturbed area covered by various grasses including Barnyard Grass (*Echinochloa crusgalli*), Orchard Grass (*Dactylis glomerata*), Foxtail Grass (*Hordeum* sp.), and Cheat Grass (*Bromus tectorum*), and herbaceous plants dominated by a tansy mustard (*Descurainia sophia*), Yellow Sweet Clover, Prickly Lettuce, salsify, *Allysum minus*, Gumweed, ragweed, Cheeseweed, knotweed, and Canada Thistle. A small slough that feeds and drains the ponds is lined by cat-tail, White-top Mustard, dock, Showy Milkweed, and Peachleaf Willow. The plot is largely bordered by rows of planted trees, there is a row and small grove of planted trees within the campus, and exotic trees and shrubs are planted around the buildings. By far the most abundant tree is Chinese Elm, but Ponderosa Pine, various junipers, and Russian-olive are also common. Large willows are present around the ponds. Other trees that occur in numbers include spruce, Plains Cottonwood, locust (*Gleditsia* sp.) and maple. Exotic shrubs include Pfitzer Juniper, *Potentilla* sp., privet, lilac, and *Cotoneaster*. **Topography:** Slopes gently E from about 5546 ft on the W edge to about 5498 ft at the bottom of a slough on the E edge. **Weather:** Temp. range, 34-93°F; average about 3.5° below normal. Rainfall was far above normal. **Coverage:** Apr. 23, 29; May 6, 14, 21, 25; June 2, 9, 17, 24; July 1; 0830-1000. Total obs.-hours: 15. **Census:** House Sparrow, 18 (98, 40); Eur. Starling, 9 (49, 20); Red-winged Blackbird, 9; Mallard, 6 (33, 13); Black-billed Magpie, 5 (27, 11); Am. Robin, 5; Canada Goose, 4 (22, 9); Com. Grackle, 4; House Finch, 4; Mourning Dove, 3 (16, 7); N. Flicker, 3; Killdeer, 2; Barn Swallow, 1; Yellow Warbler, 1; Song Sparrow, 1. **Total:** 15 species; 75 territorial males or females (410/km², 166/100 acres). **Visitors:** Black-crowned Night-Heron, Belted Kingfisher, W. Meadowlark, Brewer's Blackbird. **Remarks:** Nests found: Canada Goose, Mallard, Red-winged Blackbird, and Song Sparrow. Plant identifications by Diana Mullineaux.—PHILIP HAYES, 42 S. Balsam St., Lakewood, CO 80226.

155. CAMPGROUND IN OLD ORCHARDS. — **Location:** Utah; Washington Co., Zion Nat'l Park, Watchman campground, loops A, B and C; 37°12'N, 113°00'W; Zion Nat'l Park Topographic Map (Zion Canyon Section), USGS. **Size:** 10.1 ha = 25 acres. **Continuity:** Established 1981; 3 consecutive years. **Description of Plot:** See AB 36:37 (1982). **Weather:** Good rainstorms on May 11 and July 6; temp. 3-5°F below average, except for July maxima. **Coverage:**

May 6, 14, 20, 26, June 2, 8, 12, 16, 24, July 2, 8, 15, 0600-0845, MDT. Total obs.-hours 23.5. **Census:** Am. Robin, 19 (188, 76), House Sparrow, 12 (119, 48); Black-headed Grosbeak, 8 (79, 32); N. Oriole, 8; Black-chinned Hummingbird, 7 (69, 28); Eur. Starling, 7; Solitary Vireo, 5 (49, 20); Yellow Warbler, 5; Warbling Vireo, 4 (40, 16), Brown-headed Cowbird, 4; Lesser Goldfinch, 4; Mourning Dove, 2; Hairy Woodpecker, 1, W. Wood-Pewee, 0.5; Black Phoebe, 0.5. **Total:** 15 species; 87 territorial males or females (860/km², 348/100 acres). **Visitors:** Violet-green Swallow, N. Raven, Cedar Waxwing, Virginia's Warbler, W. Tanager, Chipping Sparrow. **Remarks:** There was an increase of about 25% in the number of individuals over the previous 2 years, but a drop in the number of species. The cowbird total was the average number of females seen per trip. A family of N. Ravens, with 3 young, fed on the plot after the middle of June; they nested elsewhere. All other visitors were late migrants. Thanks to Merrill Webb and the following students for helping with the census: David Benson, Erik Davis, Angel Hayes, Ann Hillam, Priscilla Perkins, John Walter, Mike Whiting and Bruce and Ian Wingrove.—JEROME L. GIFFORD, P.O. Box 85, Springdale, UT 84767.

156. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — **Location:** Oregon; Grant Co., Bates, 1/4 mi E of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973; 11 consecutive years. **Size:** 32.38 ha = 80 acres. **Description of Plot:** See AB 27:1002-1003 (1973). **Weather 1982:** Temp. 28-58°F; clear on 7, cloudy on 2 censuses. Rainfall amounted to 1.6 in. during census period (June 24-July 31). Winter and spring precipitation was well above normal. Plot was 80% snow covered on first census and 5% snow covered by July 4th. **Coverage 1982:** June 24, 26, 29-30; July 4, 6, 10, 12, 15; 0443-0750 hrs, PDST. Total obs.-hours 14. **Census:** Chipping Sparrow, 12 (37, 15), Ruby-crowned Kinglet, 9 (28, 11); Cassin's Finch, 8 (25, 10); White-crowned Sparrow, 7 (22, 9); Am. Robin, 5 (15, 6); Yellow-rumped Warbler, 4 (12, 5); Fox Sparrow, 2; Lincoln's Sparrow, 2; Mountain Chickadee, 1; Mountain Bluebird, 1; Dark-eyed Junco, 1. **Total:** 11 species; 52 territorial males (161/km², 65/100 acres). **Visitors:** N. Flicker, Steller's Jay, Clark's Nutcracker, Red Crossbill, Pine Siskin. **Remarks:** Above normal snowpack may have affected ground nesters, i.e. Lincoln's and White-crowned Sparrows, but only slightly delaying actual nesting. During census period the area adjoining the plot was aerial sprayed for Spruce Budworm control with Sevin and this may have affected food supplies during the nesting season for the avian populations in the census area. **Weather 1983:** Temp. 30-66°F; clear on 7 and cloudy on 2 censuses. Rainfall amounted to 1.84 in during census period (June 23-July 31). Fall, winter and spring precipitation was well above

normal. Plot was 80% snow covered on first census and 10% snow covered by July 4th. **Coverage 1983:** June 23, 25, 28, 30; July 4-5, 10-12, 0438-0750 hrs, PDST. Total obs.-hours 14. **Census:** Chipping Sparrow, 13 (40, 16); Cassin's Finch, 9 (28, 11); Ruby-crowned Kinglet, 5 (15, 6); White-crowned Sparrow, 5; Am. Robin, 4 (12, 5); Yellow-rumped Warbler, 3 (9, 4); Dark-eyed Junco, 3; Fox Sparrow, 2; Spotted Sandpiper, 1; Mountain Bluebird, 1; Varied Thrush, 1. **Total:** 11 species; 47 territorial males ($145/\text{km}^2$, 59/100 acres). **Visitors:** Steller's Jay, Clark's Nutcracker, Mountain Chickadee, Pine Grosbeak, Pine Siskin: **Remarks:** Nest located: White-crowned Sparrow. Spotted Sandpipers returned to successfully breed after a 4-year absence. Pine Grosbeaks were encountered on over half the censuses though no territorial behavior was observed. There appeared to be an invasion of forest breeding birds with increased breeding of Dark-eyed Juncos and Varied Thrush. This could be the result of lack of a normal food supply of insects in the adjoining dense forest due to the aerial application of Sevin for Spruce Budworm control in 1982 I am grateful to the Malheur Nat'l Forest staff for their cooperation.—ROBERT A. HUDSON, P.O. Box 81, Bates, OR 97817.

157. RIVERINE WOODLAND WITH INTERMIXED SHRUBLANDS. — **Location:** California; San Diego Co., along the San Luis Rey River on the Wilderness Gardens Ecological Reserve located just S of Highway 76, about 10 mi NE of the junction of Highway 76 and I-15 between Marion and Agua Tibia Canyons; within the NE $\frac{1}{4}$ Sec. 36, and the mid-W $\frac{1}{2}$ Sec. 31, T9S, R2W and R1W, respectively, Pala Quadrangle, USGS. **Continuity:** New (1982). **Size:** 12.39 ha = 30.61 acres (irregularly shaped, following the winding stream course for about a mile, and measured by planimetry of aerial photo). **Description of Plot:** A band of mixed woodland with scattered stands and individuals of willow, Coast Live Oak, White Alder, cottonwood, and California Sycamore intermixed with large, more open areas of coastal sage scrub and chaparral. Shrubland elements included California Buckwheat, Snapdragon Keckiella, Chamise, Deerweed, California Scrub Oak and Laurel Sumac. The undercover was dense in wooded areas but was sparse along the river channel, sandbars and in the coastal sage-chaparral areas. The water course was up to 50 m wide and flowing water was present during the entire period. The stream is oriented NW-SE here. The general habitat types and vegetation were assessed along 601.5 m of transects. Low plant cover (below 6 ft) was analyzed using the line intercept method along the transects; number of tree stems and dbh of each were recorded over a 1203 m² (601.5 × 2 m) area; and tree canopy cover was estimated by measuring the diameter of each crown as trees were not in leaf at the time of analysis. The plot included approximately 39.2% mixed woodland, 17.6% shrubland, 13.2% oak woodland, 5.9% shrublands with oak overstory, 5% unvegetated

sandbar, 4.9% herbaceous to subshrubby riparian growth, 3% sparsely vegetated sandbar and 11.1% flowing water as determined by linear measurements along the transects. A total of 55 trees (185/acre) in 7 size classes (size class a, 0-1.5 in. dbh; b, 1.5-3; c, 3-6; d, 6-9; e, 9-15; f, 15-21; g, 21-27 in.) were encountered along the transects: Mexican Elder, a-17, b-1, c-5, d-2; White Alder, a-6, b-3; California Sycamore, a-1, c-2, d-1, e-3; Coast Live Oak, c-2, d-1, e-1; Black Cottonwood, d-2, f-1; Arroyo Willow, a-3; Scrub Oak, a-2, b-1; Fremont's Cottonwood, g-1. Two snags were recorded; g-2. The estimated percent canopy cover and tree stem densities were 83.9% and 8.9 stems/100 m² (360.5/acre) in mixed woodland and 64.6% and 1.9 stems/100 m² (77/acre) in oak woodland. The number of stems of woody plants in the sage-chaparral areas were counted along a 2 m × 141.4 m (282.8 m²) area. There were 49 (693/acre) California Buckwheat stems, 26 (372/acre) *Brickellia* spp., 18 (258/acre) Chamise, 10 (143/acre) California Sagebrush, 8 (115/acre) Deerweed, 8 California Scrub Oak, 7 (100/acre) Laurel Sumac, 4 (57/acre) White Sage, and 3 (43/acre) Snapdragon Keckiella. Thirty species contributed to the low ground cover which totalled 56.2% over the entire plot. The relative percent of the most abundant ground cover (based upon 100% total) was: *Bromus* spp., 42%; W. Poison-oak, 14.1%; California Mugwort, 5.8%; California Buckwheat, 5.3%; Snapdragon Keckiella, 2.9%; Mulefat, 2.4%; Giant Chain Fern, 1.9%; Wild Cucumber, 1.7%; wild oats (*Avena* spp.), 1.6%; W. Ragweed, 1.6%; California Sagebrush, 1.5%; Laurel Sumac, 1.5%; mustard, 1.2%; a jimsonweed (*Datura meteloides*), 1.2%; Annual Agoseris, 1.2%; Coast Live Oak, 1.1%; sprouting forbs, 3.7%. **Edge:** The woodland continues along the San Luis Rey River to the NW and SE; bounded by steep hillsides with coastal sage scrub and chaparral, by steep cliff faces along approximately 300 m of the NW side, and by fringing stands and scattered individuals of coast live oak. **Topography:** Gradual slope from about 580 ft on the SE to 500 ft on the NW. **Weather 1983:** All counts had early morning overcast, clearing by mid-count. Temp. range, 65-85°F, averaging about 72° during the surveys. Winds were negligible in the early mornings, but typically reached approximately 10 mph by the end of each count. **Coverage:** Apr. 5, 13, 27; May 3, 11, 18; June 16; 0700-1330. Total obs.-hours: 30.5. **Census:** House Wren, 36.5 (299, 121); Song Sparrow, 31.5 (258, 104); Eur. Starling, 18 (147, 60); Rufous-sided Towhee, 11 (90, 36); Black-chinned Hummingbird, 10.5 (86, 35); Plain Titmouse, 10.5; Lesser Goldfinch, 9 (74, 30); W. Wood-Pewee, 7.5 (61, 25); Bushtit, 7.5; Com. Yellowthroat, 7.5; Acorn Woodpecker, 7 (57, 23); Brown Towhee, 6.5 (53, 22); Ash-throated Flycatcher, 6 (49, 20); Hutton's Vireo, 5.5 (45, 18); Black Phoebe, 5 (41, 17); Anna's Hummingbird, 4.5 (37, 15); Scrub Jay, 4.5; W. Flycatcher, 4 (33, 13); White-breasted Nuthatch, 4; Brown-headed Cowbird, 4; Nuttall's Woodpecker, 3.5 (29, 12); Orange-crowned Warbler, 3.5; N. Flicker, 3 (25, 10);

Phainopepla, 3; Warbling Vireo, 3; Bewick's Wren, 2.5; Red-shouldered Hawk, 2; Mourning Dove, 2; Lawrence's Goldfinch, 2; Red-tailed Hawk, 1.5; W. Bluebird, 1.5; N. Oriole, 1.5; Am. Kestrel, 1; Virginia Rail, 1; Ground Dove, 1; Costa's Hummingbird, 1; Tree Swallow, 1; Yellow Warbler, 1; Rufous-crowned Sparrow, 1; House Finch, 0.5; Am. Goldfinch, 0.5; Black-shouldered Kite, +; Belted Kingfisher, +; Violet-green Swallow, +; N. Rough-winged Swallow, +; Canyon Wren, +; Rock Wren, +. **Total:** 47 species; 237.5 territorial males ($1946/\text{km}^2$, 787/100 acres). **Visitors:** (Numbers are maximum observed on any visit) Great Blue Heron, 1; Green-backed Heron, 1; Black-crowned Night-Heron, 2; Turkey Vulture, 3; Cooper's Hawk, 1; Golden Eagle, 3; California Quail, 5; Band-tailed Pigeon, 5; White-throated Swift, 25; Olive-sided Flycatcher, 1; Am. Crow, 6; N. Raven, 3; Wrentit, 4; Nashville Warbler, 6; W. Tanager, 3. **Remarks:** Nests found (14): Red-shouldered Hawk (2), Red-tailed Hawk (1), Am. Kestrel (1), N. Flicker (1), W. Flycatcher (1), Black Phoebe (1), Ash-throated Flycatcher (1), Plain Titmouse (1), White-breasted Nuthatch (1), Eur. Starling (3), Brown Towhee (1). Census efforts were hampered by high waters of the San Luis Rey River, which the plot parallels, caused by discharge from an upstream reservoir and may have seriously retarded the initial breeding attempts of many species that nest in low scrub cover or on the ground.—THOMAS A. SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.

158. UPLAND GRASSLAND. — **Location:** California; San Diego Co., Cuyamaca Rancho State Park, near $32^{\circ}55'N$, $116^{\circ}32'00''W$, Cuyamaca Peak Quadrangle, USGS. 1.2 km N of Granite Spring, 3.5 km E of State Highway 79. **Continuity:** New. **Size:** 10 ha = 24.7 acres (250 × 400 m, measured with plastic tape, sighted with compass). **Description of Plot:** Low, open grassland, total vegetative cover nearly 100% in spring and about 25% in other seasons. Community dominated by annual grasses and wildflowers (*Festuca megalura*, *Erodium cicutarium*, *Bromus tectorum*, *Trifolium albopurpureum*) and perennial herbs, grasses and few shrubs (*Cirsium tiogianum* 28%, *Eriogonum wrightii* 26%, *Wyethia ovata* 16%). **Edge:** Surrounded by similar vegetation on the N and S and by open oak woodland on the E and W. **Topography:** Nearly flat with a 1 m deep dry ravine running N-S. **Elevation:** 1524 m (5000 ft) **Weather:** 6.8-20°C, no precipitation. **Coverage:** Apr. 21, 27-28; May 20-21, 28; June 24, July 2; 0620-1200. Total obs.-hours: 20. **Census:** Horned Lark, 7.5 (75, 30); W. Meadowlark, 5 (50, 20); Lark Sparrow, 1.5. **Total:** 3 species; 14 territorial males ($140/\text{km}^2$, 5.7/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Am. Kestrel, Mourning Dove, N. Flicker, Say's Phoebe, N. Raven, W. Bluebird, Eur. Starling, N. Oriole. **Remarks:** This work was supported by the California Department of Parks and Recreation. Thanks to Steve Boyd, Jeri Hirshberg, Doug Hogan,

Karla Kramer, Lawrence LaPre, Harold Wier for assistance with the vegetation analysis.—
NANCY GILBERT, 702 Elevado, Vista, CA 92083.

159. WILLOW WOODLAND WITH PONDED AND CHANNELED WATER.

— **Location:** California; San Diego Co., on Camp Pendleton along the E side of the floodplain of the lower Santa Margarita River just N of the mouth of Pueblitos Canyon. Vandegrift Boulevard approaches within about 30 m of the plot at the NE corner; lower central portion of the lower $\frac{1}{2}$ of Section 26, T10S, R5W, Morro Hill Quad., USGS. **Continuity:** New (1982). **Size:** 10.6 ha = 26.2 acres (nearly rectangular, about 1400×815 ft, measured with tape and compass and checked with planimetry of a 1982 color aerial photo, scale 1:6000). **Description of Plot:** A broad belt of willow woodland and associated riparian habitats oriented roughly N-S along the E side of the floodplain which here is about 3000 ft wide. Ponded water and slowly moving water were present during the entire period. A narrow pond, about 75 ft wide and up to 5 ft deep, was located along the entire E boundary and continued along about $\frac{1}{4}$ of the N edge. Narrow (to about 6 ft wide max.) water-filled channels were located along $\frac{1}{2}$ of the S edge, into about the center of the plot from the mid-south edge, and into the plot for about 100 ft from the mid-north edge. General habitat types and vegetation were assessed along a total of 840 m of transect. Plant cover below 6 ft tall was analyzed by line intercept along the transects; stem counts of trees were taken in a 1680 m^2 ($840 \text{ m} \times 2 \text{ m}$) area; and canopy cover was assessed with 2 sightings through an ocular tube with crosshairs at each meter point (1 reading on each side of the transect tape) in woodland, such that 202 readings were taken along 100 m of transect through woodland. The plot included approximately 38.9% short willow woodland (less than 5 m tall), 22.8% herbaceous to sub-shrubby riparian growth, 15.1% riparian growth with intermixed scattered willows, 14.5% tall willow woodland, 7.9% ponded or channeled water, and 0.8% disturbed riparian growth as determined by linear measurements along the transects. A total of 716 trees (1725 per acre) was encountered along transects. There were 4 species of willow present in 6 size classes (class a, 0-1.5 in. dbh; b, 1.5-3 in.; c, 3-6 in.; d, 6-9 in.; e, 9-15 in.; f, 15-21 in.): Arroyo Willow, a-255, b-127, c-91, d-2, e-1; Gooding Willow, a-127, b-66, c-29, d-1, f-1; Hinds Willow, a-14, b-1; and Pacific Willow, a-1. A total of 5 snags was encountered: a-3, b-2. Average tree canopy cover and tree stem densities were 71.4% and $54/100 \text{ m}^2$ (2186/acre) in tall willow woodland; 68.9% and $71/100 \text{ m}^2$ (2874/acre) in short willow woodland; and 8.2% and $28/100 \text{ m}^2$ (1134/acre) in riparian with sparse willows. Low ground cover was contributed by 42 plant species and totaled 33.5% over the entire plot although factoring in low cover overlap yields a ground cover estimate of 213.8%. The 12 most abundant low ground cover plants contributed 89.2% of the total cover and the relative per-

cent of each (based on 100% total) was California Mugwort, 22.9%; Mulefat, 22%; mustard, 11.5%; Douglas Mulefat, 10.8%; Bristly Ox Tongue, 5.7%; Branching Phacelia, 3.2%; Lambs Quarter, 2.8%; Arroyo Willow, 2.7%; Hooker's Evening-Primrose, 2.6%; rush, 2.1%; Giant Reed, 1.8%; and Poison-Hemlock, 1.1%. **Edge:** Continuous floodplain and similar riparian habitat surrounds 3 sides; Vandegrift Boulevard is on the E with low hills beyond with grasslands and patches of coastal sage scrub. **Topography:** The floodplain is generally flat at an elevation of about 35 ft. An old dike, now heavily overgrown with herbaceous to sub-shrubby plants, rises to about 1-2 ft above the average ground elevation and courses along nearly the length of the plot N-S at about mid-plot. **1982: Weather:** Overcast and cool during 5 visits with light drizzle on 1; overcast at start to sunny by mid-count on 3. Temp. range, about $58\text{-}82^\circ\text{F}$. **Coverage:** Apr. 17, 29; May 3, 10, 18, 21, 25; June 1; 0530-1145 hrs. Total obs.-hours: 31.4. **Census:** Song Sparrow, 75 (707, 286); Com. Yellowthroat, 43 (406, 164); Am. Goldfinch, 15 (141, 57); Rufous-sided Towhee, 12 (113, 46); Bewick's Wren, 8 (75, 31); Yellow Warbler, 8; Yellow-breasted Chat, 8; Wrentit, 7 (66, 27); Bushtit, 6 (57, 23); Black-headed Grosbeak, 6; Brown-headed Cowbird, 5 females (47, 19); Am. Coot, 4 (38, 15); Swainson's Thrush, 4; Com. Moorhen, 3 (28, 11); Black-necked Stilt, 3; Mourning Dove, 3; Costa's Hummingbird, 3; Bell's Vireo, 3; Hutton's Vireo, 3; Green-backed Heron, 2; Anna's Hummingbird, 2; Black Phoebe, 2; Orange-crowned Warbler, 2; W. Meadowlark, 1.5; Mallard, 1; Cinnamon Teal, 1; Black-shouldered Kite, 1; California Quail, 1; Killdeer, 1; Am. Avocet, 1; Black-chinned Hummingbird, 1; Downy Woodpecker, 1; N. Flicker, 1; W. Wood-Pewee, 1; Am. Crow, 1; Blue Grosbeak, 1; N. Oriole, 1; Lesser Goldfinch, 1; Red-shouldered Hawk, 0.5; Nuttall's Woodpecker, 0.5; W. Flycatcher, 0.5; California Thrasher, 0.5; Warbling Vireo, 0.5; Pied-billed Grebe, +; Redhead, +; Willow Flycatcher, +; Plain Titmouse, +; House Wren, +; Brown Towhee, +; Red-winged Blackbird, +. **Total:** 50 species; 245 territorial males or females ($2311/\text{km}^2$, 935/100 acres). **Visitors:** (Number is maximum observed on any one visit) Eared Grebe, 2; Great Blue Heron, 1; Snowy Egret, 3; Black-crowned Night Heron, 5; White-faced Ibis, 9; N. Pintail, 3; N. Pintail \times Mallard, 1 male; Blue-winged Teal, 2; N. Shoveler, 2; Gadwall, 2; Bufflehead, 3; Ruddy Duck, 2; Turkey Vulture, 1; Greater Yellowlegs, 1; Least Sandpiper, 3; Long-billed Dowitcher, 43; Cliff Swallow, 46; Barn Swallow, 1; N. Raven, 1; Solitary Vireo, 2; Nashville Warbler, 2; Yellow-rumped Warbler, 3; Black-throated Gray Warbler, 2; Townsend's Warbler, 1; Hermit Warbler, 2; MacGillivray's Warbler, 2; Wilson's Warbler, 9; Red-winged Blackbird, 2. **Remarks:** Nests found (26): Am. Coot (3), Bushtit (3), Am. Goldfinch (3), Com. Moorhen (2), Black-necked Stilt (2), Bell's Vireo (2), Green-backed Heron (1), Black-shouldered Kite (1), California Quail (1), Killdeer (1), Am. Avocet (1), Am. Crow (1), Yellow Warbler (1), Com. Yellowthroat (1), Yellow-breasted Chat (1), Blue Grosbeak (1), Song Sparrow (1). — **RICHARD ZEMBAL and BRIAN DANIELS, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.**

SAGEBRUSH-YUCCA OF SOUTH-WESTERN KANSAS

The following 3 censuses were conducted on the Cimarron Nat'l Grassland to compare breeding bird populations in Sagebrush-yucca habitat that has been treated as well as untreated. The first grid was censused by Ports (Kans. Ornith. Bull., 31:17-21 [1980]) as an untreated habitat and had been sprayed for Sand Sagebrush the following year. Some re-growth of the sage has occurred. The second grid had been treated for both sagebrush and Soapwort by burning, prior to Ports' census. The third grid was established as an untreated grid, but unfortunately, was aerially sprayed after the first thorough censusing. The spraying had only marginal success in killing the sagebrush. During the time period of the censuses the temperature was below average, the rainfall was above average and the wind was about average.

Our thanks to the U.S. Dept. of Agriculture for allowing access to these grids. This study as well as a short grass prairie and a riparian woodland study elsewhere in the Breeding Bird Censuses, were an independent study with the Biology Dept., Baker Univ., Baldwin City, Kansas. My thanks to Roger L. Boyd for assistance in establishing the grids, vegetation analysis, and reviewing the manuscript.—**TIMOTHY C. WAGNER, Dept. of Biol. Sci., Fort Hays State Univ., Hays, KS 67601.**

160. HERBICIDE-TREATED SAGEBRUSH-YUCCA. — **Location:** Kansas, Morton Co., 3 mi E of Wilburton, E $\frac{1}{2}$ of SW $\frac{1}{4}$, Sec. 24, T34S, R40W; $37^\circ 04'N$, $101^\circ 42'W$, Rolla Quadrangle, USGS. **Continuity:** New. **Size:** 15 ha = 37.07 acres (3×5 ha, measured with tape). **Description of Plot:** Dominated by forbs (80%) as determined by 24.4 m^2 samples. The most abundant plant was Com. Sunflower (27%). Soapwort Yucca comprised 3.8% and Sagebrush 1.3%. Other major forbs were: *Cryptantha crassisepala* 15.3%, *Lepidium densiflorum* 8.5%, *Tradescantia occidentalis* 4.7%, *Plantago patagonica* 4.1%, *Corydalis curvisiliqua* 4.0%, *Chenopodium album* 2.2%, *Eriogonum annuum* 2.2%, *Erigeron bellidiastrum* 1.9%, *Oxytropis lambertii* 1.4%, *Abronia fragrans* 1.3%. Grasses were dominated by *Eragrostis trichodes*, 12.7%. Other major grasses were *Sporobolus cryptandrus* 5.1%, and *Aristida longiseta* 1.6%. There was 36% bare ground. **Edge:** Bordered on all sides by similar habitat. **Elevation:** 3400 ft. **Coverage:** May 28; June 4, 12, 19, 26; July 2, 0655-1030. Total obs.-hours: 6.75. **Census:** Cassin's Sparrow, 8 (53, 22); Lark Bunting, 4 (27, 11); Mourning Dove, 3 (20, 8), W

Meadowlark, 1; S. Ring-necked Pheasant, +, N Bobwhite, +. **Total:** 6 species, 16 territorial males ($110/\text{km}^2$, 45/100 acres). **Visitors:** W. Kingbird, Horned Lark, Cliff Swallow, Barn Swallow, Brown-headed Cowbird. **Remarks:** Sunflowers were less than 1 cm May 28 and 1 m July 2. Single Mourning Dove nest found.

161. BURNED SAGEBRUSH-YUCCA.

— Location: Kansas; Morton Co., 5.5 mi W of Elkhart. Middle $\frac{1}{3}$ of W $\frac{1}{2}$ Sec. 16, T35S, R43W. 37°00'N, 102°00'W, Midway SE Quadrangle, USGS. **Continuity:** New. **Size:** 15 ha = 37.07 acres (3×5 ha, measured with tape). **Description of Plot:** Fairly even distribution between forbs (53%) and grasses (47%), as determined by 24 4 m² samples. The 2 most abundant forbs were Annual Sunflower, 12.9% and Plains Yucca, 12.4%, with Sagebrush comprising 1.5%. Other major forbs were: *Cryptantha crassisepala* 6.2%, *Chenopodium album* 5.7%, *Descurainia pinnata* 3.1%, *Plantago patagonica* 2.7%, *Sphaeralcea coccinea* 1.9%, *Ambrosia psilostachya* 1.4%. Grasses were dominated by *Agropyron smithii*, 21%. Other major grasses were *Eragrostis trichodes* 20%, *Sporobolus cryptandrus* 3.4%, and *Bouteloua gracilis* 1.2%. There was 42% bare ground. **Edge:** Bordered on all sides by similar habitat. **Elevation:** 3680 ft. **Coverage:** May 28; June 4, 12, 18, 26; July 2; 0830-1230. Total obs.-hours 7.33. **Census:** Cassin's Sparrow, 8 (53, 22); Lark Bunting, 5 (33, 14); Grasshopper Sparrow, 4 (27, 11); W. Meadowlark, 4; Mourning Dove, 3 (20, 8); Com. Nighthawk, 1. **Total:** 6 species; 25 territorial males ($167/\text{km}^2$, 67/100 acres). **Visitors:** Ring-necked Pheasant, Killdeer, Horned Lark, Brown-headed Cowbird. **Remarks:** A single Com. Nighthawk nest was found.

162. UNTREATED SAGEBRUSH-YUCCA.

— Location: Kansas; Morton Co., 6.5 mi W of Elkhart. Middle $\frac{1}{3}$ of W $\frac{1}{2}$ Sec. 17, T35S, R43W, 37°00'N, 102°00'W, Midway SE Quadrangle, USGS. **Continuity:** New. **Size:** 15 ha = 37.07 acres (3×5 ha, measured with tape). **Description of Plot:** Fairly even distribution between forbs (46.5%) and grasses (53.5%), as determined by 24 4 m² samples. The most abundant forb was Sagebrush (16.3%) with Plains Yucca comprising 1.9%. Other major forbs were: *Cryptantha crassisepala* 9.6%, *Chenopodium album* 6.4%, *Plantago patagonica* 4.3%, *Corydalis curvisiliqua* 1.4%, *Ambrosia psilostachya* 1.2%, *Helianthus annus* 1.0%, *Machaeranthera pinnatifida* 0.9%. Grasses were dominated by *Sporobolus cryptandrus*, 19.6%. Other major grasses were *Agropyron smithii* 18.3%, *Eragrostis trichodes* 12.3%, and *Bouteloua gracilis* 1.6%. There was 32% bare ground. **Edge:** Bordered on all sides by similar habitat. **Elevation:** 3650 ft. **Coverage:** May 29; June 4, 12, 18, 26; July 2, 0715-1140. Total obs.-hours 9.33. **Census:** Cassin's Sparrow, 10 (67, 27); Lark Bunting, 10; Mourning Dove, 3 (20, 8); Grasshopper Sparrow, 3; W. Meadowlark, 3; Brewer's Sparrow, 2; Horned Lark, +. **Total:** 7 species; 31 territorial males

(207/km², 84/100 acres) **Visitors:** Swainson's Hawk, Com Nighthawk, W Kingbird, Com. Grackle, Brown-headed Cowbird. **Remarks:** This was the grid that was sprayed for Sagebrush control, with only marginal success. Nests found: Cassin's Sparrow (1), Lark Bunting (3). The Bewer's Sparrows were not seen after spraying.

163. CHAMISE CHAPARRAL.

— Location: California; San Diego Co., Cuyamaca Rancho State Park, 32°54'N, 116°34'W, Cuyamaca Peak Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres, (300 × 333 m, measured with steel tape, sighted with compass). **Description of Plot:** Dense chaparral; total vegetative cover varies from 90% to over 100%. The plant community is dominated by Chamise 46%, *Ceanothus greggii* 13%, and California Scrub Oak 11%. Other common shrubs include manzanita (*Arctostaphylos pungens* and *A. glandulosa*) and White Sage. There are very few herbaceous species (representing less than 1% cover). These include Fairy Lantern and Purple-heads. Running through the plot is a broad area (~50 m wide) dominated by White Sage and Deerweed. Vegetative cover was determined by averaging three 50 × 2 m belt transects. **Edge:** Surrounded by similar vegetation on all sides. **Topography:** South-facing slope generally exceeds 25%. **Elevation:** 4400 ft. **Weather:** Temp. 6.8-20°C, no ppt. **Coverage:** Apr. 21, 23, 29; May 13-14; June 4, 9. Total obs.-hours: 16. **Census:** Rufous-sided Towhee, 13 (130, 53), Wrentit, 11 (110, 45), Scrub Jay, 8 (80, 32); Anna's Hummingbird, 7 (70, 28); Black-chinned Sparrow, 6; Dark-eyed Junco, 6 (60, 24); Mountain Quail, 4 (40, 16); Bushtit, 4; California Thrasher, 3.5 (35, 14); Bewick's Wren, 2; Brown Towhee, 2; Lesser Goldfinch, 2; Ash-throated Flycatcher, 1.5; N. Flicker, 1; Plain Titmouse, 1; Black-headed Grosbeak, 1; House Wren, 0.5. **Total:** 17 species; 73.5 territorial males ($735/\text{km}^2$, 298/100 acres). **Visitors:** Turkey Vulture, Golden Eagle, Olive-sided Flycatcher, N. Raven. **Remarks:** This work was supported by the Calif. Dept. of Parks and Recreation. Thanks to Steve Boyd, Larry LaPre, Harold Wier, Nancy Gilbert, and Doug Hogan for assistance with the vegetation analysis.—KARLA KRAMER, 2803 Iron Hills Way, Riverside, CA 92506.

164. CHAPARRAL WITH CANYON-BOTTOM WOODLAND.

— Location: California; San Diego Co., above the N bank of the Santa Margarita River. The SW edge is about 0.5 mi E of the mouth of Sandia Creek; mostly within the NE $\frac{1}{4}$ of Section 7, T9S, R3W (a small part is in the NW $\frac{1}{4}$ of Section 7), Temecula Quad., USGS. **Continuity:** New (1982). **Size:** 24.08 ha = 59.5 acres (irregular shape but very roughly rectangular and about 2500 × 1035 ft, measured with tape and compass and checked with planimetry of a 1:6000 scale color aerial photo—1982). **Description of Plot:** The shrublands line the NW- and SE-facing slopes of a small canyon that courses perpendicular to the Santa

Margarita River. The chaparral continues over a low hill and onto a second NW-facing slope on the NW corner. Woody chaparral covers much of the NW-facing slopes, whereas a lower growing and more open "soft" chaparral grows on the SE-facing slope and onto the top of the lower ridge. The "soft" chaparral vegetates about 1/5 of the plot with dominant Chamise and Deerweed. The canyon bottom vegetation is dominated by large, mostly widely spaced, Coast Live Oaks with an occasional California Sycamore, and abundant low growing willows, mostly Arroyo Willows. The canyon bottom woodland is continuous along the length of the plot, but the continuity is contributed by the willows with breaks between the oaks and sycamores. The woodland belt varies from about 10-20 m in width with a usual maximum breadth of only 2 oaks. At the lower end of the canyon bottom there is a grove of about 15 oaks at the SW tip of the plot. Disused dirt roads run along the upper (SE) ridge and the top of the low hill with very overgrown spur roads that course diagonally along both NW-facing slopes. The composition of vascular plants in the shrublands was assessed with a total of 660.9 m of line intercept analysis for ground cover and 1139.4 m² (569.7 m × 2 m) of belt transect for woody stem counts along 2 transects run perpendicular to the canyon bottom. Total ground cover by vascular plants was 92.6% and total cover contributed by woody species was 63.7%; 60 species of plants were encountered along the transects. The 10 dominant woody plants were (after each species is % of 63.7% total woody cover contributed by that species followed in parentheses by stems per acre): California Lilac, 25% (954); Chamise, 23.9% (769); Deerweed, 10% (274); Mission Manzanita, 9.9% (274); California Buckwheat, 7.6% (278); California Scrub Oak, 7.1% (174); S. Honey-suckle, 3% (50); Com. Hazardia, 2.9% (125); Big-berried Manzanita, 2% (25); and Toyon, 1.8% (18). The dominant, mostly lower-growing, ground cover included grasses, vines, and forbs such as (percents are based upon 100% for all cover including woody plants) Brome Grasses (*Bromus spp.*), 14.6%; Desert Grape, 2.9%; Tocalote, 2%; Bird's-beak, 1.8%; wild oats (*Avena spp.*), 1.6%; Cat's Ear, 1.4%; Wild Cucumber, 1.3%; and Poison Oak, 1%. **Edge:** Similar habitat borders most of 3 sides, with an avocado ranch along about $\frac{1}{3}$ of the N edge. Riparian woodland with abundant willows along the river and a small side creek border the W edge and SW tip of the plot. **Topography:** The slope is relatively steep from the canyon bottom at 360-500 ft to the upper ridge (SE edge of plot) at 400-600 ft. The lower hill on the opposite side of the canyon bottom peaks at about 520 ft and slopes down to the NW to a lowest point of about 360 ft. The average slope is about 44%. **Weather 1982:** Overcast and cool on 6 visits with light intermittent drizzle on 3. Overcast at start to hot and sunny by the mid-to-late census on a total of 3 visits. Temp range, about 58-75°F. **Coverage:** May 5, 7, 12, 18, 20, 25, 27; June 1; 0620-1130 hrs. Total obs.-hours: 29.1. **Census:** Wrentit, 24 (100, 40); Rufous-sided Towhee, 17 (71, 29); Brown Towhee, 15 (62, 25); Bewick's Wren,

13 (54, 22), Rufous-crowned Sparrow, 11 (46, 18), California Quail, 10 (42, 17), Bush-tit, 7 (29, 12); California Thrasher, 6.5 (27, 11); Black-chinned Hummingbird, 6 (25, 10); Anna's Hummingbird, 6; Lesser Goldfinch, 5.5 (23, 9); Scrub Jay, 5 (21, 8); Com. Poor-will, 4 (17, 7); Costa's Hummingbird, 3 (12, 5); Ash-throated Flycatcher, 3; House Wren, 2.5; Song Sparrow, 2.5; House Finch, 2; Mourning Dove, 1.5; Plain Titmouse, 1.5; Greater Roadrunner, 1; N. Flicker, 1; W. Wood-Pewee, 1; Orange-crowned Warbler, 1; Blue-gray Gnatcatcher, 0.5; Com. Yellowthroat, 0.5; Yellow-breasted Chat, 0.5; Hutton's Vireo, 0.25; Lark Sparrow, 0.25; Phainopepla, +; Black-headed Grosbeak, +; Lazuli Bunting, +. **Total:** 32 species; 152 territorial males or females ($631/\text{km}^2$, 255/100 acres). **Visitors:** (Number is maximum individuals observed on any single visit) Cedar Waxwing, 50; Cliff Swallow, 21; N. Rough-winged Swallow, 17; N. Raven, 4; Cassin's Kingbird, 3; Lawrence's Goldfinch, 3; Am. Goldfinch, 3; White-throated Swift, 2; Turkey Vulture, 1; Cooper's Hawk, 1; Red-tailed Hawk, 1; Yellow-rumped Warbler, 1; Wilson's Warbler, 1. **Remarks:** Nests found (10): Wrentit (2), Brown Towhee (2), Lesser Goldfinch (2), Scrub Jay (1), Bushtit (1), Bewick's Wren (1), Rufous-crowned Sparrow (1). The study was funded by the U.S. Fish and Wildlife Service, Ecological Services Office, Laguna Niguel, California, and the U.S. Bureau of Reclamation, Boulder City, Nevada.—*RICHARD ZEMBAL and THOMAS SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Rd., Laguna Niguel, CA 92677.*

165. COASTAL SAGE SCRUB (BUCK-WHEAT DOMINATED). — **Location:** California; San Diego Co., Escondido, N of Via Rancho Pkwy., W of I-15; 33°04'30"N, 117°04'15"W, Escondido Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 37:94-95 (1983). **Weather:** A cool, moist spring. **Coverage:** Mar. 6, 13, 20, 27; Apr. 2, 17, 23; May 1, 8, 14, 22, 30; June 12; 0435-1355, PST. Total obs.-hours: 13. **Census:** Brown Towhee, 8 (99, 40); Bushtit, 5 (62, 25); Black-tailed Gnatcatcher (race *californica*), 4 (49, 20); Rufous-sided Sparrow, 3 (37, 15); California Quail, 2.5; Anna's Hummingbird, 2 males; Wrentit, 2; Rufous-sided Towhee, 2; California Thrasher, 1.5; Greater Roadrunner, 1; Costa's Hummingbird, 1 male; Sage Sparrow, 1; W. Meadowlark, 0.5; Black-shouldered Kite, +; Song Sparrow, +. **Total:** 15 species; 33.5 territorial males ($414/\text{km}^2$, 168/100 acres). **Visitors:** Am. Kestrel, Cassin's Kingbird, Bewick's Wren, N. Oriole, House Finch, Lesser Goldfinch. **Remarks:** Nests found: Bushtit (4), Black-tailed Gnatcatcher (3). All Bushtit nests were built in Coastal Sagebrush (*Artemesia californica*). Sage Sparrow decreased by 2 males from last spring for the most notable change. The W. Meadowlark frequented a fire break cleared last summer near the E border.—*KENNETH L. WEAVER, 1339 Taylor Place, Escondido, CA 92027.*

166. COASTAL SAGE SCRUB (SAGE DOMINATED). — **Location:** California, San Diego Co., Escondido, N of Via Rancho Pkwy., W of I-15; 33°04'30"N, 117°04'30"W, Escondido Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 37:95 (1983). **Weather:** See Census 165. **Coverage:** Mar. 6, 13, 20, 27; Apr. 2, 17, 23; May 1, 8, 14, 22, 30; June 12; 0510-1455, PST. Total obs.-hours: 15. **Census:** Brown Towhee, 8 (99, 40); Rufous-crowned Sparrow, 6 (74, 30); Costa's Hummingbird, 4 males (49, 20); Black-tailed Gnatcatcher (race *californica*), 4; Wrentit, 4; Rufous-sided Towhee, 4; Bush-tit, 3 (37, 15); Lesser Goldfinch, 3; Anna's Hummingbird, 2 males; California Thrasher, 2; Lazuli Bunting, 2; California Quail, 1; Mourning Dove, 1; Song Sparrow, 1; Black-shouldered Kite, +. **Total:** 15 species; 45 territorial males ($556/\text{km}^2$, 225/100 acres). **Visitors:** Cassin's Kingbird, Scrub Jay, Bewick's Wren, N. Mockingbird, N. Oriole, House Finch, Lawrence's Goldfinch. **Remarks:** Nests found: Mourning Dove, (1) on ground, Costa's Hummingbird (1), Bushtit (4), Black-tailed Gnatcatcher (2), Brown Towhee (1), Rufous-crowned Sparrow (1), Lesser Goldfinch (3). Goldfinches nested exclusively in Black Sage (*Salvia mellifera*). Their presence as nesters was the most notable change from last year, as at that time they appeared to be only occasional visitors.—*KENNETH L. WEAVER, 1339 Taylor Place, Escondido, CA 92027.*

167. COASTAL SAGE SCRUB-LIVE OAKS. — **Location:** California; San Diego Co., on Camp Pendleton above the W bank of the Santa Margarita River, S tip of plot is about 0.34 mi NE of intersection of Camp Deluz and Santa Margarita (dirt) Roads; mostly within NE 1/4 Sec. 29, T9S, R4W, Morro Hill Quad., USGS. **Continuity:** New (1982). **Size:** 17.04 ha = 42.1 acres (roughly rectangular, 2900 × 630 ft, measured with tape and compass and planimetry of a 1:6000 scale color aerial photo—1982). **Description of Plot:** The shrublands are on an intermittently steep E-facing slope above the W bank of the Santa Margarita River on a peninsula of land that separates Deluz Creek and the River near their confluence. The longer axis runs parallel to the River. The composition of perennial plants and lower growing ground cover was assessed from a total of 559.7 m of line intercept analysis for ground cover and 1119.4 m² of belt transect for woody stem counts (559.7 × 2 m wide) along 4 randomly placed transect lines run perpendicular to the River. Total ground cover was 95.7% and total cover contributed by woody species was 81.8%; 37 species of vascular plants were encountered along the transects. The 10 dominant woody plants were (after each species is % of 81.8% total woody cover contributed by that species followed in parentheses by stems/acre): California Sagebrush, 38.5% (1,113); California Buckwheat, 19.8% (576); Deerweed, 15.2% (474); White Sage, 9.6% (268); Laurel Sumac, 8.3% (62); Coast Live Oak, 3.1%; Bush Mallow, 1.9% (29); Climbing Bedstraw, 1.1%; Desert

Grape, 0.9%; Mexican Elder, 0.8%. The actual total number of arborescent plants were counted and there were: 406 Laurel Sumac (9.6/acre), 70 Coast Live Oaks (1.7/acre), 12 Mexican Elder (0.29/acre), 12 California Buckthorn (0.29/acre), and 2 Hollyleaf Cherry (0.05/acre). The dominant low-growing ground cover were grasses, including *Bromus* spp., 11.52% (% based upon 100% for all cover including woody plants); wild oats (*Avena* spp.), 7.49%; Needle Grasses (*Stipa* spp.), 3.47%; and Nit Grass (*Gastridium ventricosum*), 0.49%. Other important forbs included tarweeds, 1.92%; Doveweed, 1.04%; Tocalote, 0.75%; Rattlesnake Weed, 0.53%; Winecup Clarkia, 0.4%; Cat's Ear, 0.26%, and a dodder (*Cuscuta californica*), 0.26%. The oaks were widely scattered in draw-bottoms and somewhat more concentrated along the river-ward edge. **Edge:** Similar habitat occurs on 3 sides. Riparian vegetation with dominant willows borders the E side. **Topography:** Slopes steeply from the river's edge at about 160 ft (lowest point) to a broad ridge top at about 300 ft. The highest point is near the NE corner at about 360 ft. The average slope is about 38%. **Weather 1982:** Overcast at the beginning, but usually clear and sunny by mid- to late census. Intermittent light drizzle on 1 count. Temp. range, about the mid-fifties to about 75°F. **Coverage:** Apr. 30; May 3, 5, 13, 19, 23; June 2-3; 0645-1145 hours Total obs.-hours: 27.3. **Census:** Wrentit, 25 (147, 59); Rufous-sided Towhee, 15 (88, 36), Rufous-crowned Sparrow, 15; Brown Towhee, 14 (82, 33); Costa's Hummingbird, 8 (47, 19), House Wren, 5 (29, 12); Anna's Hummingbird, 4 (23, 10); California Quail, 3 (18, 7), Scrub Jay, 3; Bushtit, 3; Bewick's Wren, 3, California Thrasher, 3; Com. Yellowthroat, 3, Lesser Goldfinch, 3; W. Meadowlark, 2.5, Black-chinned Hummingbird, 2; Phainopepla, 2; Lazuli Bunting, 2; Brown-headed Cowbird, 2; Mourning Dove, 1; Acorn Woodpecker, 1; Ash-throated Flycatcher, 1, Song Sparrow, 1; Grasshopper Sparrow, 0.25, House Finch, 0.25; Yellow-breasted Chat, +, N. Oriole, +. **Total:** 27 species; 122 territorial males or females ($716/\text{km}^2$, 290/100 acres). **Visitors:** (Number is maximum individuals observed on any single visit). Vaux's Swift, 21; Cliff Swallow, 20; N. Rough-winged Swallow, 6; Cedar Waxwing, 6; Barn Swallow, 3; Wilson's Warbler, 3; Black-shouldered Kite, 2; Red-shouldered Hawk, 2, White-throated Swift, 2; Orange-crowned Warbler, 2; Red-winged Blackbird, 2; N. Oriole, 2; Am. Goldfinch, 2; Belted Kingfisher, 1; Nuttall's Woodpecker, 1; N. Flicker, 1; N. Raven, 1; Plain Titmouse, 1; Hutton's Vireo, 1. **Remarks:** Nests found (14): Bushtit (3), Black-chinned Hummingbird (2), Costa's Hummingbird (2), Bewick's Wren (2), House Wren (1), Phainopepla (1), Brown Towhee (1), Rufous-crowned Sparrow (1), Lesser Goldfinch (1). The study was funded by the U.S. Fish and Wildlife Service, Ecological Services Office, Laguna Niguel, California and the U.S. Bureau of Reclamation, Boulder City, Nevada.—*RICHARD ZEMBAL, BRIAN DANIELS, and TOM SCOTT, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92677.*

168. SHRUBBY SWAMP AND SEDGE HUMMOCKS.

— Location: Connecticut; Litchfield Co., N end of Bantam Lake, White Memorial Foundation, Litchfield; 41°43'20"N, 73°12'27"W. Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 17 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 19:625-627 (1965). **Coverage:** June 8, 13-15; 0445-2200 hrs. Total obs.-hours: 18. **Census:** Swamp Sparrow, 40 (494, 200); Red-winged Blackbird, 36 (445, 180); Yellow Warbler, 23 (284, 115); Willow Flycatcher, 8 (99, 40); Virginia Rail, 6 (74, 30); Marsh Wren, 5 (62, 25); Com. Yellowthroat, 5; E. Kingbird, 4 (49, 20); Mallard, 3 (37, 15); Wood Duck, 2; Cedar Waxwing, 2; Song Sparrow, 2; Brown-headed Cowbird, 2; Am. Goldfinch, 2; Gray Catbird, 1.5; Least Bittern, 1; Am. Black Duck, 1; Green-backed Heron, 0.5; Great Crested Flycatcher, 0.5; Chestnut-sided Warbler, 0.5; Great Blue Heron, +; Green-winged Teal, +; Blue-winged Teal, +; Black-billed Cuckoo, +; Veery, +; Yellow-throated Vireo, +; Rose-breasted Grosbeak, +; N. Oriole, +. **Total:** 28 species, 145 territorial males (1791/km², 725/100 acres). **Remarks:** No great flood this year as in 1979 and 1982. The number of territorial males was however a little below average. Perhaps it takes 2 years for a full recovery from a disastrous flood. High water in recent years has inhibited the higher growth of vegetation and thereby reduced total cover and feeding for passerines. Marginal species based on marginal habitat have been reduced or eliminated. Least Bittern is new. Locally very rare, this bird was highly vocal and probably mateless. An old beaver lodge that Canada Geese formerly nested on has worn away. More open water in the interior of the plot is evident, providing night roosts for Mallards, Am. Black Ducks, and single male Blue-winged and Green-winged teals. Broods of Mallard, Wood Duck and Am. Black Duck were seen. Alder Flycatchers have been a marginal-habitat species in decline for years, and this year none were heard. This year, a pair of E. Bluebirds inspected stubs and moved on.—*ANDREW MAGEE, 34 Hobson St., Springfield, MA 01109.*

169. CAT-TAIL-BULRUSH SWAMP.

— Location: New Jersey; Morris Co., 1 mi E of Basking Ridge, Great Swamp Nat'l Wildlife Refuge; 40°41'N, 74°32'W. Bernardsville Quadrangle, USGS. Waterfowl Management Unit No. 2. **Continuity:** Established 1980; 4 consecutive years. **Size:** 5.87 ha = 14.5 acres. **Description of Plot:** See AB 35:98 (1980). **Weather:** Average temp. for May was 54°F (28-80°). Total rainfall was 6.37 in. Average temp. for June was 66°F (38-93°). Total rainfall was 4.85 in. **Coverage:** May 10, 12, 17, 24, 26, 31; June 9; 0550-0710 hours. Total obs.-hours: 6. **Census:** Marsh Wren, 16 (273, 110); Swamp Sparrow, 10 (170, 69); Red-winged Blackbird, 10. **Total:** 3 species; 36 territorial males (613/km², 248/100 acres). **Visitors:** Am. Bittern, Least Bittern, Great Blue Heron, Green-backed Heron, Mourning Dove, Tree Swallow, Barn Swallow, Blue

Jay, Am Crow, Yellow Warbler, Com. Yellowthroat, Bobolink.—*HAROLD LASKOWSKI and GRAHAM W. TAYLOR (compiler), Great Swamp National Wildlife Refuge, USDI, Fish and Wildlife Service, R.D. #1, Box 152, Basking Ridge, NJ 07920.*

170. GULF COAST SALT MARSH.

— Location: Florida; Levy Co., 6 km NNW of Cedar Key, a marsh bounded on SW by Prodigy Creek, on the S by Live Oak Key and the Gulf of Mexico (Waccasassa Bay) and on the N by Dorset Creek; 29°11'N, 83°00'W. Cedar Key Quadrangle, USGS. **Continuity:** Established 1980; 4 consecutive years. **Size:** 15 ha = 37.07 acres. **Description of Plot:** See AB 35:99, 104 (1980). **Weather:** Mostly clear days, 7-38°C. **Coverage:** Jan. 28; Feb. 4, 12, 18, 25; Mar. 4, 6, 13, 20, 25, 27-29; Apr. 1-3, 5, 10-14, 17, 22, 25-26, 29-30; May 1, 3-4, 6-8, 10-12, 14-15, 17-19, 22-27, 29, 31; June 1-3, 5, 7, 11, 13, 28-29; July 2, 9, 16, 23, 30; Aug. 23. Total obs.-hours: 374. **Census:** Seaside Sparrow, 30 (200, 81); Clapper Rail, 9 (60, 24); Marsh Wren, 4 (27, 11). **Total:** 3 species; 43 territorial males (287/km², 116/100 acres). **Visitors:** Am. White Pelican, Brown Pelican, Double-crested Cormorant, Great Blue Heron, Great Egret, Snowy Egret, Tri-colored Heron, Little Blue Heron, Cattle Egret, Green-backed Heron, Yellow-crowned Night Heron, White Ibis, Turkey Vulture, Osprey, N. Harrier, Virginia Rail, Sora, Black-bellied Plover, Greater Yellowlegs, Lesser Yellowlegs, Willet, Sanderling, Least Sandpiper, Dunlin, Short-billed Dowitcher, Laughing Gull, Ring-billed Gull, Royal Tern, Forster's Tern, Belted Kingfisher, Barn Swallow, Fish Crow, Sharp-tailed Sparrow, Bobolink, Red-winged Blackbird. **Remarks:** Observations on the breeding biology of these birds continues to be made in conjunction with research on Seaside Sparrow vocalizations. As in the previous 3 years, almost all of the adult Seaside Sparrows were individually color banded. The unusually cool, wet, and late spring of this year had a definite effect on the breeding activity of the Seaside Sparrows (those birds of the 3 breeding species most carefully monitored). In general, the breeding activity was delayed 4-5 weeks, as compared to previous years. The first nest was not found until Apr. 26 this year (although it is probable nesting attempts were made previous to this). The last nest fledged June 28. There were 2 major floods; on April 2 and 9. Any nesting attempts prior to these dates would have been wiped out by high waters. The reproductive rate of those 23 pairs of Seaside Sparrows was very low, because of the combined effects of the inclement weather and the traditionally high predation rate on nests. In addition to the Rice Rat and Fish Crow predation, I suspect that Raccoons (*Procyon lotor*) are a major nest predator on this marsh. In a previous report (AB 37:100) I mentioned that there were no known "floater" males in this population of Seaside Sparrows. However, based on this year's observation, I now have evidence to the contrary; there were indeed adult male "floaters" lurking around the edges of established

territories. As contrasted to previous years, the Marsh Wrens were mated and fledged young.—*MARY VICTORIA McDONALD, Dept. of Zoology, Univ. of Florida, Gainesville, FL 32611.*

171. GULF OF MEXICO BARRIER ISLAND.

— Location: Florida; Franklin Co., St. Vincent Island (St. Vincent Nat'l Wildlife Refuge), SE tip of island, bordering West Pass; 29°38'N, 85°06'W. West Pass Quadrangle, USGS. **Continuity:** New. **Size:** 51.4 ha = 127 acres (4-sided, measured on a 1:2400 scale air photo). **Description of Plot:** This representative sample of a N Gulf barrier island includes about 3.4 ha (= 8.4 acres) of beach, 14.8 ha (= 36.6 acres) of overwash savannah, 16.1 ha (= 39.8 acres) of maritime forest, 12.6 ha (= 31.1 acres) of insular Slash Pine forest, and 4.5 ha (= 11.1 acres) of fresh to sometimes brackish marsh. A tidal stream flows through the plot and empties into the Gulf of Mexico at West Pass. There is a house, barn and equipment compound covering about 2 ha (= 4.9 acres) situated in one corner. The plot is crossed by several infrequently used jeep trails. The beach is mainly unvegetated but has scattered patches of Sea Oats (*Uniola paniculata*) and the morning glory *Ipomoea pes-caprae*. The overwash savannah has a few small colonizing specimens of Slash Pine and Rattlebox; otherwise, the knee-high ground cover includes the grasses *Muhlenbergia*, *Schizachyrium*, *Spartina patens*, *Sporobolus*, *Distichlis spicata* and *Cenchrus* and forbs. *Smilax bona-nox*, *Hypericum hypericoides* and *Conradina canescens* are also present. Feral pigs (*Sus scrofa*) have dug holes over much of the overwash savannah. The maritime forest is dominated by Live Oak, Sand Live Oak, Laurel Oak, and Cabbage Palmetto. Important understory components include Saw-palmetto, Yaupon, Muscadine, Wax-Myrtle, and Tree Sparkleberry. The forest floor is continuously and extensively uprooted by the large population of feral pigs. Small depressions are maintained as mud wallows, and few plants grow under the oaks where pigs root for acorns. A quantitative survey (10 randomly-placed 0.1 acre circular samples) of the vegetation in the maritime forest portion of the BBC plot gave the following results: Trees 3 in. diameter and over, 262/acre; total basal area 101.5 ft²/acre. Species ($\geq 3"$ dbh) comprising 93% of the total number of trees: Cabbage Palm, 107, 41, 40, 100; Live Oak, 84, 32, 27, 100; Slash Pine, 30, 11, 11, 70; dead trees, 12, 5, 1, 40; Laurel Oak, 11, 4, 3, 40. Trees by diameter size class: A (3-6 in.) 41, 16, 1.7, 2; B (6-9 in.) 47, 18, 7.1, 7; C (9-15 in.) 151, 58, 60.4, 59; D (15-21 in.) 18, 7, 16.2, 16; E (21-27 in.) 2, 1, 3.2, 3; F (27-33 in.) 2, 1, 4.9, 5; G (33-40 in.) 1, 0.4, 8, 8. Shrub and sapling stems/acre, 1105; ground cover, 24%; canopy cover, 81%; average canopy height, 20 ft (range 10-25). The Slash Pine forest, dominated by naturally occurring Slash Pine trees, Cabbage Palmetto, and E. Redcedar is an unusual habitat type that owes its existence to the relative rarity of ground fire on islands. Important subcanopy species

include Yaupon, Wax myrtle, E Baccharis, and Saw-palmetto. Much of the ground is covered with a layer of pine needle duff up to 18 in. deep in places. Important ground-level plants include sedges in the genera *Carex*, *Dichromena*, *Eleocharis*, and *Fimbristylis*, the grass *Setaria* and the composites *Eupatorium mikanoides* and *Pluchea odorata*. Other important forbs include *Centella asiatica*, *Plantago virginica*, *Diadisia virginiana*, *Cirsium horidulum*, *Rhexia lutea*, and *Sabatia*. The grapes *Vitis rotundifolia* and *V. aestivalis*, and *Smilax* sp., Pepper-vine, Virginia Creeper, Poison Ivy and Climbing Hempweed are common vines in the Slash Pine type. A quantitative survey (10 randomly-placed 0.1 acre circular samples) of the vegetation in the Slash Pine forest portion of the BBC plot gave the following results: Trees 3-in. diameter and over, 330/acre; total basal area 79.6 ft²/acre. Species (\geq 3 in. dbh) comprising 90% of the total number of trees: Slash Pine, 248, 75, 75, 100; Cabbage Palm, 25, 8, 20, 70; E. Redcedar, 23, 7, 2, 70. Trees by diameter size class: A (3-6 in.) 138, 42, 6, 9, 9; B (6-9 in.) 82, 25, 12, 3, 15; C (9-15 in.) 83, 25, 33, 2, 42; D (15-21 in.) 24, 7, 21, 6, 27; E (21-27 in.) 2, 1, 3, 1, 4; F (27-33 in.) 1, 0, 3, 2, 5, 3. Shrub and sapling stems/acre, 1215; ground cover 49%; canopy cover 48%; average canopy height 33 ft (range 25-40). The marsh habitats are mostly small patches along the creek and in depressions on the overwash savannah; the largest freshwater marsh covers 2.4 ha and is dominated by Sawgrass (*Cladium jamaicense*) and Black Rush (*Juncus roemerianus*), with a few scattered clumps of E. Baccharis. Mallow *Kosteletzky* and morning glory (*I. sagittata*) are also present. **Edge:** Two sides of the plot, totalling 4800 ft, are bordered by the Gulf of Mexico (West Pass and Apalachicola Bay); about 4000 ft of the perimeter are bordered by maritime forest; about 1000 ft by island Slash Pine forest, and about 800 ft by overwash savannah. **Topography:** Gentle ridge and swale. **Elevation:** 0-8 ft. **Weather:** Normal. **Coverage:** Apr. 22-May 28; sunrise-0900 and 1700-2200. Total obs.-hours: 42. **Census:** Blue-gray Gnatcatcher, 11 (21, 9); N. Parula, 7 (14, 6); Carolina Wren, 6 (12, 5); Pine Warbler, 6; Brown-headed Cowbird, 6; N. Cardinal, 4 (8, 3); Chimney Swift, 3 (6, 2); Red-bellied Woodpecker, 3; Yellow-throated Warbler, 3; Com. Yellowthroat, 3; Summer Tanager, 2; Great Crested Flycatcher, 1.5; Wild Turkey, 1; Purple Gallinule, 1; Chuck-will's-widow, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; E. Kingbird, 1; Carolina Chickadee, 1; Blue Grosbeak, 1; Red-winged Blackbird, 1; Osprey, +; Bald Eagle, +; Barn Swallow, +. **Total:** 24 species; 64.5 family units (125/km², 51/100 acres). **Visitors:** Brown Pelican, Double-crested Cormorant, Great Blue Heron, Snowy Egret, Little Blue Heron, Tricolored Heron, Cattle Egret, Green-backed Heron, Wood Duck, Turkey Vulture, Snowy Plover, Am. Oystercatcher, Laughing Gull, Caspian Tern, Least Tern, Com. Ground Dove, Great Horned Owl, Com. Nighthawk, Blue Jay, Fish Crow, Brown-headed Nuthatch, White-eyed Vireo, Red-eyed Vireo, Rufous-sided

Towhee, Orchard Oriole. **Remarks:** The Chimney Swifts nested in the chimney at the house, but foraged widely. Some 8-10 Barn Swallows foraged daily over the overwash savannah. There were no nests on the beach or the overwash savannah (too many feral pigs?). Nests found: Red-bellied Woodpecker, Carolina Wren (2), and N. Parula (2). I thank Lawrence Alexander for help with the vegetation sampling and Refuge Manager Martin Perry for his hospitality and logistic support.—**STEPHEN P. CHRISTMAN, U.S. Fish and Wildlife Service, Denver Wildlife Research Center, 412 NE 16th Ave., Gainesville, FL 32601.**

172. TAMARACK BOG AND HARDWOOD. — **Location:** Michigan; Berrien Co., 1 mi SW of Stevensville in Grand Mere State Park, 0.05 mi N of Willow Dr; on Wishart Rd; 41°59'30"N, 86°33'W, Bridgman Quadrangle, USGS. **Continuity:** Established 1976; 8 consecutive years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AB 30:1049 (1976). **Weather:** Rainfall normal; temperature above normal. **Coverage:** June 4-5, 11-12, 18-19, 24-25; 0700-1700 hrs. Total obs.-hours: 8. **Census:** Canada Warbler, 3 (35, 14); E. Wood-Pewee, 2; Great Crested Flycatcher, 2; Blue Jay, 2; Veery, 2; Wood Thrush, 2; Downy Woodpecker, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Am. Robin, 1; Red-eyed Vireo, 1; Com. Yellowthroat, 1; Ovenbird, 1; Scarlet Tanager, 1; N. Cardinal, 1; Mourning Dove, +; Hairy Woodpecker, +. **Total:** 18 species; 23 territorial males (271/km², 109/100 acres). **Visitors:** N. Flicker, Red-headed Woodpecker.—**JAMES and CARL MULINS, 2558 Locust Lane, Stevensville, MI 49127.**

173. WETLAND SEDGE MEADOW I. — **Location:** Nebraska; Hall Co., NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Sec. 34, T10N, R10W, 40°47'N, 98°26'W, Alda Quadrangle, USGS. **Continuity:** Established 1981; 3 consecutive years. **Size:** 16.2 ha = 40 acres. **Description of Plot:** See AB 36:105-106 (1982). **Weather:** See Census 186. **Coverage:** June 6-10, 14-16; 0621-1107, CDT. Total obs.-hours: 7.1. **Census:** Red-winged Blackbird, 16 (99, 40); Brown-headed Cowbird, 4.5 females (28, 11); Upland Sandpiper, 4 (25, 10); Bobolink, 4; W. Meadowlark, 4; Wilson's Phalarope, 3 (19, 8); Blue-winged Teal, 2; Killdeer, 2; Com. Snipe, 1; Mourning Dove, 1; Mallard, +. **Total:** 11 species; 41.5 territorial males or females (256/km², 104/100 acres). **Visitors:** N. Pintail, Am. Wigeon, N. Bobwhite, N. Flicker, E. Kingbird, Barn Swallow, Am. Robin, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Red-winged Blackbird, 8; Mourning Dove, 1. Only 1 Bobolink was seen following flooding and the plot was 85% inundated. Plot was burned in April and was grazed during the census period.—**GARY R. LINGLE and KARI L. HAUGH, Platte River Whooping Crane Trust, 2550 N. Diers Ave., Suite H, Grand Island, NE 68801.**

174. WETLAND SEDGE MEADOW II. — **Location:** Nebraska; Hall Co., portions

of the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Sec. 26 and NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Sec. 35, T10N, R10W, 40°47'N, 98°25'W, Alda Quadrangle, USGS. **Continuity:** Established 1982; 2 consecutive years. **Size:** 16.2 ha = 40 acres. **Description of Plot:** See AB 37:101 (1983). **Weather:** See Census 186. **Coverage:** June 6-10, 14-16, 0652-1016, CDT. Total obs.-hours: 7.5. **Census:** Red-winged Blackbird, 16 (99, 40); Bobolink, 10 (62, 25); Brown-headed Cowbird, 5 females (31, 13); Wilson's Phalarope, 4 (25, 10); W. Meadowlark, 4; Upland Sandpiper, 3.5 (22, 9); Killdeer, 2.5; Yellow-headed Blackbird, 2; Mallard 1.5; Blue-winged Teal, 1; Mourning Dove, 1; **Total:** 11 species, 50.5 territorial males or females (312/km², 126/100 acres). **Visitors:** N. Pintail, Am. Wigeon, Red-tailed Hawk, Com. Snipe, N. Flicker, Barn Swallow, Com. Grackle. **Remarks:** Nests found: Red-winged Blackbird, 13, W. Meadowlark, 1. Yellow-headed Blackbirds invaded plot following flooding (60% inundated). This plot was grazed season-long beginning May 1.—**GARY R. LINGLE and KARI L. HAUGH, Platte River Whooping Crane Trust, 2550 N. Diers Ave., Suite H, Grand Island, NE 68801.**

175. 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; 9 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 31:84-85 (1976). **Weather:** First 3 trips, cold and overcast, balance on clear days with no wind or precipitation. **Coverage:** May 12, 21, June 4-5, 12, 16, 24; between dawn and 1000 hrs. Total obs.-hours: 31. **Census:** Yellow-headed Blackbird, 17 (42, 17); Red-winged Blackbird, 13 (32, 13); Song Sparrow, 12 (30, 12); Tree Swallow, 10 (25, 10); Am. Robin, 10; Barn Swallow, 6 (15, 6); Red-breasted Nuthatch, 6; Mallard, 5 (12, 5); Redhead, 5; Hammond's Flycatcher, 5; Marsh Wren, 5; Swainson's Thrush, 4 (10, 4); Yellow Warbler, 4; Dark-eyed Junco, 4; Chipping Sparrow, 4; Pied-billed Grebe, 3 (7, 3); Willow Flycatcher, 3; Black-capped Chickadee, 3; Ruby-crowned Kinglet, 3; Cedar Waxwing, 3; Com. Yellowthroat, 3; Pine Siskin, 3; Canada Goose, 2; Wood Duck, 2; Osprey, 2; Great Blue Heron, 2; Am. Coot, 2; Mourning Dove, 2; Rufous Hummingbird, 2; Calliope Hummingbird, 2; W. Wood-Pewee, 2; MacGillivray's Warbler, 2; Blue-winged Teal, 1; Prairie Falcon, 1; Ruffed Grouse, 1; Great Horned Owl, 1; N. Flicker, 1; E. Kingbird, 1; Violet-green Swallow, 1; N. Raven, 1; Orange-crowned Warbler, 1; Yellow-rumped Warbler, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; W. Tanager, 1; Cassin's Finch, 1; N. Goshawk, 1; Ring-billed Gull, +. **Total:** 48 species; 166 territorial males or females (410/km², 166/100 acres). **Remarks:** Weather was warm in early spring but then continued cool until early July with even colder weather and snow very late to the south of us. Many migrants returned very late or not at all. Goose nesting success appeared to be down through-

out the valley and warbler and flycatcher numbers were greatly reduced.—MARCELLA M. BISHOP, Shoreline Route, Polson, MT 59860.

176. 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. **Continuity:** New. **Size:** 6 ha = 14.8 acres. **Description of Plot:** A rectangle 300 × 200 m placed in a meadow with patches of willows. 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 3-35 ft in height, but were mostly between 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% sedges, 22.8% dead plant litter, 13.4% unidentified grasses, 7.8% Five Finger Cinquefoil, 6.3% Canada Thistle, 3.7% timothy (*Phleum paniculatum*), 3.6% rushes, 2.6% blue grass (*Poa* sp.), 2.0% soil, 1.8% Mountain False Lupine, 1.2% unidentified composite, 1% bedstraw, and less than 1% of the following plants; dock, Com. Dandelion, Wood Rose, horsetail, Blue-eyed Grass, mustard, Shepherd's-purse, *Epilobium* sp., and Solomon's-seal (*Smilacina* 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 inches of rain, which is 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 obs.-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, +; N. Harrier, +; Sandhill Crane, +; Bobolink, +; Am. Goldfinch, +. **Total:** 13 species; 34 territorial males (568/km², 230/100 acres). **Visitors:** Red-tailed Hawk, Am. Kestrel, Com. Night-hawk, Bank Swallow, Cliff Swallow, Barn Swallow, 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 plot, 70% (138) were in the willows. Willow Flycatcher, Am. Robin, Yellow Warbler, Song Sparrow, Red-winged Blackbird, 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. Savannah Sparrows and Bobolinks were associated with willows part of the time, using them primarily as singing posts. The remaining species which 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 the author 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 would like to thank the Malheur Nat'l Wildlife Refuge for permission to do this study, and for their cooperation in supplying necessary information.—DANIEL M. TAYLOR, 2903 Greenvale Pl., Nampa, ID 83651.

177. DESERT RIPARIAN-FRESH-WATER MARSH AND PONDS. — **Location:** California; San Bernardino Co., 0.5 mi E of Rte. 62, Big Morongo Wildlife Reserve 34°03'N, 116°35'W, Morongo Valley Quadrangle, USGS. **Continuity:** Established 1977; 7 consecutive years. **Size:** 15.38 ha = 38 acres. **Description of Plot:** See AB 32:113 (1977). **Weather:** Clear and calm except for NE wind 1 day with cool to warm mornings, 37-80°F during censuses. **Coverage:** Apr. 19, 27; May 3, 10, 17, 24, 26; June 1; 0600-1000. Total obs.-hours: 23. **Census:** Lesser Goldfinch, 27 (176, 71); Eur. Starling, 16 (104, 42); House Wren, 14 (91, 37); Bewick's Wren, 13 (85, 34); Song Sparrow, 9 (59, 24); Phainopepla, 8 (52, 21); Brown-headed Cowbird, 8; Rufous-sided Towhee, 7.5 (49, 20); Virginia Rail, 7 (46, 18); Costa's Hummingbird, 7; House Finch, 7; Anna's Hummingbird, 5 (33, 13); Ash-throated Flycatcher, 5; Bushtit, 5; California Thrasher, 5; Gambel's Quail, 4 (26, 11); Nuttall's Woodpecker, 4; Com. Yellowthroat, 4; Summer Tanager, 4; Verdin, 3.5 (23, 9); Blue-gray Gnatcatcher, 3 (20, 8); Lucy's Warbler, 3; Mourning Dove, 2; Plain Titmouse, 2; Yellow Warbler, 2; Yellow-breasted Chat, 2; N. Oriole, 2; Am. Kestrel, 1; Com. Barn-Owl, 1; Great Horned Owl, 1; Black-chinned Hummingbird, 1; Black Phoebe, 1; Brown-crested Flycatcher, 1; Bell's Vireo, 1; Hooded Oriole, 1; Cooper's Hawk, +; Red-tailed Hawk, +; White-winged Dove, +; Vermilion Flycatcher, +. **Total:** 39 species; 187 territorial males or females: (1216/km², 492/100 acres). **Visitors:** Spotted Dove, Greater Roadrunner, White-throated Swift, Ladder-backed Woodpecker, W. Kingbird, Cassin's Kingbird, Scrub Jay, N. Raven, Cactus Wren, Lazuli Bunting. **Remarks:** Nests located (50); Am. Kestrel (1), Com. Barn-Owl (1), Great Horned Owl (1), Black-chinned Hummingbird (1), Costa's Hummingbird (2), Anna's Hummingbird (4), Black Phoebe (1), Verdin (1), Bushtit (3), House Wren (7), Blue-gray Gnatcatcher (1), California Thrasher (1), Phainopepla (1), Eur. Starling (16), Lucy's Warbler (1), Hooded Oriole (1), House Finch (2), Lesser Goldfinch (5). The plot was very wet again this year, with much underground and surface water stimulating extensive cat-tail and sedge marsh growth. Virginia Rails have benefited from the additional marsh area. A number of large cottonwoods have fallen because of the saturated ground and heavy winter winds. Plain Titmouse was added this year, but Indigo Bunting did not breed. The Great Horned Owl

fledged young for the first time in 3 years. Special thanks to San Bernardino Valley Aud. Soc. and the San Bernardino County Museum for supporting this study.—EUGENE A CARDIFF, JESSIE BARBARA, and RAY KNIFFEN and THEO GLENN.—San Bernardino Co. Museum, 2024 Orange Tree Lane, Redlands, CA 92373.

178. LAKE WITH MARSH EDGE. — **Location:** California; San Diego Co., San Pasqual Valley, N of Old Pasqual Rd., E of San Pasqual Rd., S of San Pasqual Valley Rd., 33°06'N, 117°01'W, Escondido Quadrangle, USGS. **Continuity:** New. **Size:** 4.45 ha = 11 acres (irregular, determined by compass and measured pace). **Description of Plot:** Freshwater lake with emergent vegetation nearly continuous along N, E, and W shores, but intermittent along the S shore. Vegetation consists of 63% Broad-leaved Cat-tail, 37% tule, and occupies approximately 0.4 ha (1 acre). Remainder is open water. **Edge:** SW shore is bordered by willow riparian woodland, all other sides by pasture land. **Elevation:** 110 m (360 ft). **Weather:** Cool. **Coverage:** Apr. 2, 8, 17, 24; May 8, 15, 30, June 5, 12, 20, 28; July 4, 21; 0425-1100, PST. Total obs.-hours: 16. **Census:** Tricolored Blackbird, 94 colonial-nesting females (2112, 855); Red-winged Blackbird, 18 (404, 164); Marsh Wren, 12 (270, 109); Song Sparrow, 9 (202, 82); Com. Yellowthroat, 8 (180, 73); Am. Coot, 7 (157, 64); Ruddy Duck, 4 (90, 36); Pied-billed Grebe, 3 (67, 27); Least Bittern, 2; Cinnamon Teal, 2; Virginia Rail, 2; Com. Moorhen, 2; Mallard, 1. **Total:** 13 species; 164 territorial and colonial males and females (3684/km², 1491/100 acres). **Visitors:** Green-backed Heron, Black-crowned Night-Heron, Belted Kingfisher, Black Phoebe, N. Rough-winged Swallow, Cliff Swallow. **Remarks:** Census was based on actual nest count (Tricolored Blackbird), brood counts (grebe, ducks, coot, moorhen), and spot-mapping (all other species). Dependent young were observed for all species but the bittern.—KENNETH L. WEAVER, 1339 Taylor Place, Escondido, CA 92027.

179. MONTANE MEADOW. — **Location:** California; San Diego Co., Cuyamaca Rancho State Park, 32°58'30"N, 116°34'W, Cuyamaca Peak Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (irregular shape which includes two 5-ha meadows and excludes 2 small knolls, determined by pacing and measurements with a steel tape). **Description of Plot:** Seasonally wet *Carex-Juncus* meadow drained by 1 large stream and several minor tributaries. Vegetative cover is 100%, all less than 1 m in height. Two knolls with pine-oak woodland bisect the plot. The ground surface remained saturated until early June. Vegetative cover was determined by three 50 m × 2 m belt transects. Perennial and annual plants were evaluated using the Braun-Blanquet method of estimation. Dominant perennials included *Juncus mexicanus*, *J. xiphoides*, *Carex praegracilis*, *Eleocharis bella*, *Poa pratensis*, and *Sidalcea malvaef*.

flora The annual flora was extensive, showing significant patchiness in distribution and succession in flowering times at the meadow edge. Major annual species included *Bromus mollis*, *B. carinatus*, *B. tectorum*, *Limnanthes gracilis*, *Navarretia intertexta*, *Lepidium lasiocarpum*, *Veronica arvensis*, *Lamium amplexicaule*, and *Lotus purshianus*. **Topography:** Essentially flat. **Elevation:** 1426 m (4680 ft). **Weather:** Clear and cool. Precipitation = 7.0 cm. **Temp.** 6.8–20°C. **Coverage:** Apr. 15, 16, 29; May 6, 7, 13–16; 0600–0930. Total obs.-hours: 21.5. **Census:** W. Meadowlark, 6.5 (65, 26); Lark Sparrow, 3 (30, 12); Cassin's Kingbird, 1; Red-winged Blackbird, 1; W. Kingbird, 0.5. **Total:** 5 species; 12 territorial males (120/km², 49/100 acres). **Visitors:** Mallard, Cinnamon Teal, Turkey Vulture, Red-tailed Hawk, Mountain Quail, Great Horned Owl, N. Flicker, Black Phoebe, Ash-throated Flycatcher, Violet-green Swallow, Steller's Jay, N. Raven, W. Bluebird, Brewer's Blackbird, N. Oriole, House Finch. **Remarks:** The meadow was used extensively as feeding habitat for the visitors, many of which were breeding in adjacent oak woodland. This work was supported by the Calif. Dept. of Parks and Recreation. Thanks to H. and E. Wier, L. Frank, N. Gilbert, and J. Hirshberg for help with the vegetation transects.—*LARRY LAPRE and DOUG HOGAN, P.O. Box 5051, Riverside, CA 92517.*

180. RIPARIAN MARSH. — **Location:** California; Newport Beach, between Jambo-ree Rd and Back Bay Drive, Sec. 24, T10W, R65. **Continuity:** New. **Size:** 19.2 ha = 47.4 acres (rectangular, 230 × 835 m, from USGS topo). **Description of Plot:** A canyon bottom, oriented E-W, bordered on N and S by bluffs rising 50–100 ft. The upper ⅓ of the canyon supports a riparian corridor dominated by Arroyo Willow, and several dense stands of Broad-leaved Cat-tail. The willows average 25 ft in height and 6–10 in. dbh. The canopy varies from open to dense thickets with a limited understory of saplings, cat-tails and Pampas Grass (*Cortaderia selloana*). The floor of the riparian grove is blanketed by water-loving grasses and herbaceous plants. The SE corner of the canyon is dominated by ruderal vegetation; Castorbean, Sweet Fennel, and Russian Thistle. The slopes of the canyon exhibit a variety of plant associations depending upon the degree of disturbance. The slopes of the upper canyon are characterized by annual grasses, Field Mustard, and Russian Thistle, which grade into introduced ornamental shrubs (*Acacia*, *Eucalyptus*, pines, and ice plant *Mesembryanthemum* spp.). The bluffs of the lower canyon support relatively undisturbed coastal sage scrub; Bush Sunflower, Bladderpod, Black Sage, and a prickly pear (*Opuntia occidentalis*). The lower ⅓ of the canyon has recently been modified to create a freshwater pond and marsh. Of this, 4.6 ha (18 acres), 1.8 ha (4.5 acres) is old stream course which supports willows, cat-tails, and Watercress, and an open area of grasses and mustard. A shallow pond—2.8 ha (7 acres)—is being invaded by cat-tails, which fringe the pond and form small islands in shallow areas.

Willow saplings, Watercress, and small areas of mud or sand flats are found around the edge of the pond. **Edge:** Big canyon is surrounded by residential development and associated ornamental landscaping on 3 sides. The W end opens onto Upper Newport Bay, a tidal salt marsh. **Topography:** The canyon is ½ mi long, bordered by 50–100 ft bluffs. Elevations within the canyon range from 6 ft at the mouth to 45 ft at the E end. **Weather:** Extreme nighttime lows did not drop below 40°F while high temperatures reached into the 80s during the day. Precipitation was infrequent, falling on 3 occasions and totalling approximately 1 in. Morning overcast was common. **Coverage:** Apr. 7, 15, 21, 28; May 4, 11, 21, 27; June 11, 14; between dawn and 0900 hrs. Total obs.-hours: 29.5. **Census:** Song Sparrow, 45 (235, 95); Com. Yellowthroat, 23 (120, 49); House Finch, 14 (73, 30); Brown Towhee, 8 (42, 17); Mourning Dove, 7 (36, 15); N. Mockingbird, 7; Anna's Hummingbird, 6 (31, 13); Bushtit, 6; Eur. Starling, 5 (26, 11); Black Phoebe, 4 (21, 8); Marsh Wren, 4; Brown-headed Cowbird, 4; N. Oriole, 3 (16, 6); Lesser Goldfinch, 3; Sora, 2; Killdeer, 2; House Wren, 2; Swainson's Thrush, 2; Black-headed Grosbeak, 2; Am. Kestrel, 1; Clapper Rail, 1; Am. Avocet, 1; Spotted Dove, 1; Black-chinned Hummingbird, 1; Cactus Wren, 1; Loggerhead Shrike, 1; W. Meadowlark, 1; Am. Goldfinch, 1; House Sparrow, 1. **Total:** 29 species; 159 territorial males or females (829/km², 335/100 acres). **Visitors:** Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Am. Coot, Willet, dowitcher, W. Gull, Vaux's Swift, N. Flicker, Olive-sided Flycatcher, W. Flycatcher, N. Rough-winged Swallow, Cliff Swallow, Am. Crow, Ruby-crowned Kinglet, Am. Robin, Cedar Waxwing, Warbling Vireo, Orange-crowned Warbler, Yellow Warbler, Yellow-rumped Warbler, Wilson's Warbler, W. Tanager, Lincoln's Sparrow, White-crowned Sparrow, Golden-crowned Sparrow, Yellow-headed Blackbird, Red-winged Blackbird. **Remarks:** Nests found (6): Am. Avocet (1), Bushtit (3), Am. Kestrel (1), Black Phoebe (1). Bushtits appeared to breed early, the number of territorial males encountered during the census was not as high as was expected. Flocks were more common later in the count period. Song Sparrows and yellowthroats were found in all portions of the plot. House Finches, starlings, and mockingbirds were commonly associated with the borders of the plot. Marsh Wrens were confined to cat-tail patches at the W end. Occurrences of interest were: the Cactus Wren nesting in prickly pear on the bluffs; the presence of breeding Swainson's Thrushes; and the presence of a breeding pair of (Light-footed) Clapper Rails in the freshwater marsh at the W end of the canyon.—*CARL WILCOX and BARBARA W. MASSEY, 1825 Knoxville Ave., Long Beach, CA 90815.*

181. OLD FIELD HABITAT. — **Location:** New Jersey; Morris Co., Great Swamp NWR, 1 mi E of Basking Ridge; 40°42'30"N, 74°30'W, Bernards Quadrangle, USGS. **Continuity:** Established 1980; 4 consecutive

years. **Size:** 7.3 ha = 18.1 acres. **Description of Plot:** See AB 35:72 (1981). **Weather:** Average temp. for May was 54°F (28–80°). Total rainfall was 6.37 in. Average temp for June was 66°F (38–93°). Total rainfall was 4.85 in. **Coverage:** May 18, 25, 28; June 1, 3, 7, 11; 0530–0700. **Total:** 9 obs.-hours. **Census:** Yellow Warbler, 11 (150, 61); Song Sparrow, 9.5 (130, 52); Com. Yellowthroat, 5 (68, 28); Alder Flycatcher, 4 (55, 22); Swamp Sparrow, 4; Gray Catbird, 3 (41, 17); Field Sparrow, 3; Blue-winged Warbler, 1.5, Yellow-billed Cuckoo, 1; Rufous-sided Towhee, 1. **Total:** 10 species; 43 territorial males (587/km², 238/100 acres). **Visitors:** Mallard, Am. Woodcock, N. Harrier, Blue-gray Gnatcatcher, Am. Robin, Red-winged Blackbird, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** This year Alder Flycatchers replaced the usual breeding Willow Flycatchers of the past 3 years. One possible reason for this replacement may be the increased rainfall this spring. Standing water was present up until the last 2 census days. The Alder Flycatcher is known to periodically invade the Great Swamp area.—*JOANNE LASKOWSKI, 153 Pleasant Plains Road, Basking Ridge, NJ 07920.*

182. ABANDONED FIELD. — **Location:** Pennsylvania; Washington Co., 10.1 mi NW of Washington on Rt. 844 in Cross Creek Park; 40°15'N, 80°24'W, West Middletown Quadrangle, USGS. **Continuity:** New. **Size:** 6.37 ha = 15.75 acres. **Description of Plot:** A grassy field with Meadow Fescue (*Festuca elatior*) covering 76% of the plot in association with *Poa trivialis*, 10%; *Agropyron repens*, 5%; *Phleum pratense*, 3%; *Solidago rugosa*, 2%; *Aster lateriflorus*, 2%; *Dactylis glomerata*, 1%, and *Hedema glechoma*, 1%. **Edge:** Bordered on the S slope by blackberry thickets, and at the SW corner by a spring seep surrounded by White Ash and Ohio Buckeye, on the W slope by young E. White Pine and young Slippery Elm; on the N by a fence row of Black Cherry and blackberry thickets, and on the E slope by scattered blackberry thickets and a fence row of Black Cherry and Slippery Elm, with infiltrating hawthorns. **Topography:** A ridgeline sloping gently to the N and W and more sharply to the S and E. **Elevation:** 1280 ft. **Coverage:** May 14, 21, 25–28, June 1, 12–13, 26–28; July 28–29; August 2–3, 0530–1000. Total obs.-hours: 33.5. **Census:** Red-winged Blackbird, 13 (females) (204, 83); Henslow's Sparrow, 9 (141, 57); Com. Yellowthroat, 8 (126, 51); Mallard, 2; Ring-necked Pheasant, 1; Yellow-breasted Chat, 1. **Total:** 6 species; 34 territorial males and females (533/km², 216/100 acres). **Visitors:** Great Blue Heron, Turkey Vulture, Red-tailed Hawk, Rock Dove, Black-billed Cuckoo, Chimney Swift, Ruby-throated Hummingbird, Willow Flycatcher, Tree Swallow, Barn Swallow, Blue Jay, Am. Robin, Indigo Bunting, Rufous-sided Towhee, Field Sparrow, Savannah Sparrow, Song Sparrow, Bobolink, E. Meadowlark, Orchard Oriole, N. Oriole, Am. Goldfinch. **Remarks:** Nests found Red-

winged Blackbird, 2, Mallard, 2, 1 Ring-necked Pheasant brood was found. Henslow's Sparrows were observed carrying fecal pellets on 4 occasions. This is the second consecutive year in which Henslow's Sparrow has been observed at this location. Margaret and Roger Higbee surveyed the plot, Elizabeth Pernotto color-banded Henslow's Sparrows, and Thomas Hart conducted the vegetation analysis —*KIMBERLY L. MAY and VINNEDGE M. LAWRENCE, Dept. of Biology, Washington and Jefferson College, Washington, PA 15301.*

183. ABANDONED FARMLAND. —

Location: Illinois; Champaign Co., Phillips Tract, 6.5 km NE of Urbana; T19N, R9E, NE $\frac{1}{4}$, Sec. 2, SE $\frac{1}{4}$, NW $\frac{1}{4}$ Urbana Quadrangle, USGS. **Continuity:** New (1981); 3 consecutive years. **Size:** 13.5 ha = 33.4 acres. **Description of Plot:** Released from crop farming in 1968. Bounded on the W by a drainage channel. An oxbow cut off from the main channel is located in the SE corner. Pasture occurs to the S, cropland to the N and SE, Blue Grass (*Poa pratensis*) and old field research areas to the E, and old field and early successional forest to the W. A gravel road runs along the W and S. Power lines run E-W through the center and along the S across the oxbow. Woody vegetation under these lines is periodically killed by Illinois Power Co. personnel; last done in late summer, 1982. Topography is flat with maximum relief of 8 ft. Forbs predominate at an average height of approx 1.5m in August. Canada Goldenrod and Giant Ragweed dominate, forming thick patches in late summer. Other forbs well represented include, an ironweed (*Vernonia altissima*), thistle (*Cirsium spp.*), Queen Anne's-lace, Teasel, Com. Milkweed, aster, and fleabane. Indian Hemp and False Boneset are patchily distributed. Clover and Com. Ragweed are most evident in areas of less dense cover. Clover is especially evident in early summer as is Wild Parsnip. Grass cover, in order of relative importance, includes, Blue Grass, Brome Grass (*Bromus spp.*), Timothy (*Phleum pratense*), Wild Rye (*Elymus canadense*), Wild Barley (*Hordeum pusillum*) and Indian Grass (*Sorghastrum nutans*). A quantitative survey of woody vegetation was completed in late summer, 1981. There is a decline in size and density of woody vegetation, S to N. Largest trees on the area are Silver Maples along the S access road. A line of large trees occurs off the W edge. Fewer occur on the N and off the E edge. Black Cherry is particularly abundant along the two power line rights-of-way. Borings of several trees of various species in 1981 showed that most ranged from 8-12 years of age. Shrub species (>1m tall, <3 cm dbh) comprising 92% of total (212 point-quarters) include hawthorn (23%), Trumpet-creeper (17%), Black Cherry (15%), rose (7%), Slippery Elm (4%), Honeylocust (4%), Hackberry (4%), and Green Ash (3%). Trumpet-creeper and brambles occur as low growth (<1m) in variously sized patches. Other woody ground cover includes grape, Poison Ivy, rose, and hawthorn. Trees (≥ 3 cm dbh) quantified on 53, 0.05 ha sites yielded:

230 per ha, total basal area, 1.2 m² per ha Species comprising 93% of total number of trees [figures following each species are trees/ha, rel. den. (%), rel. dom. (%), and freq. (%):] Black Cherry 108, 39, 37, 79; Green Ash 44, 16, 11, 32; hawthorn 31, 11, 7, 51; Honey Locust 30, 11, 14, 49; Boxelder 23, 8, 9, 32; Silver Maple 23, 8, 15, 9. Trees by diameter size class [figures are trees/ha, rel. den. (%), basal area (m²/ha, rel. dom. (%)): Sap (3-8 cm), 227, 81, 0.5, 44; A (8-15 cm) 48, 17, 0.5, 41; B (15-22) 3, 1, 0.1, 7. Shrub stems per ha, 1500 (range 0-7160); ground cover 94%; canopy cover, 11%. Mean max. canopy height, 4.8m (range 1.8-13.7). **Coverage:** All censuses 0530-1200 hrs, CDT. **1981:** May 19-20, 26-27; June 1, 4-5, 8, 10-12, 15-18, 23, 25. Total obs.-hours: 23. **1982:** April 21; May 3-4, 13, 26; June 14, 25; July 7, 21. Total obs.-hours: 38. In 1983 an additional 20 hours was spent in nest searches between June 15 and 24. **Census:** See table 1 below. **Remarks:** The major avian components are FE and OF species, together comprising 83-88% of the species totals and 75-84% of the pair totals (exclusive of Green-backed Heron, Com. Grackle, and Brown-headed Cowbird;

numbers of Am Goldfinches also excluded) An increase in pairs of FE (45%) and OF (85%) species in 1983 contributed significantly to the overall increase in pair totals. An increase in pairs of G species from 1981 to 1982, due to a doubling in Red-winged Blackbird numbers is also notable. Variations of these magnitudes do not appear extraordinary, however. It would be premature to attach much significance to these prior to gathering several more years of census data. OF species, as well as 2 CF species encountered, tended to be associated with margins of the plot, where taller trees were located, in contrast to FE species which occurred throughout the plot. Com. Grackles did not breed in the immediate vicinity.—*DAVID J. TAZIK, Shelford Vivarium, Univ. of Illinois, Champaign, IL 61820.*

184. ABANDONED AGRICULTURAL LANDS I. —

Location: Tennessee, Maury Co., 0.4 mi W of Duck River at Cannon Bend near town of Columbia; 35°35'50"N, 86°58'20"W, Glendale Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Hay and pastureland operations were abandoned about 6 years ago.

Table 1. Results of 3 years of censuses at Phillips Tract, Champaign Co., Illinois. Numbers in parentheses are no./km² and no./100 acres.¹

Species	Biotope ²	1981	1982	1983
Green-backed Heron	—			1 (7, 3)
Ring-necked Pheasant	G	2 (15, 6)	2	3 (22, 9)
Am. Woodcock	OF		1 (7, 3)	
Mourning Dove	OF		1 (7, 3)	
Yellow-billed Cuckoo	OF	2 (15, 6)	1 (7, 3)	2
Ruby-throated Hummingbird	OF			1 (7, 3)
Downy Woodpecker	CF			+
N. Flicker	OF	+	+	2 (15, 6)
Willow Flycatcher	FE	6 (44, 18)	5 (37, 15)	8 (59, 24)
Great Crested Flycatcher	CF	+		
E. Kingbird	FE	1 (7, 3)	+	+
Blue Jay	OF	1 (7, 3)	+	+
House Wren	OF	2 (15, 6)	1 (7, 3)	3 (22, 9)
Blue-gray Gnatcatcher	OF		1 (7, 3)	
Am. Robin	OF	+	3 (22, 9)	3
Gray Catbird	FE	1 (7, 3)	2 (15, 6)	4 (30, 12)
Brown Thrasher	FE	7 (52, 21)	4 (30, 12)	5 (37, 15)
Eur. Starling	FE			+
White-eyed Vireo	FE	+	1 (7, 3)	1
Bell's Vireo	FE	2 (15, 6)	2	3 (22, 9)
Yellow Warbler	FE	6 (44, 18)	8 (59, 24)	8
Com. Yellowthroat	FE	10 (74, 30)	13 (96, 39)	15 (111, 45)
Yellow-breasted Chat	FE	2 (15, 6)	2	8 (59, 24)
N. Cardinal	OF	3 (22, 9)	2 (15, 6)	6 (44, 18)
Rose-breasted Grosbeak	OF	1 (7, 3)	+	1
Indigo Bunting	OF	4 (30, 12)	3 (22, 9)	6 (44, 18)
Rufous-sided Towhee	FE	2 (15, 6)	1 (7, 3)	3 (22, 9)
Field Sparrow	FE	9 (67, 27)	9	11 (82, 33)
Song Sparrow	FE			2 (15, 6)
E. Meadowlark	G	2 (15, 6)	2	
Red-winged Blackbird	G	8 (59, 24)	16 (118, 48)	15 (111, 45)
Com. Grackle	—	+	+	+
Brown-headed Cowbird	—	+ NS	+ NS	+ NS
Am. Goldfinch	FE	+ NS	+ NS	+ NS
Species		26	28	29
Pairs ³		71 (525, 213)	80 (592, 240)	111 (821, 333)

¹ + — Density too low to quantify. + NS — Present but not adequately censused.

² G — Grassland, FE — Field edge, OF — Open forest, CF — Closed forest.

³ Pair totals do not include Brown-headed Cowbird or American Goldfinch.

The site is currently in assorted grasses, annual weeds and interspersed with low-growing shrubs averaging 4 ft in height. Dense stands of Bull Thistle, 7 ft in height, occur at several locations. A quantitative survey of the vegetation gave the following results: No trees 3 in. or greater in diameter, based on 5 0.1-acre circular plots. Shrubs (woody stems less than 3-in. diameter) within 10 0.01-acre transects: Coralberry, 1580/acre; Sugarberry, 720; ash, 390; elm, 150; E. Redcedar, 140; Chickasaw Plum, 40; Chinkapin Oak, 40; Post Oak, 30; Smooth Sumac, 30; Winged Elm, 20; Blackgum, 10; Shumard Oak, 10. Percent relative dominance of ground cover was determined from 50 1-m² plots: Fescue (*Festuca* sp.), 24; Japanese Honeysuckle, 14; Low Hop Clover, 12; aster, 7; Brome Grass (*Bromus* sp.), 7; Widow's Cross (*Sedum pulchellum*), 5; Panic Grass (*Panicum* sp.), 4; sunflower, 3; Com. Ragweed, 3; Bull Thistle, 2; Daisy Fleabane (*Erigeron strigosus*), 2; Yellow Sweet Clover, 2; Broomsedge (*Andropogon virginicus*), 1; Ox eye Daisy, 1; Allen's Buttercup, 1; and 33 other species, mostly annual plants, all less than 1%. Shrub stems/acre, 3160; ground cover, 98%. **Edge:** Bordered on all sides by similar habitat. Upland hardwood forest within 0.1 mi N of plot. **Topography:** Gently rolling with occasional limestone outcroppings. **Elevation:** 580 ft. **Weather:** Clear to partly cloudy. Temperatures ranged from 53-70°F. **Coverage:** June 6-10; 0600-0800, CST. Total obs.-hours: 10. **Census:** Indigo Bunting, 4 (66, 27); Field Sparrow, 4; Red-winged Blackbird, 4; Com. Yellowthroat, 3 (49, 20); N. Bobwhite, 2; Prairie Warbler, 2; E. Meadowlark, 2; Rufous-sided Towhee, 1; Am. Goldfinch, 1; Brown Thrasher, 0.5; Yellow-breasted Chat, 0.5; Blue Grosbeak, 0.5; N. Mockingbird, +; N. Cardinal, +. **Visitors:** Mourning Dove, Chimney Swift, E. Kingbird, Barn Swallow, Brown-headed Cowbird. **Total:** 14 species; 24.5 territorial males (404/km², 163/100 acres). **Remarks:** Red-winged Blackbirds established their territories around the thistle stands which are structurally similar to the cat-tail stands typically used.—*LINDA J. FOWLER and DALE K. FOWLER, Division of Land and Forest Resources, Tennessee Valley Authority, Norris, TN 37828.*

185. ABANDONED AGRICULTURAL LAND II. — **Location:** Tennessee, Maury Co., 0.1 mi W of Duck River at Cannon Bend near Columbia; 35°35'45"N, 86°58'40"W, Glendale Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres. **Description of Plot:** Hay and pastureland operations were abandoned about 6 years ago. The site is currently in assorted grasses and annual weeds interspersed with scattered, low-growing shrubs averaging 4 ft in height. Several dense stands of Bull Thistle (*Carduus lanceolata*) 7 ft in height and a small, narrow drain containing cat-tails (*Typha latifolia*) are present on the site. A quantitative survey of the vegetation gave the following results: No trees 3-in. or greater in diameter, based on 5 0.1-acre circular plots. Shrubs (woody stems) less than 3 in. diameter based on 10 0.01-acre transects: Coralberry, 970 shrubs/acre; Winged Elm,



BBC 185, Maury Co., Tenn. Abandoned Agricultural Land II.

830; Sugarberry, 600; Honeylocust, 390; Chickasaw Plum, 270; Upland Forestiera, 40; elm, 30; Chinkapin Oak, 20; Flowering Dogwood, 10; E. Redcedar, 10; Carolina Buckthorn, 10. Percent relative dominance of ground cover was determined from 50 1-m² plots: Fescue (*Festuca* sp.), 19; Low Hop Clover, 14; Bull Thistle, 13; goldenrod, 13; Com. Strawberry, 12; Trumpet creeper, 4; Pitcher's Sandwort, 3; brome grass (*Bromus* sp.), 3; blackberry, 3; Lyre-leaved Sage, 3; Ox Eye Daisy, 2; a daisy fleabane (*Erigeron strigosus*), 2; sunflower, 1; morning-glory (*Ipomoea* sp.), 1; Yellow Sweet Clover, 1; Panic Grass (*Panicum* sp.), 1; a prairie-clover (*Petalostemum gattingeri*), 1; Widow's Cross, 1; Coralberry, 1; Crownbeard, 1; and 30 other species, mostly annual plants, all less than 1%. Shrub stems/acre, 3180. Ground cover, 96%. **Edge:** Bordered on all sides by similar habitat. Shrubland with scattered hardwood trees 0.1 mi N of plot. **Topography:** Gently rolling terrain with limestone outcroppings. **Elevation:** 600 ft. **Weather:** Clear to partly cloudy. Temp. range, 53-70°F. **Coverage:** June 6-10; 0600-0800, CST. Total obs.-hours: 10. **Census:** Field Sparrow, 5 (82, 33); Indigo Bunting, 4 (66, 27); E. Meadowlark, 3 (49, 20); Red-winged Blackbird, 3; Brown Thrasher, 2; Prairie Warbler, 2; Com. Yellowthroat, 2; Rufous-sided Towhee, 2; N. Bobwhite, 1.5; Am. Goldfinch, 1; Blue Grosbeak, 0.5; N. Mockingbird, +; Yellow-breasted Chat, +; N. Cardinal, +. **Visitors:** Mourning Dove, Com. Nighthawk, Chimney Swift, E. Kingbird, N. Rough-winged Swallow, Barn Swallow, Brown-headed Cowbird. **Total:** 14 species; 26 territorial males (428/km², 173/100 acres). **Remarks:** Red-winged Blackbirds established their territories around the thistle stands which are structurally similar to the cat-tail stands typically used.—*LINDA J. FOWLER and DALE K. FOWLER, Division of Land and Forest Resources, Tennessee Valley Authority, Norris, TN 37828.*

186. SUBIRRIGATED GRASSLAND. — **Location:** Nebraska; Hall Co., NE 1/4 of the SE 1/4 of Sec. 33, T10N, R10W, 40°47'N, 98°26'W, Alda Quadrangle, USGS. **Continuity:** Established 1981; 3 consecutive years. **Size:** 16.2 ha = 40 acres. **Description of Plot:** See AB 36:105 (1982). **Weather:** Average temp. for May and June were 56.8° and 69.6°F respectively, below normal. Precipitation for May and June was 4.74 in. and 7.69 in. respectively, 5.01 in. above normal. Rapid snowmelt in Colorado, in conjunction with above normal precip., caused lowland flooding throughout the Platte River Valley. Flooding began on our plots on June 14 and destroyed most ground nests. **Coverage:** June 6-10, 14-16; 0619-1159, CDT. Total obs.-hours: 6.2. **Census:** Red-winged Blackbird, 9 (56, 23); Bobolink, 6 (37, 15); Brown-headed Cowbird, 5 ♀ (31, 13); Grasshopper Sparrow, 4 (25, 10); Upland Sandpiper, 3.5 (22, 9); W. Meadowlark, 3.5 (22, 9); Killdeer, 2.5; Blue-winged Teal, 1.5; Mourning Dove, 1; Mallard, +. **Total:** 10 species, 36 territorial males or females (222/km², 90/100 acres). **Visitors:** Ring-necked Pheasant, N. Bobwhite, Com. Snipe, N. Flicker, E. Kingbird, N. Rough-winged Swallow, Barn Swallow, Am. Robin, Com. Grackle, N. Oriole. **Remarks:** Nests found: Blue-winged Teal (1), Grasshopper Sparrow (1). An influx of Red-winged Blackbirds occurred following flooding. This grassland was not burned this spring and it was grazed for 11 days prior to censusing. Plot was 95% inundated following flooding.—*GARY R. LINGLE and KARI L. HAUGH, Platte River Whooping Crane Trust, 2550 N. Diers Ave., Suite H, Grand Island, NE 68801.*

187. SUBIRRIGATED NATIVE HAY. — **Location:** Nebraska; Hall Co., NW 1/4 of the SW 1/4 of Sec. 34, T10N, R10W, 40°47'N, 98°26'W, Alda Quadrangle, USGS. **Continuity:** Established 1981; 3 consecutive years. **Size:** 16.2 ha = 40 acres. **Description**

of Plot: See AB 36 105 (1982) **Weather:** See Census 186. **Coverage:** June 6-10, 14-16, 0629-1057, CDT. Total obs.-hours: 8.2. **Census:** Grasshopper Sparrow, 8 (49, 20); Bobolink, 8, W. Meadowlark, 7 (43, 18); Brown-headed Cowbird, 6.5 ♀ (40, 16); Upland Sandpiper, 6 (37, 15); Red-winged Blackbird, 1, Blue-winged Teal, 1; Mourning Dove, 1; Mallard, +. **Total:** 9 species; 39 territorial males or females ($241/\text{km}^2$, 98/100 acres). **Visitors:** Ring-necked Pheasant, Com. Snipe, N. Flicker, E. Kingbird, N. Rough-winged Swallow, Barn Swallow, Am. Crow, Am. Robin, Com. Grackle, N. Oriole, Am. Goldfinch. **Remarks:** Nests found: Upland Sandpiper, (4), Blue-winged Teal (1), Mourning Dove (1), Bobolink (1), W. Meadowlark (1). Influx of Bobolinks occurred on drier sites as neighboring areas flooded. Plot was 50% inundated following flooding; $\frac{1}{2}$ of plot is now pasture and $\frac{1}{2}$ is native hay. The pasture was grazed beginning June 13 and we attempted to burn this section in April with limited success.—*GARY R. LINGLE and KARI L. HAUGH, Platte River Whooping Crane Trust, 2550 N. Diers Ave., Suite H, Grand Island, NE 68801.*

188. VILLAGE, RESIDENTIAL. —
Location: Ohio; Wyandot Co., Crawford Twp., Carey, S of W Findlay St.; W of S Vance St.; E of W St. The plot is roughly quadrilateral, about $40^\circ 57'N$, $83^\circ 23'W$, Carey Quadrangle, USGS. **Continuity:** New. **Size:** About 19.4 ha = 48 acres. **Description of Plot:** See AB 31:91 (1977) and 32:124 (1978) for a generalized village environment. **Edge:** Supplied by streets, alleys, and railroad right-of-way. Total street-miles, 1.15. Total street-edge miles, 1.44. Total trees per 1.15 street-miles, 108; 93 per street-mile; 75 per street-edge mile. Trees almost lacking on the E edge at commercial section. Trees are mostly Silver Maple (*Acer saccharinum*). **Elevation:** 820 ft. **Coverage:** Almost daily; variable time. Total obs.-hours: 50. **Census:** House Sparrow, 20 (103, 42); Eur. Starling, 15 (77, 31); Am. Robin, 8 (41, 17); Chimney Swift, 5 (26, 10); House Wren, 3 (15, 6); Com. Grackle, 3; Mourning Dove, 2; Blue Jay, 1; Gray Catbird, 1; N. Cardinal, 1; Chipping Sparrow, 1; Song Sparrow, 1. **Total:** 12 species; 61 pairs ($314/\text{km}^2$, 127/100A). **Remarks:** Although a wet period in late May into June may have caused nest-building difficulties for a few pairs, the majority should not have been affected since over half of the pairs were either hole-nesting or artifact-nesting birds, thereby receiving some protection. This area of the village is characterized by very large lots on which there is less shrubbery than elsewhere in the village. No cowbird eggs or young were observed.—*A. H. CLAUGUS, 228 S Lake St., Carey, OH 43316.*

189. SUBURBAN BIRD SANCTUARY. —
Location: New York; Nassau Co., Theodore Roosevelt Sanctuary, 134 Cove Rd., Oyster Bay, $40^\circ 52'N$, $72^\circ 26'W$, Hicksville Quadrangle, USGS. **Continuity:** New. **Size:** 4.29 ha = 10.6 acres. **Description of Plot:** The Theodore Roosevelt Sanctuary was estab-

lished in 1923. Early management practices included planting a wide variety of native and ornamental trees, shrubs, and herbaceous plants which were thought to have some value in attracting birds. As a result of this, a good part of the flora is composed of plants that are not normally found in this area. There is no natural water on the property. However, city water is piped to 3 small, ground level pools and a large fountain. The area can be divided into 4 different community types: (1) deciduous forest (2.9 ha = 7.3 acres), (2) landscaped woods (0.6 ha = 1.5 acres), (3) brushy area (0.5 ha = 1.5 acres), and (4) clearcut with shrubby islands (0.3 ha = 0.7 acres). (1) Deciduous forest: The dominant canopy trees are Red Maple and Tulip-tree. Most prominent in the understory are Spicebush and S. Arrow-wood. The ground-cover is primarily English Ivy, Virginia Creeper, and Periwinkle. In one 0.5 acre (0.2 ha) section of the forest the understory and ground-cover consist almost entirely of Mexican Bamboo at 30,000 stems/acre. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, 130/acre; total basal area $148.5 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Red Maple, 26.6, 20.4, 2.5, 27; Tulip-tree, 18.6, 14.3, 45.6, 27; N. Red Oak, 10.6, 8.2, 17.8, 27; Sassafras, 10.6, 8.2, 7.7, 13.3; Black Locust, 10.6, 8.2, 6.6, 20; E. Hemlock, 8, 6.1, 5.2, 13.3; Sweet Birch, 8, 6.1, 1.8, 13.3; Flowering Dogwood, 8, 6.1, .9, 13.3; spruces, 5.3, 4.1, .7, 13.3; Asiatic Sweetleaf, 5.3, 4.1, .4, 6.7. Trees by diameter size class: A (3-6 in.) 53.3, 41, 5.3, 3.5; B (6-9 in.) 18.6, 14.3, 5.6, 3.6; C (9-15 in.) 16, 12.2, 12.8, 8.4; D (15-21 in.) 18.6, 14.3, 33.5, 21.9; E (21-27 in.) 16, 12.2, 49.6, 32.4; F (27-33 in.) 5.3, 4.1, 26, 17; H (40 in.) 2.6, 2.0, 20.3, 13.3. Shrub stems per acre, 1242.7; ground cover 72.3%; canopy cover 95.7%; mean canopy height, 85.9 ft (range 16.6-194). (2.) Landscaped woods: The dominant canopy tree is N. Red Oak. Most prominent in the understory are Winged Euonymous (*Euonymus alata*) and *Photinia parvifolia*. The ground cover is primarily English Ivy and Periwinkle. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, 144/acre; total basal area $15.84 \text{ ft}^2/\text{acre}$. Species comprising 50% of the total number of trees: E. Hemlock, 24, 16.7, 24.2, 40; N. Red Oak, 16, 11.1, 21.2, 40; Black Walnut, 16, 21.2, 21.2, 20; Am. Holly, 16, 11.1, 6.1, 20. Trees by diameter size class: A (3-6 in.) 40, 27.7, .8, 5; B (6-9 in.) 64, 44.4, 3.84, 24.2; C (9-15 in.) 16, 11.1, 2.6, 16.1; D (15-21 in.) 24, 16.6, 8.6, 54.6. Shrub stems/acre, 216; ground cover, 75%; canopy cover, 85%; mean canopy height, 66.7 ft (range 33.4-116.2). (3) Brushy Areas: The dominant canopy tree is Black Locust. Most prominent in the understory are Spotted Touch-me-not, catbrier and brambles. The ground cover is primarily English Ivy. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, 100/acre; total basal area $38.7 \text{ ft}^2/\text{acre}$. Species comprising 70% of the total number of trees: Black Locust, 20, 20, 41.4, 33.3; E. Hemlock, 13.3, 13.3, 19, 16.7, Flowering Dogwood, 13.3, 13.3, 6.9, 33.3; Norway Maple, 13.3, 13.3, 3.4, 33.3; Black Cherry, 13.3, 13.3, 3.4, 16.7. Trees by diameter size class: A (3-6 in.) 40, 40, 4, 10.3; B (6-9 in.) 26.7, 26.7, 8, 20.7; C (9-15 in.) 33.3, 33.3, 26.7, 69. Shrub stems/acre, 7180; ground cover 87.6%; canopy cover, 73.3%; mean canopy height 50.9 ft (range 9.9-167). (4) Clearcut with Shrubby Islands: This area, first cleared in 1974, has been mowed once a year since then. The dominant canopy trees are Flowering Dogwood and Black Oak. Most prominent in the understory are Spicebush and Hercules'-club. The ground cover is primarily White Wood Aster and grasses. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, 35.4/acre; total basal area $28.1 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Flowering Dogwood, 17.7, 50, 13.8; Black Oak, 8.1, 22.7, 34.5; Black Cherry, 3.2, 9.1, 35.6; Sweet Cherry, 3.2, 9.1, 14.9. Trees by diameter size class: A (3-6 in.) 14.5, 40.4, 1.5, 5.2; B (6-9 in.) 4.8, 13.4, 1.5, 5.2; C (9-15 in.) 8.6, 24, 6.5, 23; D (15-21 in.) 4.8, 13.4, 8.7, 31; E (21-27 in.) 3.2, 8.9, 10, 35.6. Shrub stems/acre, 608; ground cover 94%; canopy cover 41%; mean canopy height 40.6 ft (range 13.3-89.6). **Edge:** Bordered on W and part of N by a patchwork of deciduous forest and houses; S and E by paved road; remainder of N by a cemetery. **Topography:** Hilly 1-25% slopes. **Elevation:** 20-60 ft. **Weather:** Wet spring, skies clear to cloudy. Temperatures 50° - 70°F . **Coverage:** May 14, 22, 28; June 5, 12, 18-19, 25-26; July 2, 0615-0907 hours. Total obs.-hours: 13. **Census:** Gray Catbird, 10.5 (245, 99); N. Cardinal, 10 (233, 94); Com. Grackle, 7.5 (175, 71); House Wren, 7 (163, 66); Am. Robin, 3 (70, 28); N. Oriole, 3; Blue Jay, 2.5; Black-capped Chickadee, 2.5; Downy Woodpecker, 2; Wood Thrush, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Red-bellied Woodpecker, 1; N. Flicker, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Eur. Starling, 1; Red-eyed Vireo, 1; Song Sparrow, 1; House Finch, 1; E. Screech-Owl, 0.5; Am. Crow, 0.5; Veery, 0.5; Scarlet Tanager, 0.5; House Sparrow, 0.5; Hairy Woodpecker, +. **Total:** 26 species; 62 territorial males or females ($1445/\text{km}^2$, 585/100 acres). **Visitors:** Sharp-shinned Hawk, Black-billed Cuckoo, Chimney Swift, Ruby-throated Hummingbird, E. Wood-Pewee, E. Phoebe, Great Crested Flycatcher, Carolina Wren, Hermit Thrush, Blue-winged Warbler, Parula, Yellow Warbler, Black-throated Green Warbler, Black-and-white Warbler, Am. Redstart, Ovenbird, Com. Yellowthroat, Indigo Bunting, Red-winged Blackbird, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** Nests found (17) House Wren (5), Gray Catbird (3), Am. Robin (2), N. Oriole (2), Red-bellied Woodpecker (1), Downy Woodpecker (1), Blue Jay (1), Black-capped Chickadee (1), N. Cardinal (1) This work is part of a master plan project funded by a New York State Natural Heritage Trust Grant. Thanks to Julia Antal, Cynthia and Paul Broderick, Gina Jacobsen, Travis MacClendon, Jonathan Putnam, and Roger

Schwoerer for bird observations. Special thanks to Ken Heilshorn, Joe Morris and Richard Storrs for laying the grid and helping with the vegetation survey.—*MARGUERITE WOLFFSOHN* (compiler), and *WILLIAM J. KOLODNICKI*, *Theodore Roosevelt Sanctuary, 134 Cove Road, Oyster Bay, NY 11771.*

190. 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; 7 consecutive years. **Size:** 6.0 ha = 14.8 acres. **Description of Plot:** See AB 33:70 (1979). **Weather:** Data from NOAA station, Avoca, Pa.; May cool (2.9°F below average), June wet (1.39 in. above average); July and August dry (0.63 in. and 1.70 in. below average, respectively). During counts (except February) average temp. was 59°F (range = 37-80°). Skies variable, usually clear with little or no wind (range = 0-4 mph). **Coverage:** Feb. 24; Apr. 28; May 5, 12, 18, 25; June 2, 10, 17, 30; July 5-6, 13, 28; Aug. 25; 0450-1000, EST. Total obs.-hours: 45. **Census:** Red-eyed Vireo, 6 (100, 41); Black-capped Chickadee, 5.5 (92, 37); Ovenbird, 4.5 (75, 30); Wood Thrush, 4 (67, 27); Brown-headed Cowbird, 4; Scarlet Tanager, 3.5 (58, 24); Cedar Waxwing, 3 (50, 20); Tufted Titmouse, 2.5; Great Crested Flycatcher, 2; Blue Jay, 2; Black-and-white Warbler, 2; Chipping Sparrow, 2; E. Wood-Pewee, 1.5; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Blue-gray Gnatcatcher, 1; Rose-breasted Grosbeak, 1; Hairy Woodpecker, 0.5; N. Flicker, 0.5; Broad-winged Hawk, +; Ruffed Grouse, +; Great Horned Owl, +; Ruby-throated Hummingbird, +; Pileated Woodpecker, +; Am. Robin, +; Canada Warbler, +; N. Cardinal, +; Indigo Bunting, +; Rufous-sided Towhee, +; N. Oriole, +. **Total:** 31 species; 48.5 pairs (810/km², 328/100 acres). **Visitors:** Red-bellied Woodpecker, E. Phoebe, E. Kingbird, Am. Crow, E. Bluebird, Veery, Gray Catbird, Field Sparrow, Red-winged Blackbird, Com. Grackle, Am. Goldfinch. **Remarks:** Nests found: Blue Jay (1), Black-capped Chickadee (4), Tufted Titmouse (1), Wood Thrush (4), Red-eyed Vireo (1); Fledglings observed: Hairy Woodpecker, E. Wood-Pewee, Great Crested Flycatcher, Cedar Waxwing, Black-and-white Warbler, Ovenbird, Scarlet Tanager, Indigo Bunting, Rufous-sided Towhee, Chipping Sparrow. Cowbird host: Scarlet Tanager. The breeding bird density was 12% higher than in 1982, the highest previous density. Cavity-nesting permanent residents have increased their density 5-fold since 1978. In the same period, densities of neotropical migrants varied, but without trend. Gypsy moth egg cases and caterpillars were common, but not as abundant as in the past 3 years. Gypsy moth defoliation was limited to oaks where it was less than 10%. Breeding Wood Thrushes arrived and established territories 2 weeks later than usual. J. D. Montgomery and V. L. Schnerr assisted with the gypsy moth defoliation study. This census is part of a study sponsored by the

Pennsylvania Power and Light Co.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.*

191. 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; 7 consecutive years. **Size:** 11.05 ha = 27.3 acres. **Description of Plot:** See AB 33:70 (1979). **Weather:** Like census 190, but with mean temp. during counts 62°F (range = 40-82°) and cloud cover variable, sometimes foggy or hazy near dawn, with no wind. **Coverage:** Apr. 26; May 4, 11, 17, 24, 31; June 6, 15, 24; July 7, 8, 11, 19; August 23; 0445-1000, EST. Total obs.-hours: 55. **Census:** Scarlet Tanager, 8 (72, 29); Black-capped Chickadee, 5.5 (50, 20); Brown-headed Cowbird, 5 (45, 18); Red-eyed Vireo, 4.5 (41, 16); Rose-breasted Grosbeak, 4.5; Tufted Titmouse, 4 (36, 15); Wood Thrush, 3.5 (32, 13); E. Wood-Pewee, 3 (27, 11); Blue Jay, 3; Black-and-white Warbler, 3; N. Cardinal, 2.5; Cedar Waxwing, 2; Downy Woodpecker, 1.5; House Wren, 1.5; Hooded Warbler, 1.5; N. Flicker, 1; Fish Crow, 1; Brown Creeper, 1; Blue-gray Gnatcatcher, 1; Gray Catbird, 1; Worm-eating Warbler, 1; Ovenbird, 1; Rufous-sided Towhee, 1; N. Oriole, 1; Broad-winged Hawk, +; Red-tailed Hawk, +; Ruffed Grouse, +; E. Screech-Owl, +; Hairy Woodpecker, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Am. Crow, +; White-breasted Nuthatch, +; Veery, +; Am. Robin, +; Am. Redstart, +; Com. Yellowthroat, +; Indigo Bunting, +. **Total:** 38 species; 62 pairs (561/km², 227/100 acres). **Visitors:** Yellow-billed Cuckoo, E. Kingbird, Carolina Wren, Yellow-throated Vireo, Pine Warbler, Chestnut-sided Warbler, Com. Grackle, Field Sparrow, Song Sparrow, Am. Goldfinch. **Remarks:** Nests found (1 each unless noted): N. Flicker, Fish Crow, Black-capped Chickadee, Tufted Titmouse, Brown Creeper, Wood Thrush (3), Scarlet Tanager, N. Cardinal, Rufous-sided Towhee. Fledglings observed: Broad-winged Hawk, Ruffed Grouse, E. Screech-Owl, Blue Jay, Am. Crow, Am. Robin, Indigo Bunting. Cowbird hosts: Hooded Warbler, Scarlet Tanager, Rose-breasted Grosbeak. The breeding bird density was 14% higher than in 1981, the previous high density. Breeding densities of neotropical migrants increased by 28% over 1982 and were higher than in any former year. Gypsy moth defoliation was negligible, although some egg cases and caterpillars were present. J. D. Montgomery and V. L. Schnerr assisted with the gypsy moth defoliation study. This census is part of a study supported by Pennsylvania Power and Light Co.—*DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.*

192. BRUSHY OLD FIELD WITH HEDGEROWS.

—Location: Indiana; Wayne Co., 1.6 km S of the intersection of U.S. 40 and SW 8th Street; 39°49'N,

84°55'W, Richmond Quadrangle, USGS

Continuity: New. **Size:** 4.33 ha = 10.7 acres (triangular, aerial photograph).

Description of Plot: An old field with hedgerows on 2 sides, which are markedly different from the old field, making the plot heterogeneous. In addition to the 0.1 acre, circular plot method for habitat description, used on the inner portion of the old field, another method was used to describe the hedgerows. Black Cherry and Osage-orange are the most important trees found in the old field while Red Mulberry and Black Cherry dominate the hedgerows. The understory of these hedgerows is predominantly Multiflora Rose, raspberry, blackberry, and Black Cherry saplings. The ground cover is primarily brome grass (*Bromus sp*) and goldenrod. A quantitative analysis gave the following results for all vegetation except the hedgerows: Trees of diameters 7.6 cm (3 in.) and greater, based on 5 circular plots (0.04 ha = 0.1 acre), 79/ha (32/acre); total basal area 1.8 m²/ha (7.8 ft²/acre); 90% of the total number of tree species (figures represent number of trees/ha (number/acre), relative density (%), relative dominance (%), and frequency, in that order) are as follows: Black Cherry 30 (12), 38, 26, 60; Osage-orange 25 (10), 31, 13, 60; Red Mulberry 20 (8), 25, 59, 20. Trees by diameter size class (figures represent number of trees/ha (number of trees/acre), relative density (%), basal area in m²/ha (ft²/acre), and relative dominance (%) in that order): A (3-6 in.), 59 (24), 75, 0.8 (4.8), 31, B (6-9 in.) 15 (6), 19, 0.3 (3.6), 23; (15-21 in.) 5 (2), 6, 1.6 (7.2), 46. Shrubs stems/acre 3400; ground cover 100%; canopy cover 9%, average canopy height 7 m (24 ft) (range 4.5 = 12 m). Hedgerow: Trees 7.6 cm (3 in.) in diameter and greater, 27 trees/100 m hedge-row (8 trees/100 ft), total basal area 0.7 m²/100 m (2.3 ft²/100 ft) of hedgerow. Species representing 90% of the total number of trees (trees/100 m hedge-row (trees/100 ft), relative dominance (%)); Red Mulberry 3 (1), 35, Black Cherry 3 (1), 32; Osage-orange 2 (<1), 14; Hackberry 2 (<1), 9. Ground cover 85%, average canopy height 7.5 m (25 ft) (range 4.5-10 m). **Edge:** Border includes hedgerow on N and W sides with corn and soybean fields, respectively, beyond. The SE border is a paved road (Abington Pike) with brushy old field beyond. **Topography:** Level with shallow valley through W end. **Elevation:** 950 ft. **Weather:** Slightly less precipitation than usual; temp. 60°-70°F. **Coverage:** June 9-10, 14, 16-17, 20, 22-23, 27, 29-30; 0500-0830 hours. Total obs.-hours: 14. **Census:** Indigo Bunting, 6 (139, 56); Am. Robin, 5 (115, 47), Song Sparrow, 4.5 (104, 42); N. Cardinal, 3 (69, 28); Field Sparrow, 3; Am. Goldfinch, 3, White-eyed Vireo, 2; Red-winged Blackbird, 1.5; N. Bobwhite, 1; Gray Catbird, 1; Com. Yellowthroat, 1; Brown-headed Cowbird, 1. **Total:** 12 species; 32 territorial males or females (739/km², 299/100 acres). **Visitors:** Yellow-billed Cuckoo, Vesper Sparrow, Com. Grackle. **Remarks:** Nest located: Song Sparrow with 1 Brown-headed Cowbird egg. I thank M. Hagan, P. Ode and D. Salem for their help in data collection and William H Buskirk and James B. Cope for their consulta-

tion —A WHITMAN MILLER, Biol Dept and Joseph Moore Museum, Earlham College, Richmond, IN 47374.

193. CORN STUBBLE WITH HEDGE-ROW. — **Location:** Indiana; Wayne Co., 0.4 km S of the intersection of U.S. 40 and SW 8th Street; 39°49'N, 84°55'W, Richmond Quadrangle, USGS. **Continuity:** New. **Size:** 6 60 ha = 16.3 acres (rectangular, aerial photograph). **Description of Plot:** Almost entirely corn stubble (last year's harvested corn stalks). The S border includes a vegetated fence line. The hedgerow is dominated by Hackberry. The understory is comprised of Hackberry, Black Cherry saplings and Multiflora Rose, while the ground cover is almost completely brome (*Bromus* sp.) and goldenrod. The following method was used to describe the fence line vegetation: each tree was measured (multiple-trunked trees were measured by recording only the trunk with the largest dbh measurement). Tree data are presented as averages per 100 m (100 ft) of fence line. Although this is not a measure of true density, it yields convenient units for comparison. The number of trees/100 m (number of trees/100 ft), basal area in m²/100 m fence line (ft²/100 ft), relative dominance (%), average canopy height in m (ft) and percent ground cover are presented. Trees 7.6-cm (3-in.) diameter and greater, 46 trees/100m (14 trees/100 ft) of hedgerow; total basal area 2.1 m²/100 m (6.8 ft²/100 ft) of hedgerow. Tree species representing 90% of the total number of trees (trees/100 m (trees/100 ft) of hedgerow, relative dominance (%)). Hackberry 23 (7), 69, Black Cherry 7 (2), 18; Black Walnut 3 (1) 4. Trees by diameter size class (same order as above): A (3-6 in.) 22 (6), 39; B (6-9 in.) 13 (4), 7; C (9-15 in.) 10 (3), 24; D (15-21 in.) 3 (1), 7; E (21-27 in.) 2 (<1), 2. Ground cover 85%, average canopy height 12.5 m (41 ft) (range 9-15 m). **Edge:** Bordered on N by paved road and horse pasture beyond, on E by paved road and housing development, on W is contiguous with Census 194, and on S the border includes a hedgerow with a corn field beyond. **Topography:** Level. **Elevation:** 950 ft. **Weather:** Slightly less precipitation than usual; temp. 60°-75°F. **Coverage:** June 9-10, 14, 16-17, 20, 22-23, 27, 29, 30; 0500-0830 hours. Total obs.-hours: 10. **Census:** Am. Robin, 3 (45, 18); Indigo Bunting, 2.5; N. Cardinal, 2; Brown Thrasher, 1; Field Sparrow, 1; House Wren, 0.5; **Total:** 6 species; 10 territorial males (152/km², 61/100 acres). **Visitors:** N. Bobwhite, Mourning Dove, Blue Jay, Eur. Starling, Song Sparrow, E. Meadowlark, Com. Grackle. **Remarks:** No nests were discovered while walking the field furrow by furrow. Apparently no birds nested within the corn stubble, but hedgerow nesters used it as feeding area. I thank James B. Cope and William H. Buskirk.—A. WHITMAN MILLER, Biol. Dept. and Joseph Moore Museum, Earlham College, Richmond, IN 47374.

194. MIXED HABITAT SECOND GROWTH AND OLD FIELD. — **Location:** Indiana; Wayne Co., 1 km S of intersec-

tion of U S 40 and SW 8th Street, 39°49'N, 84°55'W, Richmond Quadrangle, USGS. **Continuity:** New. **Size:** 11.13 ha = 27.5 acres (rectangular, aerial photograph). **Description of Plot:** Comprised of 3 main sections, each composed of different dominant species. One section, approximately 3.8 ha (9.5 acres) of 14-year-old abandoned field, is dominated by a dense stand of Black Cherry. The most common shrubs and bushes of the understory are raspberry and Multiflora Rose. The ground cover is diverse and consists of various grasses, forbs, and mosses. A second section is approximately 5.3 ha (13 acres) of older second growth, composed of diverse hardwoods, Garlic Mustard and sweet cicely are most conspicuous in the understory. The final section is approximately 2 ha (5 acres) of old field which is dominated by brome (*Bromus* sp.), goldenrod and Poison Ivy. A quantitative vegetative analysis showed the following results: Trees of 7.6-cm (3-in.) diameter and greater, from 8 circular plots (0.04 ha = 0.1 acre) distributed by stratified random sampling, 452/ha (183/acre); total basal area 9.6 m²/ha (41.6 ft²/acre). The trees which represent 90% of the total number of trees (figures represent number of trees/ha (number/acre), relative density (%), relative dominance (%), and frequency) are as follows: Black Cherry 193 (78), 43, 38, 88; Slippery Elm 79 (32), 18, 15, 38; White Ash 32 (13), 7, 4, 50; Osage-orange 22 (9), 5, 4, 38; Hackberry 22 (9), 5, 24, 12; Rock Elm 20 (8), 4, 2, 25; hawthorn 20 (8), 4, 2, 50. Trees by diameter size class (figures represent number of trees/ha (number of trees/acre), relative density (%), basal area in m²/ha (ft²/acre), and relative dominance (%) in that order): A (3-6 in.) 331 (134), 74, 4.0 (17.4) 32; B (6-9 in.) 86 (35), 19, 3.0 (13.1), 24; C (9-15 in.) 30 (12), 6, 2.8 (12.2), 22; D (15-21 in.) 2 (1), 1, 0.7 (3.0), 6; F (27-33 in.) 2 (1), 1, 1.9 (8.3), 15. Shrub stems/acre 2900; ground cover 92%; canopy cover 64%; average canopy height 10.5 m (35 ft) (range 5.5-21 m). **Edge:** Bordered on N and W sides by slightly older forest, on S by agricultural fields (soybean) and on E by agricultural field. **Topography:** Mostly level but with a small rise to the S and E borders. **Elevation:** 950 ft. **Weather:** Slightly less precipitation than usual; temp. 60°-75°F. **Coverage:** June 9-10, 14, 16-17, 20, 22-23, 27, 29-30; 0500-0830 hours. Total obs.-hours: 22. **Census:** Am. Robin, 12 (108, 44); N. Cardinal, 12; Indigo Bunting, 10.5 (94, 38); Song Sparrow, 4 (36, 15); Tufted Titmouse, 3.5 (31, 13); Am. Goldfinch, 3.5; Gray Catbird, 3 (27, 11); Field Sparrow, 3; House Wren, 2.5; Carolina Chickadee, 2; Wood Thrush, 2; White-eyed Vireo, 2; Com. Yellowthroat, 2; Rufous-sided Towhee, 2; Brown-headed Cowbird, 2; N. Bobwhite, 1; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; Blue Jay, 1; Yellow Warbler, 1; Ovenbird, 1; Red-winged Blackbird, 1; N. Oriole, 1; Red-bellied Woodpecker, 0.5; N. Flicker, 0.5. **Total:** 25 species; 75 territorial males or females (674/km², 273/100 acres). **Visitors:** Green-backed Heron, Downy Woodpecker, E. Wood-Pewee, Com. Grackle. **Remarks:** Nests located (4): N. Cardinal (1), House

Wren (2), N. Oriole (1). I thank William H. Buskirk and James B. Cope for their help and guidance during the project.—A. WHITMAN MILLER, Biol. Dept. and Joseph Moore Museum, Earlham College, Richmond, IN 47374.

195. CULTIVATED FIELD I. — **Location:** Iowa; Mills Co., 5 mi N of Hastings; 41°06'N, 95°30'W; Malvern Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 10.6 ha = 26.1 acres. **Description of Plot:** See AB 37:103 (1983). This year the field was planted to corn (*Zea mays*) in 39-inch rows, using no tillage. **Coverage:** May 24; June 17, 21-22, 26-27; July 4. Total obs.-hours: 1.2. **Census:** Vesper Sparrow, 1; E. Bluebird, 0.5; Brown Thrasher, 0.5; Red-winged Blackbird, 0.5; Ring-necked Pheasant, +; N. Bobwhite, +; Killdeer, +; Mourning Dove, +; E. Kingbird, +; W. Meadowlark, +. **Total:** 10 species; 2.5 territorial males (24/km², 10/100 acres). **Visitors:** Barn Swallow. **Remarks:** Nests found: E. Bluebird (2). In the cultivated area, 1 Vesper Sparrow replaced the Dickcissels, yellowthroats, and Red-winged Blackbirds present last year, and this is to be expected when corn replaces oats. One reason for the large number of "+" species was that the fields across the roads on 2 sides were in the set-aside program this year. Several Red-wings, with the other species listed, lived there but sang from the electric power lines along the edge of this field.—BARBARA L. WILSON, Rt. 1, Box 41, Hastings, IA 51540.

196. CULTIVATED FIELD II. — **Location:** Iowa; Mills Co., 5 mi N and 0.5 mi W of Hastings; 41°06'N, 95°31'W; Malvern Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 18.7 ha = 46.2 acres. **Description of Plot:** See AB 37:103 (1983). This year 13.4 acres on top of the hills were planted to Oats (*Avena sativa*), while the rest of the cultivated area was planted to Corn (*Zea mays*) in 39-inch rows using no tillage. **Coverage:** May 23; June 11, 17, 23, 26; July 4. Total obs.-hours: 2.2. **Census:** Ring-necked Pheasant, 1; N. Bobwhite, 1; Vesper Sparrow, 1; Lark Sparrow, 1; House Sparrow, 1; Mourning Dove, +; N. Flicker, +; E. Kingbird, +; W. Meadowlark, +; Red-winged Blackbird, +. **Total:** 10 species; 5 territorial males (27/km², 11/100 acres). **Visitors:** Barn Swallow. **Remarks:** Nests found: House Sparrow (3), Vesper Sparrow (1).—BARBARA L. WILSON, Rt. 1, Box 41, Hastings, IA 51540.

197. FARMSTEAD. — **Location:** Iowa; Mills Co., 4/4 mi N and 3/4 mi W of Hastings; 41°06'N, 95°31'W; Malvern Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 7.7 ha = 19 acres. **Description of Plot:** See AB 37:104 (1983). [I erred in the size classes listed for trees last year. Class C is 9-15 in.; D is 15-21 in.; E is 21-27 in.; F is 27-33 in.; G is 33-40 in.; H is over 40 in.] **Coverage:** Apr. 29; May 14, 20, 23; June 10, 17, 22-23, 27, 29; July 4, 10. Total obs.-hours: 8.9. **Census:** House Sparrow, 65 (845, 342); House Wren, 4.5 (59, 24); Am. Robin, 3.5 (46, 18); Red-headed Woodpecker, 2; Blue Jay, 2; Eur.

Starling, 2, N. Cardinal, 2, Rock Dove, 1, Mourning Dove, 1, Yellow-billed Cuckoo, 1, Downy Woodpecker, 1; N. Flicker, 1; Barn Swallow, 1; Black-capped Chickadee, 1; E. Bluebird, 1; Brown Thrasher, 1; Com. Yellowthroat, 1; W. Meadowlark, 1; Chipping Sparrow, 1; Am. Goldfinch, 1; Red-winged Blackbird, 0.5; N. Oriole, 0.5; Red-bellied Woodpecker, +; Hairy Woodpecker, +; E. Wood-Pewee, +; E. Kingbird, +; Am. Crow, +; White-breasted Nuthatch, +; Cedar Waxwing, +; Indigo Bunting, +. **Total:** 30 species; 95 territorial males ($1236/\text{km}^2$, 500/100 acres). **Visitors:** Chimney Swift, Com. Grackle. **Remarks:** Nests found: House Sparrow (12), Am. Robin (7), House Wren (3), 2 each of Rock Dove, Barn Swallow, and E. Bluebird; 1 each of Red-headed Woodpecker and Brown Thrasher; also 1 brood of Red-winged Blackbirds. The number of House Sparrow nests was calculated by tearing down the nests May 23 and counting all accessible and half the inaccessible nests as active. This year, the sparrows did not nest well after the nests were torn down. We sold our last hogs in December, 1982, and I believe the nearly 50% decrease in nesting House Sparrows is owing to the resultant decrease in food, water, and warmth available to the birds.—BARBARA L. WILSON, Rt. 1, Box 41, Hastings, IA 51540.

198. FLOODPLAIN TALL GRASS PRAIRIE. — **Location:** Iowa; Mills Co., $\frac{1}{2}$ mi N and $\frac{1}{4}$ mi W of Hastings; $41^\circ20'30''\text{N}$, $95^\circ30'00''\text{W}$; Malvern Quadrangle, USGS. **Continuity:** Established 1982. **Size:** 18.4 ha = 45.5 acres. **Description of Plot:** See AB 37:80 (1983). The northern $\frac{1}{3}$ of the prairie was burned May 6. **Coverage:** Apr. 18, 20-22, 27; May 6, 13, 25; June 21, 28; July 6, 26; Aug. 3. Total obs.-hours: 12.8. **Census:** Dickcissel, 16 (87, 35); Com. Yellowthroat, 6 (33, 13); Red-winged Blackbird, 6; Sedge Wren, 5 (27, 11); Grasshopper Sparrow, 2; Ring-necked Pheasant, 1; Am. Goldfinch, 1; Bobolink, 0.5; E. Meadowlark, 0.5; Am. Kestrel, +; E. Kingbird, +; Brown-headed Cowbird, +. **Total:** 12 species; 38 territorial males ($206/\text{km}^2$, 84/100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, N. Flicker, Barn Swallow, Am. Crow. **Remarks:** Nests found: 1 each of Dickcissel and Red-winged Blackbird. The Grasshopper Sparrows were found only before the burn. A flicker fed on the ground in the burned portion of the prairie. Sedge Wrens once again arrived late in July. My thanks to Otha Wearin for permission to study this fine prairie remnant.—BARBARA L. WILSON, Rt. 1, Box 41, Hastings, IA 51540.

199. TALL GRASS PRAIRIE. — **Location:** Nebraska; Douglas Co., Stolley Prairie, 2.5 mi W of Boys Town; $41^\circ16'N$, $96^\circ11'W$; Elkhorn Quadrangle, USGS. **Continuity:** New. **Size:** 8.5 ha = 21.0 acres. **Description of Plot:** See WBPS No. 59. **Coverage:** May 29, June 3, 12, 19; July 3, 17, 24; Aug. 2, 21. Total obs.-hours: 14. **Census:** Dickcissel, 6 (71, 29); Grasshopper Sparrow, 3 (35, 14); Red-winged Blackbird, 3; Ring-necked Pheasant (females), 2; Brown-headed Cow-

bird (♀), 1; E. Kingbird, 0.5; Am. Goldfinch, 0.5; N. Bobwhite, +; Com. Yellowthroat, +. **Total:** 9 species; 16 territorial males or females ($188/\text{km}^2$, 76/100 acres). **Visitors:** Barn Swallow.—NEAL RATZLAFF, 536 Brentwood Road, Omaha, NE 68114.

200. BROME SEEDED DIKES — SEWAGE LAGOONS I. — **Location:** Kansas; Lyon Co., Iowa Beef Processors stabilization ponds adjoining the SW edge of Emporia; Sec. 17, T-19-S, R-11-E, $38^\circ24'N$, $96^\circ14'W$; Emporia Quadrangle, USGS. **Continuity:** New. **Size:** 25.9 ha = 64 acres (measured with planimeter). **Description of Plot:** Four stabilization ponds totaling 52 surface acres of water enclosed by earth and rock dikes that were built between 1968 and 1973. The dikes were seeded to Smooth Brome (*Bromus inermis*) early in their history, and this species accounted for 16% of the plant samples. Other abundant grasses were Meadow Fescue (*Festuca elatior*) and Foxtail Barley (*Hordeum jubatum*). Grasses totaled 56% of the samples. Common forbs in order of frequency in the samples included Com. Ragweed, Com. Sunflower, Wild Peppergrass, Lambs quarters, Pennycress, *Erysimum repandum*, *Euphorbia* sp., Poison-Hemlock, and Com. Cocklebur. **Edge:** Bounded on the S and E by farm ground, on the W by a sanitary landfill, and on the N by a paved road and a railroad yard. **Topography:** Basically flat except for the dikes which are about 45° in slope. **Elevation:** 1150 ft. **Weather:** April, May, and early June were exceptionally wet, then the rest of the summer was exceptionally hot and dry. **Coverage:** May 31; June 9, 20; July 13. All trips in the morning. Total obs.-hours: 6. **Census:** Red-winged Blackbird, 10 (39, 16); Dickcissel, 7 (27, 11); Mallard, 6 (23, 9); Killdeer, 6; Mourning Dove, 3 (12, 4); Blue-winged Teal, 1; N. Bobwhite, 1; E. Meadowlark, +. **Total:** 8 species; 34 territorial males ($131/\text{km}^2$, 53/100 acres). **Remarks:** Nests found: Red-winged Blackbird (2), Mallard (1); and 4 broods of Mallards. A pair of N. Shovelers was present throughout the summer but apparently did not breed. Other visitors: Great Blue Heron, Com. Night-hawk, Purple Martin, Com. Grackle. Workmen mowed a one-row swath once on top of two dikes. The weedy vegetation in some areas got very high and dense.—LAWRENCE HERBERT, R2 Box 126, Olpe, KS 66865.

201. ABANDONED FIELD I. — **Location:** Pennsylvania, Luzerne Co., 2.6 km NNE of Beach Haven and 1.2 km W of Wapwallopen; $41^\circ04'N$, $76^\circ07'W$; Sybertsville Quadrangle, USGS. **Continuity:** Established 1978; 6 consecutive years. **Size:** 6.0 ha = 14.8 acres. **Description of Plot:** See AB 34:102 (1980) and addendum in AB 35:102 (1981). **Weather:** As Census 190, except during counts temp. averaged 62°F (range = 41 - 82°), with variable skies, most often overcast, and no wind until late morning (0-10 mph). **Coverage:** Apr. 22; May 2, 9, 16, 23; June 1, 8, 16; July 1, 22, 29; Aug. 23, 26; Sept. 1, 14; 0500-1000, EST. Total obs.-hours: 46. **Census:** Field Sparrow, 11.5 (192, 78); Com. Yellowthroat, 10.5 (175, 71); Gray Catbird, 6 (100, 41); Am. Goldfinch, 6; Yellow War-

bler, 5 (83, 34); Song Sparrow, 5; Cedar Waxwing, 4 (67, 27); Prairie Warbler, 3 (50, 20); Willow Flycatcher, 2; Yellow-breasted Chat, 2; Rufous-sided Towhee, 2; Brown-headed Cowbird, 2; Eur. Starling, 1.5; Indigo Bunting, 1.5; Blue-winged Warbler, 1; Golden-winged Warbler, 1; White-eyed Vireo, 0.5; Red-tailed Hawk, +; Am. Kestrel, +; E. Kingbird, +; N. Cardinal, +. **Total:** 21 species; 64.5 pairs ($1077/\text{km}^2$, 436/100 acres). **Visitors:** Turkey Vulture, Ruby-throated Hummingbird, N. Flicker, Fish Crow, Am Robin, N. Mockingbird, Brown Thrasher, Red-winged Blackbird, Com. Grackle, N. Oriole. **Remarks:** Nests found: Gray Catbird (4), Cedar Waxwing (4), Eur. Starling (2), Golden-winged Warbler (1), Yellow Warbler (3), Prairie Warbler (1), Yellow-breasted Chat (2), Field Sparrow (5), Song Sparrow (2), Am. Goldfinch (6). Fledglings observed Willow Flycatcher, E. Kingbird, House Wren, Com. Yellowthroat, Rufous-sided Towhee. Cowbird hosts: Yellow Warbler, Field Sparrow. Since 1978 the breeding bird density has increased linearly to a level 3 1 times the original; ground-nesting species increasing by two-fold and limb-nesting species over five-fold. These increases are a result of old field plant succession and corresponding increases in the densities of saplings, shrubs, and vines. Golden-winged and Blue-winged warblers were interspecifically territorial. As in the past few years, waxwings and goldfinches nested late; the former had nestlings as late as Sept. 5 and the latter Sept. 16. V. L. Schnerr assisted with nest-searches and banding. This census is part of a study supported by Pennsylvania Power and Light Co.—DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.

202. ABANDONED FIELD II. — **Location:** Pennsylvania, Luzerne Co., 2.2 km ENE of Beach Haven and 1.2 km W of Wapwallopen; $41^\circ04'N$, $76^\circ07'W$; Berwick Quadrangle, USGS. **Continuity:** Established 1979, 5 consecutive years. **Size:** 4.33 ha = 10.7 acres. **Description of Plot:** See AB 35:102-3 (1981). **Weather:** As Census 190, except that during counts the temp. averaged 58°F (range = 30 - 78°) and the skies variable, but usually overcast, with no wind until late morning (0-11 mph). Clear or partly cloudy days began with fog. **Coverage:** Apr. 21, 29; May 6, 13, 19, 26; June 3, 14, 23; July 6, 26; Aug. 17, 30; Sept. 6, 8; 0450-0845, EST. Total obs.-hours: 35. **Census:** Field Sparrow, 10.5 (242, 98); Song Sparrow, 9 (208, 84); Am. Goldfinch, 4 (92, 37); Willow Flycatcher, 3 (69, 28); Cedar Waxwing, 2.5; Com. Yellowthroat, 2.5; Rufous-sided Towhee, 2.5; Gray Catbird, 2; Yellow Warbler, 2; N. Cardinal, 1; Red-winged Blackbird, 1; Brown-headed Cowbird, 1; Am. Robin, 0.5; Prairie Warbler, 0.5; Red-tailed Hawk, +; E. Kingbird, +; Yellow-breasted Chat, +; Indigo Bunting, +. **Total:** 18 species; 42 pairs ($970/\text{km}^2$, 393/100 acres). **Visitors:** Am. Kestrel, Am. Woodcock, Mourning Dove, Ruby-throated Hummingbird, Barn Swallow, Chipping Sparrow, Com. Grackle. **Remarks:** Nests found: Willow Flycatcher (1), E. Kingbird (1), Am. Robin (1), Cedar Waxwing (4), Yel-

low Warbler (1), Prairie Warbler (1), Rufous-sided Towhee (2), Field Sparrow (6), Song Sparrow (4), Am. Goldfinch (4). Fledglings observed: Com. Yellowthroat, Red-winged Blackbird. Cowbird hosts: Field Sparrow. As in Census 202 the breeding bird density has changed as a result of plant succession, increasing two-fold over 5 years. In this period ground-nesting species have increased by 58% and the limb-nesting species by 210%. This year, for the first time, the 2 most common species, Field Sparrow and Song Sparrow, comprised less than 50% of the total breeding population. Waxwings and goldfinches had nestlings as late as Sept. 6. Common Grackles nested as a colony in nearby pine plantings. V. L. Schnerr assisted in nest-searching and banding. This census is part of a study supported by Pennsylvania Power and Light Co.—DOUGLAS A. GROSS, Ichthyological Associates, Inc., R.D. 1, Berwick, PA 18603.

203. BURNED DISTURBED COASTAL SCRUB.—**Location:** California; Marin Co., 5.5 mi NW of Bolinas and 2 mi inside the S boundary of Point Reyes Nat'l Seashore; 37°56'N, 122°45'W, Double Point Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See WBPS No. 64. **Weather:** See Census 205. **Coverage:** Apr 26; May 2-3, 7-8, 14-16, 22, 24, 26, 28, 31, 0830-1130 except once 1500-1700. Total obs -hours: 42. **Census:** Wrentit, 8 (99, 40); White-crowned Sparrow, 7.5 (93, 37); California Quail, 4 (49, 20); Rufous-sided Towhee, 3.5 (43, 17); Song Sparrow, 2; Scrub Jay, 1.5; Bewick's Wren, 1.5; Anna's Hummingbird, 1; Purple Finch, 1; Am. Goldfinch, 0.5, Allen's Hummingbird, +; Com. Flicker, +, Orange-crowned Warbler, +; House Finch, +. **Total:** 14 species; 30.5 territorial males (377/km², 153/100 acres). **Remarks:** The breeding bird density of this burned but previously disturbed successional stage coastal scrub plot was 64% of the density of mature undisturbed coastal scrub (Census 205), and 74-77% of the density of disturbed but unburned successional stage coastal scrub (Censuses 205 and 206). Those species that tend to reach maximum densities in mature undisturbed coastal scrub were generally present on this plot in much reduced densities. Allen's Hummingbirds, Bewick's Wrens, and Orange-crowned Warblers were particularly scarce while Bushtits and Rufous-crowned Sparrows were absent. Wrentits and Rufous-sided Towhees, however, persisted in relatively good numbers in the small unburned portions of the plot. American Goldfinches and Song Sparrows, which prefer successional stage coastal scrub, the habitat type that was most extensively burned, were also present in very low densities. Only California Quail and White-crowned Sparrows seemed to benefit from the burning. Interestingly, both of these species, in contrast to all of the above, prefer a relatively open foraging beat. To some extent, the relatively high breeding bird density on this burned plot may have been caused by the long narrow shape of the plot that provided it with over 50% more border (relative to its

area) than the unburned plots. This allowed it to intersect more partial edge territories than the other plots. Despite this potential bias toward overestimation of the breeding bird density, it is clear that the occasional burning of California coastal scrub habitat (a periodic and natural phenomenon) does not cause a catastrophic decline in the density of breeding birds. By late April, 8 months after the burning, many of the shrub species had crown sprouted and a luxuriant growth of annual grasses and forbs had developed, thus adding to the plot's attractiveness to birds. Contribution No. 267.—DAVID F. DESANTE, DEBBIE FARKAS, MARYANNE PUENTE, and JAN SUNDBERG, Point Reyes Bird Observatory, 4990 Shoreline Hwy., Stinson Beach, CA 94970.

204. COASTAL SCRUB.—**Location:** California; Marin Co., 4 mi NW of Bolinas and 0.5 mi inside the S boundary of Point Reyes Nat'l Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 11 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 25:1003-1004 (1971). **Weather:** Partly cloudy weather prevailed on 32% of the census mornings; the remaining were clear (27%), overcast (18%), fog (18%), and rain (5%). Winds were generally W or NW at 4-8 knots, about normal. Morning temp. range, 32-82°F (generally 46-64°) and, while considerably warmer than last year, were somewhat cooler than average. Rainfall was excessive for the second consecutive year; the period April-June totalled 5.06 in. This followed an exceptionally wet March (13.96 in.) and reflected the overall excessive rainfall for the year (July 1982-June 1983) of 59.71 in., the wettest year in recorded history! **Coverage:** Apr. 6-7, 11-15, 18, 25-26, 28-29; May 1-3, 6, 8-9, 11, 14-15, 19-20, 23-24, 26, 28, 30-31; June 1-3, 5-6, 8-11, 13-15, 17, 19-26; 0630-1230. Total obs.-hours: 149. **Census:** Wrentit, 10.5 (130, 53); Rufous-sided Towhee, 7.5 (93, 37); Song Sparrow, 6.5 (80, 33); White-crowned Sparrow, 5 (62, 25); Allen's Hummingbird, 4.5 (56, 23); Bewick's Wren, 4 (49, 20); Orange-crowned Warbler, 3 (37, 15); Bushtit, 2.5; Purple Finch, 1.5; Scrub Jay, 1; Rufous-crowned Sparrow, 1; House Finch, 0.5; Red-tailed Hawk, +; Mourning Dove, +; Com. Flicker, +; W. Bluebird, +; Am. Robin, +; Am. Goldfinch, +; Brown Towhee, +; Brown-headed Cowbird, +. **Total:** 20 species; 47.5 territorial males (587/km², 237/100 acres). **Remarks:** The density of this mature coastal scrub plot (587/km²) rebounded remarkably from last year's all time low (488/km²) to a value even greater than the mean density recorded during the previous (1979-81) 3 years (562/km²). In fact, the density was the second highest ever recorded. The densities of all permanent resident species except Bewick's Wren and White-crowned Sparrow increased over last year with the largest increases occurring in Rufous-sided Towhee and Song Sparrow. We attribute these increases (1) to the exceptionally successful 1982 breeding season which caused permanent resident species, especially

Rufous-sided Towhees and Song Sparrows, to be present in record numbers at the start of the winter, and (2) to apparently average to relatively low winter mortality rates as determined by ongoing studies of color-banded birds on this plot. Thus, the exceptionally heavy rainfall of 1982-83, which resulted primarily from a nearly continuous string of warm southerly storms of light or moderate intensity, apparently caused less mortality than the intensely severe northerly storms of 1981-82. Bushtits and Rufous-crowned Sparrows returned as breeding birds after absences of 1 and 3 years respectively, and W. Bluebirds and Brown-headed Cowbirds were recorded as breeding birds for the first time. This caused the highest species richness ever recorded on this plot. In contrast to these increases, Bewick's Wrens decreased from last year's all-time high to more typical densities, but White-crowned Sparrows have been undergoing a long-term decline and their density was only a third of that of a decade ago. The cause of this decline is unknown. The inclement weather during early spring severely retarded and adversely affected breeding success by causing lowered clutch sizes, abandonment of early nests, and low food resource densities for later nests. These factors may also have led to higher-than-average nest predation rates. Nests found (51): Bushtit (2), Wrentit (17), Rufous-sided Towhee (8), Rufous-crowned Sparrow (2), White-crowned Sparrow (10), Song Sparrow (12). Contribution No. 264, PREBO.—DAVID F. DESANTE, DAVE FORTNA, GEOFF GEUPEL, DAVID SIEMENS, and PAUL SUPER, Point Reyes Bird Observatory, 4990 Shoreline Hwy., Stinson Beach, CA 94970.

205. 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; 11 intermittent years. **Size:** 4.7 ha = 11.6 acres. **Description of Plot:** See AB 26:987-988 (1972). **Weather:** See Census 204. **Coverage:** Apr. 1-12, 14-18, 20-22, 25-26, 28; May 1-3, 6-9, 12-14, 16-17, 19-20, 23-24, 26, 30; June 3, 6-12, 14-15, 18-20, 24-25, 27-30; 0630-1300. Total obs.-hours: 173. **Census:** Song Sparrow, 9.5 (202, 82); Wrentit, 3.5 (75, 30); White-crowned Sparrow, 2; Allen's Hummingbird, 1.5; Am. Goldfinch, 1.5; California Quail, 1; Anna's Hummingbird, 1; Bewick's Wren, 1; Rufous-sided Towhee, 1; Scrub Jay, 0.5; Bushtit, 0.5; Orange-crowned Warbler, 0.5; Brown Towhee, 0.5; Red-tailed Hawk, +; Mourning Dove, +; Com. Flicker, +; W. Bluebird, +; Am. Robin, +; Brown-headed Cowbird, +; Purple Finch, +; House Finch, +. **Total:** 21 species; 24 territorial males (511/km², 207/100 acres). **Remarks:** The breeding bird density of this successional stage coastal scrub plot (511/km²) showed a 75% recovery from last year's low (404/km²) toward the previous (1979-81) 3 years' mean (547/km²). This partial recovery contrasts with the complete recovery (actually 134%) found in the mature undisturbed coastal scrub

(BBCs continued on p. 134)