

# Forty-first Breeding Bird Census

Edited by Willet T. Van Velzen

In keeping with the trend of the past few years, this year's total of 179 census reports is an all-time record, representing 35 states/provinces. An amazing total of 48 censuses were reported from California, more than twice the number generally reported for the highest state total in other years. West Virginia was second highest, with 13 censuses, and North Dakota third, with 11.

In addition to having the highest total, this year's census covered the greatest variety of habitats ever studied by the Breeding Bird Census. The wide range of new habitats sampled in California alone represents a unique variety of desert and scrub types.

A tremendous amount of effort was given to this year's census, totaling 4630 man-hours of census work alone, not to mention the additional time spent in setting up and measuring plots. This effort, averaging 25.6 hours per census plot, was applied to a total area of 2704 hectares of habitat (an average of 14.9 ha/plot).

The total number of species recorded per plot ranged from 0 to 66 and averaged 19.6.

Typical of past years, 52% of the studies were new, 65% have been done 1 or 2 years and 81% have been done from 1 to 5 times.

Two weather factors were frequently mentioned as affecting the results of this year's census; the extreme drought conditions that occurred throughout much of the Midwest and West and the severe winter weather of 1976-77, which apparently decimated populations of species such as the Carolina Wren in much of its northern range throughout the East. It will be interesting to follow the recovery of these birds in following years.

A special word of thanks is extended to all those workers who took such care in preparing their manuscripts and submitted them ahead of the deadline date.

The deadline for 1978 is September 1.

— 21510 45th St., S.E. Bothell, WA 98011

## List of Censuses

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs. Obs.	Species	Yrs of Study
<b>A. Eastern-Deciduous Forest</b>						
1. Birch — Maple — Oak Forest	Connecticut	13.9	445	16	30	2
2. Second-growth Hardwood Forest	Connecticut	10.1	806	17	36	11
3. Lowland Oak — Beech — Maple Forest	New York	8.1	1544	20	26	2
4. Maple — Oak Forest	New York	72.8	292	40	60	1
5. Mature Red Oak — Sugar Maple Forest	New York	8.1	877	13	28	1
6. Young Red Maple — Gray Birch Forest	New York	8.1	1248	13	33	2
7. Young White Ash — Basswood Forest	New York	8.1	1285	18	37	2
8. Birch — Maple — Oak Forest	Pennsylvania	9.0	662	30	25	4
9. Mountain Top, Oak — Maple Forest	Pennsylvania	6.1	461	13	21	4
10. Oak — Maple Forest	Pennsylvania	6.1	255	7	11	1
11. Locust — Cherry Woodland	West Virginia	6.1	288	14	22	1
12. Oak — Hickory Forest	West Virginia	6.1	239	11	19	3
13. Oak — Hickory — Locust Forest	West Virginia	6.1	395	10	16	1
14. Oak — Hickory — Red Maple Forest	West Virginia	6.1	231	22	19	1
15. Oak — Maple — Birch Forest	West Virginia	6.1	198	8	15	1
16. Red Oak — Maple — Birch Forest	West Virginia	6.1	297	8	17	1
17. Second-growth Oak — Maple Forest	West Virginia	6.1	297	12	15	1
18. Deciduous Forest with Pond and Brook	New Jersey	16.2	290	10	30	14
19. Hickory — Oak — Ash Floodplain Forest	Maryland	18.4	1073	27	42	6
20. Mature Deciduous Floodplain Forest	Maryland	7.6	929	34	22	25
21. Mature Tulip-tree — Oak Forest	Maryland	14.6	813	23	22	4
22. Mixed Hardwood Forest	Maryland	11.3	1403	22	54	15

	<i>Habitat</i>	<i>State or Province</i>	<i>Hec-tares</i>	<i>Pairs per sq. km.</i>	<i>Hrs Obs.</i>	<i>Spe-cies</i>	<i>Yrs of Study</i>
23	Selectively Logged Mature Tulip-tree — Oak Forest	Maryland	14.2	1119	28	35	3
24	Upland Tulip-tree — Maple — Oak Forest	Maryland	12.0	826	20	36	7
25	Mixed Upland Habitat	Dist. of Columbia	14.2	946	41	25	18
26	Coastal Disturbed Floodplain	Virginia	8.1	198	19	24	2
27	Upland Oak — Hickory Forest	Virginia	11.0	718	69	22	5
28	Floodplain Forest	North Carolina	13.0	797	23	24	1
29	Mixed Deciduous Forest	North Carolina	12.6	590	26	26	2
30	Mixed Deciduous Forest	North Carolina	8.8	618	20	24	5
31	Mountain Ravine Mixed Forest	Georgia	5.9	855	58	26	9
32	Mixed Forest	Ontario	10.1	435	50	28	1
33	Wooded City Ravine	Ontario	20.0	245	19	18	8
34	Aspen — Birch Forest	Minnesota	20.5	234	18	21	1
35	Mature Aspen — Northern Hardwoods Forest	Minnesota	17.0	256	17	20	1
36	Upland Maple — Oak Forest	Wisconsin	5.4	509	20	21	1
37	Mature Mixed Hardwood Forest	Michigan	9.3	820	18	31	4
38	Oak — Hickory — Maple Forest	Illinois	13.0	242	14	26	2
39	Upland Deciduous Forest	Illinois	6.2	501	15	24	2
40	Black Oak — Sassafras Woods	Indiana	22.2	229	68	17	4
41	Poorly Drained Mixed Oak Forest	Indiana	11.1	398	15	26	2
42	Mixed Hardwood Regenerating	Ohio	20.2	242	27	49	1
43	Mixed Mesophytic Forest	Ohio	101.2	161	40	52	2
44	Virgin Beech — Maple Forest	Ohio	6.1	1285	30	32	5
45	Virgin Scrub Oak Foothills	Oklahoma	16.2	293	21	28	3
<b>B.</b>	<b>Eastern — Coniferous-Deciduous (Mixed)</b>						
46	Deciduous — Coniferous Second-growth Northwoods	Vermont	15.0	317	31	23	6
47	Maple — Pine — Oak Second-growth Forest	Massachusetts	11.8	504	26	28	2
48	Climax Hemlock — White Pine Forest with Transition Hardwoods	Connecticut	10.5	841	21	33	11
49	Upland Mixed Pine — Spruce — Hardwood Plantation	New York	16.6	518	16	31	4
50	Mountain Top, Mixed Hardwood — White Pine Forest	Pennsylvania	6.1	502	18	20	4
51	Oak — Pine Forest	West Virginia	6.1	346	10	20	1
52	Oak — Pine Forest	West Virginia	6.1	329	7	22	1
53	Oak — Pine — Hickory Forest	West Virginia	6.1	148	8	16	1
54	Oak — Pine Woodland	West Virginia	6.1	214	13	16	1
55	Central Hardwood Forest with Scattered Pine	Dist. of Columbia	26.3	293	82	21	18
56	Mixed Oak — Pine and Swamp Forest	North Carolina	10.1	257	34	11	2
57	Tamarack Bog and Hardwood	Michigan	8.5	235	9	18	2
58	Mixed Pine — Hardwood Forest	Texas	6.3	475	8	13	4
<b>C.</b>	<b>Eastern — Coniferous</b>						
59	Upland Scotch Pine Plantation	New York	9.3	1042	22	23	9
60	Young Spruce Forest	Maine	5.1	860	20	23	1
<b>D.</b>	<b>Eastern — Mixed Habitats</b>						
61	Mixed Forest, Old Field and Homesite	Vermont	10.9	1400	22	49	4
			10.9	1135	22	44	5
62	Abandoned Nursery with Hedgerows	Connecticut	14.2	778	25	27	1
63	Mixed Upland Habitat and Swamp	Connecticut	14.2	886	39	30	10
64	Upland Brushy Pasture	Connecticut	8.5	1247	16	31	11
65	Abandoned Pasture — Young Mixed Forest	New York	3.4	552	5	20	1
			3.4	610	5	22	2
66	Mixed Upland Habitat	Pennsylvania	7.8	1081	26	30	1
67	Mountain Top Bog with Mixed Hardwood and Evergreen Edge	Pennsylvania	6.1	593	14	25	4
68	Old Field — Meadow and Primary Deciduous Thickets	Pennsylvania	10.1	361	25	21	4
69	Overgrown Field	West Virginia	6.1	354	17	19	1
70	Wooded Pasture	West Virginia	6.1	255	5	19	1

<i>Habitat</i>	<i>State or Province</i>	<i>Hec-tares</i>	<i>Pairs per sq. km.</i>	<i>Hrs Obs.</i>	<i>Spe-cies</i>	<i>Yrs of Study</i>
71 Disturbed Oak — Hickory Forest, Pine Stand, Edge, and Pond	Ohio	14.2	593	35	39	39
72 Mixed Habitat	Ohio	28.3	462	35	52	2
73 Railroad, Lightly Used	Ohio	8.6	746	30	21	1
74 Hackberry — Blue Ash — Chestnut Oak Savannah and Old Fields	Ontario	28.3	161	17	24	1
75 Mixed Swamp and Abandoned Field	Ontario	4.9	947	28	38	1
76 Old Field with Deciduous Regrowth and Young Conifer Plantations	Ontario	42.0	338	33	39	1
77 Aspen Clearcut	Minnesota	10.4	851	29	27	1
78 Mixed Wetland with Tamarack and Aspen Groves, Shrubland and Fen	Wisconsin	16.9	702	21	28	1
79 Deciduous Clearcut	Tennessee	20.2	262	13	17	3
80 Pastures with Brush, Wooded Strips and Scattered Trees	Tennessee	8.7	517	21	30	1
81 Deciduous Clearcut	Georgia	6.9	320	21	8	1
<b>E. Central — Prairie</b>						
82 Disturbed Mixed Prairie	Illinois	16.0	206	104	18	3
83 Kentucky Blue Grass Prairie	North Dakota	4.8	83	2	6	6
		4.8	62	2	5	6
84 Mixed Prairie I	North Dakota	10.0	215	7	13	6
85 Mixed Prairie II	North Dakota	6.1	82	2	7	6
86 Mixed Prairie III	North Dakota	6.1	90	2	7	6
		6.1	49	2	6	6
87 Mixed Prairie IV	North Dakota	6.1	98	3	8	6
88 Mixed Prairie V	North Dakota	6.1	123	3	10	6
89 Mixed Prairie VIII	North Dakota	8.7	75	3	7	2
90 Sandhill Prairie	Kansas	32.4	162	35	18	9
<b>F. Central — Disturbed Habitats</b>						
91 Mixed Habitat — Disturbed Bottomland	Oklahoma	40.5	326	45	41	6
<b>G. Western — Deciduous</b>						
92 Floodplain Cottonwood Forest	Colorado	9.7	1776	37	29	7
93 Floodplain Cottonwood Forest	Colorado	52.2	312	19	23	5
94 Sycamore — Coast Live Oak Riparian Woodland	California	6.8	1500	62	32	2
95 Sycamore — Coast Live Oak Riparian Woodland	California	7.2	861	26	21	1
96 Willow Riparian	California	3.7	1285	32	8	1
97 Willow Riparian I	California	2.3	3208	32	13	1
98 Willow Riparian II	California	3.9	1829	53	20	1
<b>H. Western — Coniferous-Deciduous (Mixed)</b>						
99 Open Aspen Grove — Scattered Conifers	Colorado	14.0	446	22	37	2
100 Ponderosa Pine — Scrub Oak — Mahogany Woodland	Colorado	8.1	383	43	14	10
101 California-Bay — Bishop Pine — Mixed Forest	California	11.7	605	21	26	6
102 Douglas-fir — Oak — Mixed Evergreen Forest	California	7.9	678	90	21	1
<b>I. Western — Coniferous</b>						
103 Ponderosa Pine Forest	Colorado	8.1	469	15	11	14
104 Pinyon — Juniper — Ponderosa Pine Ecotone	New Mexico	36.9	176	32	19	1
105 White Fir — Douglas-fir Forest	Utah	30.0	304	48	17	1
106 Bishop Pine Forest	California	10.5	613	23	25	8
107 Disturbed Bishop Pine Forest	California	12.0	928	26	26	5
108 Limber Pine Forest	California	21.0	196	53	13	1
109 Logged Douglas-fir Reseeded with Monterey Pine	California	8.2	1107	30	34	6
110 Northern Pinyon Pine Woodland	California	27.8	194	50	11	1
111 Pinyon — Juniper Woodland	California	9.0	100	24	13	1
<b>J. Western — Mixed Habitats</b>						
112 Cottonwood Riverbottom — Pasture	Colorado	71.6	296	20	34	5
113 Mixed — Mesophytic Canyon Bottom	New Mexico	12.1	885	100	35	2
114 Farm with Ponds	Utah	10.5	608	27	21	2

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs Obs.	Species	Yrs of Study
115. Scattered Mixed Coniferous Forest	Oregon	32.4	205	40	14	5
116. Digger Pine Parkland	California	9.1	298	16	14	1
117. Urban Nature Center	California	34.4	285	61	18	2
118. Willow Woodland — Freshwater Marsh	California	2.9	1476	13	13	1
<b>K. Western — Desert and Scrub</b>						
119. Creosotebush Wash	Texas	15.6	147	19	7	1
120. Blue Grama — Rabbitbrush Grassland	New Mexico	16.2	90	22	5	1
121. Creosotebush Desert Scrub	Arizona	19.5	8	8	5	1
122. Paloverde Desert Scrub	Arizona	12.2	70	6	12	1
123. Pygmy Forest — Chaparral	Utah	16.2	358	21	17	1
124. Sagebrush Flat	Wyoming	12.3	383	12	8	1
125. Cheesebush — Goldenbush Scrub	California	12.5	144	16	4	1
126. Coastal Sage Scrub	California	9.0	350	20	9	1
127. Coastal Scrub	California	8.1	519	23	12	6
128. Creosote — Brittlebush, Rocky Hillside	California	20.0	12	29	2	1
129. Creosote — Goldenhead Desert Scrub	California	36.0	44	22	4	1
130. Desert Riparian	California	3.7	1285	32	8	1
131. Disturbed Coastal Sage	California	5.6	485	37	10	1
132. Disturbed Coastal Scrub (A)	California	4.7	298	22	12	5
133. Disturbed Coastal Scrub (B)	California	8.1	192	20	14	6
134. Joshua Tree Woodland I	California	11.9	185	16	9	1
135. Joshua Tree Woodland II	California	9.0	72	24	8	1
136. Mesquite — Saltbush	California	20.3	64	24	6	1
137. Mesquite Woodland	California	20.0	412	31	10	1
138. Mohave Yucca — Staghorn Cholla Desert Scrub	California	20.0	60	24	15	1
139. Ocotillo — Creosotebush Scrub	California	20.0	15	22	4	1
140. Rabbitbrush	California	6.0	0	32	0	1
141. Sagebrush Scrub I	California	21.0	19	24	3	1
142. Sagebrush Scrub II	California	21.0	38	24	5	1
143. Census withdrawn						
144. Census withdrawn						
145. Saltbush Desert	California	36.0	64	20	2	1
146. Scrub Oak — Desert Chaparral	California	20.0	105	30	16	1
147. Tamarisk — Desert Riparian	California	35.0	106	32	23	1
148. Tamarisk — Saltbush	California	18.5	27	24	5	1
149. Undisturbed Coastal Sage Scrub	California	4.4	703	26	13	1
150. Silver Sagebrush Flat	Montana	24.0	246	18	17	1
151. Silver Buffaloberry — Red Osier Dogwood Coulee	Montana	25.0	192	19	16	1
152. Silver Buffaloberry — Silver Sagebrush Coulee	Montana	25.0	136	18	12	1
153. Needle-and-thread — Blue Grama Grassland	Montana	25.0	96	16	7	1
154. Western Wheatgrass — Blue Grama Pasture	Montana	25.0	48	16	7	1
<b>L. Wetlands</b>						
155. Shrubby Swamp and Sedge Hummocks	Connecticut	8.1	2403	20	22	11
156. Nine Small Ponds	Ohio	20.2	395	48	23	1
157. Cattail — Bulrush Wetland I	North Dakota	6.4	1001	6	9	1
158. Cattail — Bulrush Wetland II	North Dakota	7.3	3418	7	11	1
159. Cattail — Bulrush Wetland III	North Dakota	5.0	2170	5	13	1
160. Bulrush Wetlands	North Dakota	5.6	1582	7	9	1
161. Bulrush and Cattail Marsh in Conifer Forest	Montana	40.5	687	62	66	3
162. Floodplain Pond	Colorado	8.5	318	5	3	4
163. Cattail Marsh	California	5.2	2909	23	12	1
164. Desert Marsh	California	5.7	315	24	5	1
165. Desert Riparian — Freshwater Marsh and Ponds	California	15.4	488	27	37	1
166. Disturbed Coastal Salt Marsh	California	8.7	220	26	3	1
167. Tamarisk-Quailbrush Marsh	California	21.5	70	24	12	1

Habitat	State or Province	Hectares	Pairs per sq. km.	Hrs Obs.	Species	Yrs of Study
<b>M. Northern-Taiga and Tundra</b>						
168 Arctic Low Foothills Tundra	Alaska	25.0	272	61	18	1
169 Wet Coastal Plain Tundra I	Alaska	33.0	111	41	10	3
170 Wet Coastal Plain Tundra II	Alaska	27.0	109	49	10	3
171 Wet Coastal Tundra I	Alaska	29.8	133	31	14	1
172 Wet Coastal Tundra II	Alaska	25.0	116	46	8	1
<b>N. Fields and Cultivated Areas</b>						
173 Old Field	Pennsylvania	7.1	633	8	21	4
174 Orchard Grass — Timothy Field	Pennsylvania	12.7	189	20	15	1
175 Abandoned Field	Maryland	6.1	511	22	13	6
176 Orchard Grass — Tall Fescue Meadow	Illinois	12.1	255	10	10	2
177 Annual Grassland	California	12.6	127	47	5	1
178 Annual Grassland	California	8.1	173	12	5	2
<b>O. Residential</b>						
179 Residential Area	North Carolina	10.1	435	34	14	1
180 Urban Residential	Ontario	25.5	198	16	13	1
181 Village Residential	Ohio	16.2	599	65	14	1

**1. BIRCH-MAPLE-OAK FOREST.** — **Location:** Connecticut; New London Co., 1 mi NNW of intersection of state routes 161 and 156; 40°20'N, 72°12'W, Niantic Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 13.94 ha = 34.44 acres. **Description of Plot:** See AB 31:29 (1977) **Weather:** Normal spring, very hot July and early August. **Coverage:** April 25; May 7, 14, 18, 21, 27; June 14. Total man-hours: 16.2. **Census** (territorial males, followed in parentheses by males/km<sup>2</sup> and males/100 acres) Rufous-sided Towhee, 8 (57, 23); Canada Warbler, 6 (43, 17); Gray Catbird, 4 (29, 12); Wood Thrush, 4; Veery, 4; Black-and-white Warbler, 4; Great Crested Flycatcher, 3 (22, 9); Blue Jay, 3; Red-eyed Vireo, 3; Black-capped Chickadee, 2; Tufted Titmouse, 2; Brown Thrasher, 2; Scarlet Tanager, 2; Cardinal, 2; Ruffed Grouse, 1; Mourning Dove, 1; Great Horned Owl, 1; Com Flicker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Worm-eating Warbler, 1; Blue-winged Warbler, 1; Ovenbird, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 1; Brown-headed Cowbird, 1 (female); N. Oriole, 1; Hairy Woodpecker, +; White-breasted Nuthatch, +; Rose-breasted Grosbeak, +. **Total:** 30 species; 62 territorial males or females (445/km<sup>2</sup>, 180/100 acres).

**Remarks:** No nests were found. There was a large decrease in the number of species and territorial males. The number of warblers dropped greatly. There were no Hooded Warblers or redstarts present. The only warblers that did not decrease were the Canada and Black-and-white. Other birds not present were House Wren which decreased from 6 to 0 pairs, E. Phoebe (2 to 0), White-eyed Vireo (2 to 0), Ruby-throated Hummingbird (1 to 0), Dark-eyed Junco (1 to 0), White-throated Sparrow (1 to 0), Brown Creeper, Am. Robin and Louisiana Waterthrush — ANDREW DASINGER, 12 Stone Cliffe Drive, Niantic, Conn. 06357.

**2. SECOND-GROWTH HARDWOOD FOREST.** — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris, 41°42'26"N, 73°12'22"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 11 intermittent years. **Size:** 10.1 ha = 25 acres. **Description of Plot:** See AFN 19:590-591 (1965). **Coverage:** June 3-5, 8, 13, 16-17; 0700-1930 hours. Total man-hours: 17. **Census:** Red-eyed Vireo, 10 (99, 40); Ovenbird, 9 (89, 36); Veery, 8 (79, 32); Am. Redstart, 7.5 (74, 30); Rufous-

sided Towhee, 5 (49, 20); Com. Yellowthroat, 4.5 (44, 18); E. Wood Pewee, 3 (30, 12); Black-capped Chickadee, 3; Tufted Titmouse, 3; Downy Woodpecker, 2; Blue Jay, 2; White-breasted Nuthatch, 2; Brown Creeper, 2; Gray Catbird, 2; Wood Thrush, 2; Song Sparrow, 2; Com Flicker, 1.5; Chestnut-sided Warbler, 1.5; Broad-winged Hawk, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; House Wren, 1; Blue-gray Gnatcatcher, 1; Black-and-white Warbler, 1; Blue-winged Warbler, 1; Scarlet Tanager, 1; Brown-headed Cowbird, 1; Com Crow, 0.5; E. Phoebe, 0.5; Am. Robin, 0.5; N. Oriole, 0.5; White-throated Sparrow, 0.5; Barred Owl, +; Mourning Dove, +; Magnolia Warbler, +; Cardinal, +. **Total:** 36 species; 81.5 territorial males (806/km<sup>2</sup>, 326/100 acres). **Remarks:** Losses from the previous year were single Wood Duck, Ruffed Grouse, Yellow-bellied Sapsucker, and Canada Warblers. The number of territorial males remained the same. A daily average of 30 Red-winged Blackbirds (80% males) and 20 Com. Grackles was observed feeding in the plot. Special thanks to Jim Cavanaugh. — ANDREW MAGEE, 34 Hobson St., Springfield, Mass. 01109.

**3. LOWLAND OAK-BEECH-MAPLE FOREST.** — **Location:** New York; Oswego Co., 2 mi S of Oswego, 43°25'N, 76°30'W, Oswego East Quadrangle, USGS. **Continuity:** Established 1974; 2 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 28:991 (1974). **Coverage:** June 6, 8-10, 13, 15-17, 20, 22; 0615-1445. Total: 20 party-hours. **Census:** Red-eyed Vireo, 15 (185, 75); Veery, 12 (148, 60); Am. Redstart, 12; Great Crested Flycatcher, 11 (136, 55); E. Wood Pewee, 11; Wood Thrush, 8 (99, 40); N. Waterthrush, 8; Black-capped Chickadee, 6 (74, 30); Scarlet Tanager, 6; Com Yellowthroat, 5 (62, 25); Rose-breasted Grosbeak, 5; Song Sparrow, 4 (49, 20); Winter Wren, 3 (37, 15); Hairy Woodpecker, 2; White-breasted Nuthatch, 2; House Wren, 2; Gray Catbird, 2; Black-throated Blue Warbler, 2; Ovenbird, 2; N. Oriole, 2; Com. Flicker, 1; Blue Jay 1; Am. Robin 1; Yellow-throated Vireo, 1; Rufous-sided Towhee, 1; Field Sparrow, +. **Total:** 26 species; 125 territorial males (1544/km<sup>2</sup>, 625/100 acres). **Remarks:** Conducted as an ornithology class project. This second census found increases in the numbers of most breeders with decreases only in the N. Oriole, House Wren and Oven-

bird. Man's activities in the area have been minimal until now. I wish to thank the owner, Eben Poland for his permission to use the land for educational purposes, and the class (Denise Fryer, Rosemary Hanagan/Windheim, Shelley June, Ken Karwowski, Catherine Meyers, Randall Olsson, Nancy Roberts, Neil Sabine, Manfried Smith, Victoria Stagnitta, Trooper Studdert, Peggy Trout, James Verrette) for its effort and dedication which made this census possible. — **GEORGE R. MAXWELL II**, Rice Creek Biological Field Station, Dept. of Zoology, State Univ. College, Oswego, N.Y. 13126.

**4. MAPLE-OAK FOREST.** — **Location:** New York; Ulster Co., John Burroughs Nature Sanctuary, 1 mi W of West Park; 41°48'N, 73°58'W, Hyde Park Quadrangle, USGS. **Continuity:** New. **Size:** 72.8 ha = 180 acres (surveyed). **Description of Plot:** The dominant canopy trees are Sugar Maple (*Acer saccharum*) and Red Oak (*Quercus rubra*). Typical understory trees in addition to the above are Spicebush (*Lindera benzoin*) and Hemlock (*Tsuga canadensis*). Ground cover is complicated but contains Christmas Fern (*Polystichum acrostichoides*), sedge species, and Spinulose Woodfern (*Dryopteris spinulosa*). A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, 244/acre; total basal area 57.2 ft<sup>2</sup>/acre. The most abundant species, followed by number of trees/acre, relative density (%), relative dominance, and frequency, were: Sugar Maple, 48, 19, 18, 88; Hemlock, 35, 16, 8, 63; Red Oak, 34, 14, 26, 75; White Ash (*Fraxinus americana*), 25, 10, 12, 88; dead trees, 18, 7, 10, 88; Basswood (*Tilia americana*), 15, 7, 8, 38; Chestnut Oak (*Q. prinus*), 12, 5, 9, 63; Pignut Hickory (*Carya glabra*), 10, 4, 2, 63. Shrub stems/acre 2000; ground cover 31%; canopy cover 46%; average canopy height 54 ft (range 40-70 ft). **Edge:** Surrounded by similar forest. **Topography:** A glaciated (N-S) series of mesic, sandstone watersheds of the Ridge and Valley Province; ranging 150-500 ft. Includes a 10-acre artificial pond. **Coverage:** April 15, 29; May 13, 15, 17, 21, 26, 28; June 1, 3-6, 8, 10, 14, 17, 20; 0445-0800 and occasionally at dusk. Total man-hours: 40. **Census:** Black-and-white Warbler, 19 (26, 11); Red-eyed Vireo, 17.5 (24, 10); Great Crested Flycatcher, 14.5 (20, 8); Black-capped Chickadee, 12 (16, 7); Ovenbird, 11.5 (16, 6); Wood Thrush, 10.5 (14, 6); Louisiana Waterthrush, 10 (14, 6); Worm-eating Warbler, 9 (12, 5); Tufted Titmouse, 6.5 (9, 4); Scarlet Tanager, 6 (8, 3); Cardinal, 6; Downy Woodpecker, 5 (7, 3); E. Wood Pewee, 4.5 (6, 2); Blue Jay, 4 (5, 2); White-breasted Nuthatch, 4; Am. Robin, 4; Red-winged Blackbird, 4; Chipping Sparrow, 4; Com. Flicker, 3.5 (5, 2); E. Phoebe, 3 (4, 2); Blue-gray Gnatcatcher, 3; N. Oriole, 3; Com. Grackle, 3; Rose-breasted Grosbeak, 3; E. Kingbird, 2; Gray Catbird, 2; Golden-winged Warbler, 2; Black-throated Blue Warbler, 2; Cerulean Warbler, 2; Am. Redstart, 2; Indigo Bunting, 2; Am. Goldfinch, 2; Rufous-sided Towhee, 2; Mallard, 1; Black Duck, 1; Wood Duck, 1; Ruffed Grouse, 1; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Screech Owl, 1; Barred Owl, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Least Flycatcher, 1; Barn Swallow, 1; Red-breasted Nuthatch, 1; Brown Creeper, 1; Winter Wren, 1; E. Bluebird, 1; Cedar Waxwing, 1; Yellow-throated Vireo, 1; Solitary Vireo, 1; Blue-winged Warbler, 1; Yellow-rumped Warbler, 1; Black-throated Green Warbler, 1; Com. Yellowthroat, 1; Canada Warbler, 1; Red-tailed Hawk, +; Broad-winged Hawk, +;

Black-billed Cuckoo, + **Total:** 60 species, 212.5 territories (292/km<sup>2</sup>, 118/100 acres). **Remarks:** 12 nests were found: phoebe 3, chickadee 2, and 1 each of Mallard, Black Duck, Red-eyed Vireo, Black-and-white Warbler, Worm-eating Warbler, Ovenbird, and Chipping Sparrow. Young seen being fed: flicker, Pileated and Downy Woodpeckers, kingbird, Barn Swallow, bluebird. — **JIM STAPLETON**, John Burroughs Nature Sanctuary, P.O. #23, West Park, N.Y. 12493.

## 5. MATURE RED OAK-SUGAR MAPLE FOREST.

— **Location:** New York; Jefferson Co., on Wellesley Island 4 mi ENE of the Thousand Islands International Bridge, 44°21'N, 76°56'W, Alexandria Bay Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, paced longitudinally and estimated laterally) **Description of Plot:** A tall, undisturbed woodland with a closed canopy. Most canopy trees averaged 15-21 m in height. There was a 40% understory of shrubs averaging 1 m in height; a 40% herbaceous ground cover, more mature than most forests in nearby sectors. The canopy trees followed by relative density and dbh in cm were Red Oak (*Quercus rubra*), 42%, 57; Sugar Maple (*Acer saccharum*) 16%, 14; Red Maple (*A. rubrum*) 13%, 11, Am. Beech (*Fagus grandifolia*) 9%, 16; White Ash (*Fraxinus americana*) 9%, 15; White Pine (*Pinus strobus*) 7%, 19; Shagbark Hickory (*Carya ovata*) 4%, 16 **Edge:** Bounded on two sides by similar woods and on two sides by young woods and successional areas. **Topography:** Flat to slightly rolling. **Elevation:** 280-300 ft. **Weather:** No precipitation during census and lower than average for season. **Coverage:** May 20, 23, 25; June 1-3, 10-11, 21, 23-24; 0500-2100 EDT. **Total:** 12.5 observer-hours **Census:** Wood Thrush, 8 (99, 40); Am. Redstart, 7 (86, 35), E. Wood Pewee, 6 (74, 30); Red-eyed Vireo, 5 (62, 25), Great Crested Flycatcher, 4 (49, 20); N. Oriole, 4, Rose-breasted Grosbeak, 4; Veery, 3 (37, 15); Scarlet Tanager, 3; Com. Flicker, 2; Least Flycatcher, 2; Com. Crow, 2, Black-capped Chickadee, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Warbling Vireo, 2; Com. Yellowthroat, 2; Great Horned Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; Gray Catbird, 1; Brown Thrasher, 1; Yellow Warbler, 1; Cerulean Warbler, 1, Ovenbird, 1; Com. Grackle, 1; Cardinal, 1. **Total:** 28 species; 71 territorial males (877/km<sup>2</sup>, 355/100 acres) **Visitors:** Com. Snipe, Com. Nighthawk, Chimney Swift, E. Kingbird, Barn Swallow, Tree Swallow, E. Meadowlark, Brown-headed Cowbird, Am. Goldfinch, Swamp Sparrow. **Remarks:** The male Cerulean Warbler was mated, singing on territory and seen carrying food, but the nest was not found. There are no confirmed breeding records for this species along the St. Lawrence River in New York State. This study was funded under U.S. Fish and Wildlife Service contract no. 14-16-0005-6067 — **GEORGE R. MAXWELL II and GERALD A. SMITH**, Rice Creek Biological Field Station, Dept. of Zoology, State Univ. College, Oswego, N.Y. 13126.

## 6. YOUNG RED MAPLE-GRAY BIRCH FOREST.

— **Location:** New York; St. Lawrence Co., 4 mi NE of Waddington at Coles Creek, 44°53'N, 75°07'W, Louisville Quadrangle, USGS. **Continuity:** Established 1976 **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 31 31 (1977). **Weather:** No precipitation during census, a

rather dry season. **Coverage:** May 17, 30, June 4-5, 8, 10, 14, 20; July 7; 0500-2100, EDT. Total: 12.5 man-hours. **Census:** Am. Redstart, 14 (173, 70); Veery, 13 (161, 65); Red-eyed Vireo, 7 (86, 35); N. Oriole, 7; Wood Thrush, 6 (74, 30); Yellow Warbler, 6; White-throated Sparrow, 5 (62, 25); Com. Yellowthroat, 4 (49, 20); Least Flycatcher, 3 (37, 15); Red-winged Blackbird, 3; Song Sparrow, 3; Great Crested Flycatcher, 2; E. Wood Pewee, 2; House Wren, 2; Gray Catbird, 2; Am. Robin, 2; Com. Grackle, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Com. Flicker, 1; Downy Woodpecker, 1; Tree Swallow, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; Starling, 1; Warbling Vireo, 1; Black-and-white Warbler, 1; Nashville Warbler, 1; Chestnut-sided Warbler, 1; Ovenbird, 1; Scarlet Tanager, 1. **Total:** 33 species; 101 territorial males ( $1248/\text{km}^2$ , 505/100 acres). **Visitors:** Great Blue Heron, Killdeer, Spotted Sandpiper, Purple Martin, Com. Crow, Cape May Warbler, Canada Warbler, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** A considerable increase in the variety of breeders was noted over last year, but an overall decrease in total males present occurred. This study was supported by U.S. Fish and Wildlife Service contract no. 14-16-0005-6067. — *GERALD A. SMITH and GEORGE R. MAXWELL II, Rice Creek Biological Field Station, Dept. of Zoology, State Univ. College, Oswego, N.Y. 13126.*

**7. YOUNG WHITE ASH-BASSWOOD FOREST.** — **Location:** New York; St. Lawrence Co., 3 mi SW of Morristown at Jacques Cartier State Park,  $44^\circ 33' \text{N}$ ,  $75^\circ 41' \text{W}$ , Morristown Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 31 31-32 (1977). **Weather:** No precipitation during survey. The season was drier than normal. **Coverage:** May 14; June 2-7, 11, 14, 22-23; 0500-2100, EDT. Total: 17.5 man-hours. **Census:** Yellow Warbler, 10 (124, 50); Veery, 8 (99, 40); Am. Redstart, 8; N. Oriole, 6 (74, 30); Com. Grackle, 6; Am. Robin, 5 (62, 25); Warbling Vireo, 5; Red-winged Blackbird, 5; House Wren, 4 (49, 20); Rose-breasted Grosbeak, 4; E. Wood Pewee, 3 (37, 15); Wood Thrush, 3; Com. Yellowthroat, 3; Song Sparrow, 3; Com. Flicker, 2; Great Crested Flycatcher, 2; Least Flycatcher, 2; Black-capped Chickadee, 2; Gray Catbird, 2; Starling, 2; Ovenbird, 2; Rufous-sided Towhee, 2; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; Tree Swallow, 1; White-breasted Nuthatch, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Yellow-rumped Warbler, 1; Pine Warbler, 1; N. Waterthrush, 1; Cardinal, 1; Indigo Bunting, 1; Chipping Sparrow, 1; White-throated Sparrow, 1. **Total:** 37 species; 104 territorial males ( $1285/\text{km}^2$ , 520/100 acres). **Visitors:** Barn Swallow, Purple Martin, Com. Crow, Cedar Waxwing, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** Five to six female Brown-headed Cowbirds were regularly present. A nearly 30% decrease in total territorial males was noted over last year, while at the same time there was an increase of 9 species occurring as breeders. The greatest decreases were noted in E. Wood Pewee, House Wren, Song Sparrow, and Ovenbird. This study was funded by U.S. Fish and Wildlife Service contract no. 14-16-0005-6067. — *GEORGE R. MAXWELL II and GERALD A. SMITH, Rice Creek Biological Field Station, Dept. of Zoology, State Univ. College, Oswego, N.Y. 13126.*

**8. BIRCH-MAPLE-OAK FOREST.** — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mi S of intersection of State Rte. 228 and Kepple Rd. on Todd Sanctuary;  $40^\circ 44' \text{N}$ ,  $79^\circ 42' \text{W}$ , Freeport Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 9 ha = 22.4 acres. **Description of Plot:** See AB 28:992-993 (1974). **Weather:** Late May hot and dry, first half of June unusually cold; late June, July and August normal temperatures with above normal rainfall. **Coverage:** May 25, 28; June 2, 8, 10; July 2, 11, 15, August 3; 0500-0730. Total man-hours: 30. **Census:** Red-eyed Vireo, 15.5 (171, 69); Wood Thrush, 6 (66, 27); Cardinal, 5.5 (61, 25); Scarlet Tanager, 5 (55, 22); Acadian Flycatcher, 4 (44, 18); E. Wood Pewee, 3 (33, 13); Tufted Titmouse, 2; White-breasted Nuthatch, 2; Blue-gray Gnatcatcher, 2; Kentucky Warbler, 2; Hooded Warbler, 2; Cerulean Warbler, 1.5; Ruffed Grouse, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; Am. Robin, 1; Louisiana Waterthrush, 1; Indigo Bunting, 1; Chipping Sparrow, 1; Ruby-throated Hummingbird, 0.5; E. Phoebe, 0.5; Field Sparrow, 0.5; Black-throated Green Warbler, +; Rufous-sided Towhee, +. **Total:** 25 species; 60 territorial or non-territorial males and females ( $662/\text{km}^2$ , 268/100 acres). **Visitors:** Yellow-billed Cuckoo, Black-billed Cuckoo, Pileated Woodpecker, Hairy Woodpecker, Com. Crow, Ovenbird. **Remarks:** Nests located, E Phoebe, Tufted Titmouse, Cardinal, Indigo Bunting. The number of Red-eyed Vireos increased from 10.5 to 15.5 after dropping from 19 two years ago. Whether this is because of actual population changes or to the difficulty of determining the number of birds heard at one time is unknown. — *R. MICHAEL SLATER, 1323 Powers Run Rd., Pittsburgh, Pa. 15238.*

**9. MOUNTAIN TOP, OAK-MAPLE FOREST.** — **Location:** Pennsylvania; Westmoreland Co., 10 mi SSW of Ligonier, 6 mi S of Laughlintown in Forbes State Forest on the top of Laurel Mountain;  $40^\circ 07' 37'' \text{N}$ ,  $79^\circ 10' 50'' \text{W}$ , Ligonier Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28:993 10 (1974). **Weather:** Sunny, except for one rainy day; mostly warm and clear. **Coverage:** June 4-5, 11-12; 0500-0930, 1200-1300 and 1700-1930. Total party-hours: 13. **Census:** Red-eyed Vireo, 7.5 (124, 50); Ovenbird, 3 (49, 20); Solitary Vireo, 2.5; Dark-eyed Junco, 2.5; Rose-breasted Grosbeak, 2; E. Wood Pewee, 1.5; Am. Robin, 1.5; Scarlet Tanager, 1.5; Chipping Sparrow, 1.5; Black-capped Chickadee, 1; Brown Creeper, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1; Veery, 0.5; Red-shouldered Hawk, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Wood Thrush, +; Hermit Thrush, +; Cedar Waxwing, +. **Total:** 21 species; 28 territorial males ( $461/\text{km}^2$ , 187/100 acres). **Visitors:** House Wren, Black-throated Green Warbler, Blackburnian Warbler, Canada Warbler, Purple Finch. **Remarks:** Red-eyed and Solitary Vireos have increased noticeably and regularly in the 4 years of the survey. A major physical change was the cutting of two herbaceous openings in the forest during the fall of 1974, each measuring approximately 300 x 150 ft; one on either side of the plot but not opposite each other. This probably accounts for the appearance of Chipping Sparrow and Indigo Bunting. A House Wren that was resident last year was not in evidence this year. The openings were cut by the Penn-

Pennsylvania Bureau of Forestry as part of a wildlife management plan. — R. CARRELL ABBOTT (compiler), Audubon Society of Western Pennsylvania, Pittsburgh, Pa 15213.

**10. OAK-MAPLE FOREST.** — **Location:** Pennsylvania, Fayette Co.; 2.9 mi WSW of Elliottsville; 39°46'N, 79°40'45"W, Brownfield Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** A hardwood forest last cut over about 1900-1941. The dominant canopy trees are Chestnut Oak (*Quercus prinus*) and Red Maple (*Acer rubrum*). Most prominent in the understory are Mountain Laurel (*Kalmia latifolia*) and Rhododendron (*Rhododendron maximum*). The ground cover is primarily Teaberry (*Gaultheria procumbens*) and blueberry (*Vaccinium* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 607/acre; total basal area 200.1 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Chestnut Oak, 198, 33, 46, 100; Red Maple, 120, 20, 13, 100; dead trees, 103, 17, 6, 100; White Oak (*Q. alba*), 70, 11, 10.5, 100; Black Oak (*Q. velutina*), 43, 7, 10, 66; Black Gum (*Nyssa sylvatica*), 25, 4, 2, 100. Trees by diameter size class: A (3-6 in.) 310, 51, 31, 15; B (6-9 in.) 180, 30, 54, 27; C (9-15 in.) 100, 16, 80, 40, D (15-21 in.) 16, 3, 30, 15; E (21-27 in.) 1, 1, 5.1, 3. Shrub stems/acre 7,283; ground cover 60%; canopy cover 98%; average canopy height 59 ft (range 49-72). **Edge:** Forest continues on all sides. **Topography:** East facing slope. **Elevation:** 2140-1900 ft. **Weather:** Fair and warm, then fair and cool. **Coverage:** May 26, 28-30; June 4, dawn-0800, 1300-1400, or 1900-1950 hours. Total man-hours: 6.5. **Census:** Red-eyed Vireo, 4 (66, 27); Ovenbird, 4; Black-and-white Warbler, 1.5; Wood Thrush, 1; Solitary Vireo, 1; Black-throated Green Warbler, 1; Hooded Warbler, 1; Rufous-sided Towhee, 1; Scarlet Tanager, 1; Pileated Woodpecker, +; Great Crested Flycatcher, +. **Total:** 11 species; 15.5 territorial males (255/km<sup>2</sup>, 103/100 acres). **Visitors:** Turkey Vulture, Yellow-billed Cuckoo, Downy Woodpecker, Com. Crow, Black-capped Chickadee, Tufted Titmouse, E Wood Pewee, Cardinal. **Remarks:** Special thanks to the following for their help: Glen F. Phillips, Robert K. Ache, Peter Wray, Ruth B. Wilkinson. — M. VIRGINIA JOHNSON, 24 Robinson St., Uniontown, Pa. 15401.

**11. LOCUST-CHERRY WOODLAND.** — **Location:** West Virginia; Ohio Co., 1 1/4 mi E of Greggsville; 40°5'15"N, 80°34'56"W, Wheeling Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are Black Locust (*Robinia pseudo-acacia*) and Black Cherry (*Prunus serotina*). Most prominent in the understory are Multiflora Rose (*Rosa multiflora*) and Spice Bush (*Lindera benzoin*). The ground cover is primarily Sweet Cicely (*Osmorhiza longistylus*) and Ground Ivy (*Glechoma hederacea*). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 305/acre, total basal area 69 ft<sup>2</sup>/acre. Species comprising 94% of the total number of trees: Black Locust, 62, 20, 34, 83; Black Cherry, 58, 19, 22, 83; Am. Elm (*Ulmus americana*), 75, 25, 17, 83; White Ash (*Fraxinus*

*americana*), 55, 18, 11, 50; Boxelder (*Acer negundo*), 17, 6, 2, 67 and dead trees, 20, 6, 8, 83. Trees by diameter size class: A (3-6 in.) 200, 66, 20, 28; B (6-9 in.) 75, 25, 22, 32; C (9-15 in.) 27, 9, 21, 31; D (15-21 in.) 3, 1, 6, 9. Shrub stems/acre 3358; ground cover 53%; canopy cover 81%, average canopy height 60 ft (range 40-81). **Edge:** Bordered by like habitat. **Topography:** A broad ridge oriented ENE-WSW. **Elevation:** 1150 ft. **Weather:** Hot and dry. **Coverage:** May 26-June 2; dawn-0620 or 1900-2015. Total man-hours: 14. **Census:** Rufous-sided Towhee, 4 (66, 27); Indigo Bunting, 3 (49, 20); Cardinal, 2.5; Gray Catbird, 2; Red-eyed Vireo, 2; Wood Thrush, 1.5; Yellow-breasted Chat, 1; Downy Woodpecker, 0.5; Blue-gray Gnatcatcher, 0.5; Field Sparrow, 0.5; Ruffed Grouse, +; Chimney Swift, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Com. Crow, +; Carolina Chickadee, +; Blue-winged Warbler, +; Kentucky Warbler, +; Com. Yellowthroat, +; Hooded Warbler, +; Brown-headed Cowbird, +; Scarlet Tanager, +. **Total:** 22 species; 17.5 territorial males (288/km<sup>2</sup>, 117/100 acres) **Visitors:** Rock Dove, Great Crested Flycatcher, Acadian Flycatcher, Blue Jay, White-eyed Vireo, Song Sparrow **Remarks:** This plot is part of an abandoned hilltop farm recently acquired by Oglebay Park; this study was to document the birds present before any developments are undertaken. — MR. and MRS. GERALD DEVAUL, KATHY DEVAUL, DOROTHY BROEMSEN, CARL SLATER, MARY FORD and GLEN PHILLIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

**12. OAK-HICKORY FOREST.** — **Location:** West Virginia; Pendleton Co., 4.6 mi SE of Franklin, 38°35'32"N, 79°21'54"W, Sugar Grove Quadrangle, USGS. **Continuity:** Established 1963; 3 intermittent years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AFN 17:497 (1963) and 23:707 (1969). The dominant canopy trees are oaks and hickory. Most prominent in the understory are huckleberry (*Vaccinium* sp.) and Laurel (*Kalmia latifolia*). The ground cover is primarily Teaberry (*Gaultheria procumbens*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 226/acre; total basal area 77 ft<sup>2</sup>/acre. Species comprising 91% of the total number of trees: Chestnut Oak (*Quercus prinus*), 70, 31, 40, 100; Black Oak (*Q. velutina*), 27, 12, 9, 67; Red Oak (*Q. rubra*), 22, 10, 11, 83; Scarlet Oak (*Q. coccinea*), 12, 5, 11, 67; White Oak (*Q. alba*), 7, 3, 3, 33; hickory (*Carya* sp.), 28, 13, 12, 67, Red Maple (*Acer rubrum*), 18, 8, 4, 67; Dogwood (*Cornus florida*), 13, 6, 2, 33; White Pine (*Pinus strobus*), 8, 4, 3, 50. Trees by diameter size class: A (3-6 in.) 120, 53, 12, 16; B (6-9 in.) 73, 32, 22, 29; C (9-15 in.) 23, 10, 19, 24, D (15-21 in.) 5, 2, 9, 12; E (21-27 in.) 5, 2, 16, 20. Shrub stems/acre 14,700; ground cover 36%; canopy cover 85%; average canopy height 58 ft (range 31-68). **Edge:** Bounded on all sides by similar cover. **Topography:** Situated along the top of Sandy Ridge in a NW direction and is fairly level. **Elevation:** 2300 ft. **Weather:** Clear, dry, and hot for most of the census. **Coverage:** May 25-June 3; dawn-0650 or 1930-2100. Total man-hours 11. **Census:** Red-eyed Vireo, 4 (66, 27); Great Crested Flycatcher, 1; E. Wood Pewee, 1; Tufted Titmouse 1; Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Ovenbird, 1; Hooded Warbler, 1; Scarlet Tanager, 1; Whip-poor-will, 0.5; Black-capped Chickadee,

0.5; Indigo Bunting, 0.5; Ruffed Grouse, +; Turkey, +; Pileated Woodpecker, +; Corn Crow, +; White-breasted Nuthatch, +; Rufous-sided Towhee, +. **Total:** 19 species; 14.5 territorial males (239/km<sup>2</sup>, 97/100 acres). **Visitors:** Worm-eating Warbler, Pine Warbler, Am. Goldfinch. **Remarks:** An overall decrease was noted in the number of territorial males as compared with the 1969 census – 23.5 to 14.5. This decrease may be a result of the unusually hot dry spring. Species showing the greatest decrease were Pine Warblers and Ovenbirds; Ovenbirds from 4.5 territorial males to 1, and Pine Warblers from 4 to 1 visitor. Special thanks to Glen Phillips and Mike and Kathleen Finnegan for assisting with the vegetative survey. — *CAROLYN C. RUDDLE, Franklin, W. Va. 26807*

**13. OAK-HICKORY-LOCUST FOREST.** — **Location:** West Virginia; Hardy Co., Lost River State Park; 38°52'51"N, 78°55'59"W, Lost River State Park Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Hardwood forest cut prior to 1930. The dominant canopy trees are Red Oak (*Quercus rubra*) and Chestnut Oak (*Q. montana*). Most prominent in the understory are Striped Maple (*Acer pensylvanicum*) and Flowering Dogwood (*Cornus florida*). The ground cover is primarily Black Cohosh (*Cimicifuga racemosa*) and Thoroughwort (*Eupatorium* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on 6 circular samples, 235/acre; total basal area 110.4 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Red Oak, 36, 15, 37, 83; Chestnut Oak, 46, 20, 19, 100; Black Oak (*Q. velutina*), 21, 9, 11, 50; hickory (*Carya* sp.), 60, 25, 16, 83; Black Locust (*Robinia pseudo-acacia*), 28, 12, 9, 83. Trees by diameter size class A (3-6 in.) 106, 45, 11, 9; B (6-9 in.) 56, 24, 16, 15; C (9-15 in.) 46, 20, 41, 36; D (15-21 in.) 17, 7, 30, 26; E (21-27 in.) 5, 2, 15, 13. Shrub stems/acre 2608; ground cover 11%; canopy cover 87%; average canopy height 78 ft (range 62-105). **Edge:** Forest continues in all directions. **Topography:** The center line is a Park Trail which follows the contour on the E slope of Shenandoah Mountain. **Elevation:** 2400 ft. **Weather:** Cool and dry; scattered frost one night. **Coverage:** June 4-8; dawn-0745 or 1900-2100. Total man-hours: 10. **Census:** Cerulean Warbler, 4 (66, 27); Am. Redstart, 3.5 (58, 23); Acadian Flycatcher, 2.5; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Wood Thrush, 2; Blue-gray Gnatcatcher, 2; Scarlet Tanager, 2; White-breasted Nuthatch, 1.5; Red-eyed Vireo, 1; Worm-eating Warbler, 1; Downy Woodpecker, 0.5; Rose-breasted Grosbeak, +; Red-bellied Woodpecker, +; Pileated Woodpecker, +; Brown-headed Cowbird, +. **Total:** 16 species; 24 territorial males (395/km<sup>2</sup>, 160/100 acres). **Remarks:** Two nests were located: Wood Thrush and Downy Woodpecker. — *ANNE PYLE, ANNE LLEWELLYN, GREG EDDY, LAURA KOCH, JUANITA DELANCEY, MAXINE THACKER, ARDETH SMITH, LEW SMITH, IRIS MOELLER, MAXINE KIFF, ESTHER REICHLER, BILL SMITH (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.*

**14. OAK-HICKORY-RED MAPLE FOREST.** — **Location:** West Virginia; Monroe Co., in Hanging Rock Nature Study Area, 2.7 mi NNW from Waiteville; starts at 37°30'30"N, 80°26'21"W, Gap Mills Quadrangle,

USGS, and extends SW curving to W. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, length measured, width estimated). **Description of Plot:** A hardwood forest undisturbed since 1925. The dominant canopy trees are oaks. Most prominent in the understory are *Vaccinium* sp., *Azalea* sp., Mountain Laurel (*Kalmia latifolia*), and *Sassafras albidum*. The ground cover, in addition to the blueberries, is primarily Loosestrife (*Lysimachia lanceolata*), ferns, mostly Bracken (*Pteridium aquilinum*), and Wild Lily-of-the-Valley (*Convallaria montana*). A quantitative vegetation survey of six 0.1 acre samples gives: Trees 3 in. dbh and over 348/acre; total basal area 56.1 ft<sup>2</sup>/acre. Species comprising 95% of the total number of trees: Chestnut Oak (*Quercus prinus*), 88, 25, 26, 100; Black Oak (*Q. velutina*), 50, 14, 18, 100; Red Oak (*Q. rubra*), 43, 12, 14, 100; White Oak (*Q. alba*), 45, 13, 13, 83; Red Maple (*Acer rubrum*), 50, 14, 9, 83; Shagbark Hickory (*Carya ovata*), 17, 5, 5, 83; Mockernut Hickory (*C. tomentosa*), 15, 4, 4, 100; dead trees, 28, 8, 6, 83. Trees by diameter size class: A (3-6 in.) 282, 78, 28.2, 50; B (6-9 in.) 70, 19, 21, 38; C (9-15 in.) 5, 2, 4, 7; D (15-21 in.) 2, 1, 3, 5. Shrub stems/acre 11,300; ground cover 30%; canopy cover 60% (estimated; a late freeze killed all the oak leaves and affected most of the other plants, making our actual canopy cover count of 20% invalid); average canopy height 39 ft (range 33-42). **Edge:** Forest continues on all sides. **Topography:** A hillside plot on the S side but near the top of Peters Mountain. The centerline falls from 3520 to 3400 ft midway then rises to 3460 at the end. The lateral fall across the plot is 80-120 ft down to the left. **Weather:** Hot and dry. **Coverage:** May 18-22, dawn-0820 or 1950-2100. Total man-hours: 22. **Census:** Ovenbird, 2.5; E. Wood Pewee, 2; Indigo Bunting, 2; Black-and-white Warbler, 1.5; Scarlet Tanager, 1.5; Tufted Titmouse, 1; Red-eyed Vireo, 1; Rufous-sided Towhee, 1; Great Crested Flycatcher, 0.5; Wood Thrush, 0.5; Rose-breasted Grosbeak, 0.5; Ruffed Grouse, +; Whip-poor-will, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Blue Jay, +; Carolina Chickadee, +; White-breasted Nuthatch, +; Brown-headed Cowbird, +. **Total:** 19 species; 14 territorial males (231/km<sup>2</sup>, 93/100 acres). **Visitors:** Yellow-billed Cuckoo, Blue-gray Gnatcatcher, Yellow-throated Vireo, Solitary Vireo and Am Goldfinch. **Remarks:** The trees had been defoliated by a late frost at this altitude. The small number of birds reflects the lack of diversity in the habitat, lack of moisture and possibly the effects of the late frost. The only nest found was that of the Ruffed Grouse — *DOROTHY BROEMSEN, ANNE and GREG EDDY, MARY FORD, GEORGE HURLEY, GEORGE KOCH, NEVADA LAITSCH, WILLIAM SMITH and GLEN PHILLIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.*

**15. OAK-MAPLE-BIRCH FOREST.** — **Location:** West Virginia; Hardy Co., 2.5 mi WSW from Mathias, 38°51'50"N, 78°54'29"W, Bergton Quadrangle, USGS, extends ESE. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, length measured, width estimated). **Description of Plot:** A hardwood forest last cut over about 1940. The dominant canopy trees are Chestnut Oak (*Quercus prinus*) and Red Maple (*Acer rubrum*). Prominent in the understory are Witch Hazel (*Hamamelis virginiana*), blueberry (*Vaccinium* sp.), and seedlings of the canopy species. The sparse ground cover is quite varied. Both Pipsissewas are present (*Chimaphila*

*umbellata* and *maculata*), and some Teaberry (*Gaultheria procumbens*). Many of the blueberries are low enough to be considered ground cover. There are a number of Greenbriers (*Smilax rotundifolia*) and a few ferns and grasses. A quantitative vegetation survey of six 0.1 acre samples gives: Trees 3 inches dbh and over, 237/acre; total basal area, 92.1 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: Chestnut Oak, 52, 22, 26, 100; Red Oak (*Q. rubra*), 5, 2, 7, 33; White Oak (*Q. alba*), 5, 2, 5, 50; Red Maple, 50, 21, 21, 100; Black Birch (*Betula lenta*), 40, 17, 14, 67; Hickory (*Carya sp.*), 7, 3, 6, 50; Tulip-tree (*Liriodendron tulipifera*), 23, 10, 6, 50; Basswood (*Tilia americana*), 7, 3, 3, 17; Black Gum (*Nyssa sylvatica*), 10, 4, 5, 67; dead trees, 15, 6, 5, 83. Trees by diameter size class: A (3-6 in.) 132, 56, 13.2, 14; B (6-9 in.) 43, 18, 12.9, 14; C (9-15 in.) 45, 19, 36, 39; D (15-21 in.) 17, 7, 30, 33. Shrub stems/acre 4330; ground cover 22%; canopy cover 85%; average canopy height 74 ft (range 68-83). **Edge:** Forest continues on all sides. **Topography:** The centerline follows an intermittent stream, falling from elevation 1960 to 1840 ft. The sides average about 40 ft higher than the centerline. **Weather:** Cool, occasional rain, some wind. The first break in an extremely dry and hot spring. **Coverage:** June 5-8; 10 trips, between dawn-0730 and 2 in the evening. Total party-hours: 8. **Census:** Acadian Flycatcher, 3 (49, 20); Red-eyed Vireo, 3; E. Wood Pewee, 2.5; Tufted Titmouse, 1; Blue-gray Gnatcatcher, 1; Louisiana Waterthrush, 1; Red-bellied Woodpecker, 0.5; Broad-winged Hawk, +; Screech Owl, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Com. Crow, +; Black-capped Chickadee, +; White-breasted Nuthatch, +; Brown-headed Cowbird, +. **Total:** 15 species; 12 territorial males (198/km<sup>2</sup>, 80/100 acres). **Visitors:** Yellow-billed Cuckoo, Black-billed Cuckoo, Wood Thrush, Am. Goldfinch, Rufous-sided Towhee. **Remarks:** A nest of the Acadian Flycatcher was found. The usual low population in a normally dry area may have been further reduced by the extremely dry spring. The rain during the census week was the first in two months. Special thanks to Glen Phillips, George Koch, Bill Smith and Greg Eddy for their work on plot layout and vegetation survey and for advice on evaluating the census. — **VIRGINIA JOHNSON (compiler), JEAN ANDERSON, RALPH BELL, JUANITA DELANCEY, ANNE EDDY, KATHLEEN FINNEGAR, GEORGE A. HALL, LORRAINE HARPER, EUGENE HUTTON, NEVADA LAITSCH, CHARLOTTE LANHAM, LIBBY MCINTYRE, IRIS MOELLER, ANN PYLE, CAROLYN RUDDLE, ZETTIE STEWART, JOSEPHINE WOOD, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.**

**16. RED OAK-MAPLE-BIRCH FOREST.** — **Location:** West Virginia; Monroe Co., in Hanging Rock Nature Study Area, 2.5 mi NNW from Waiteville; starts at 37°30'21"N, 80°26'49"W, Gap Mills Quadrangle, USGS, extends W along the Allegheny Trail. **Continuity:** New Size: 6.07 ha = 15 acres (rectangular, 110 x 660 yards, length measured, width estimated). **Description of Plot:** A hardwood forest undisturbed since before 1930. The dominant canopy tree is Red Oak (*Quercus rubra*). The understory is mostly Witch Hazel (*Hamamelis virginiana*), *Azalea* sp., *Hydrangea arborescens*, and seedlings of the canopy species. Prominent in the quite varied herb cover are Plume-lily (*Smilacina racemosa*), Black Cohosh (*Cimicifuga racemosa*), pink Trillium (*Trillium*

*grandiflorum*), Virginia Waterleaf (*Hydrophyllum virginianum*), several ferns and a few grasses. A quantitative vegetation survey of six 0.1 acre samples gives: Trees 3 in dbh and over 262/acre; total basal area 128 ft<sup>2</sup>/acre. Species comprising 94% of the total number of trees: Red Oak, 83, 32, 64, 100; Sugar Maple (*Acer saccharum*), 38, 15, 5, 67; Striped Maple (*A. pensylvanicum*), 15, 6, 1, 83; Red Maple (*A. rubrum*), 13, 5, 1, 50; Black Birch (*Betula lenta*), 42, 16, 6, 100; Hickory (*Carya sp.*), 18, 7, 4, 67, dead trees, 33, 13, 9, 100. Trees by diameter size class A (3-6 in.) 153, 59, 15.3, 12; B (6-9 in.) 35, 13, 11.3, 9, C (9-15 in.) 47, 18, 37.4, 29; D (15-21 in.) 17, 6, 30, 23, E (21-27 in.) 8, 3, 25.9, 20; F (27-33 in.) 2, 1, 8.2, 6. Shrub stems/acre 4510; ground cover 56%; canopy cover 61% (the canopy cover would have been about 90% had not a recent freeze killed most of the leaves); canopy height 52 ft (range 30-65 ft). **Edge:** Forest continues on all sides. **Topography:** The centerline follows a trail on the N side of the crest of Peters Mountain from elevation 3580-3750 ft. The crest is in the plot and varies from 5 ft above the path at the start to 60 ft above at the end opposite the Hanging Rock Lookout Tower. The crest is a series of cliffs and rock outcrops. The S edge is over the crest and from 10 to 30 ft lower. The N edge is from 50 to 90 ft lower than the centerline. **Weather:** One morning cool and foggy; the rest clear, hot and dry. **Coverage:** May 19-22; 13 trips, 0545-0800, and 2 trips in late evening. Total party-hours: 8. **Census:** Chestnut-sided Warbler, 3 (49, 20); Rufous-sided Towhee, 3; Ovenbird, 2; Indigo Bunting, 2; Red-eyed Vireo, 1.5; Black-and-white Warbler, 1.5; Dark-eyed Junco, 1.5; Black-throated Blue Warbler, 1; Scarlet Tanager, 1; Solitary Vireo, 0.5; Hooded Warbler, 0.5; Rose-breasted Grosbeak, 0.5; Downy Woodpecker, +; Great Crested Flycatcher, +; E. Wood Pewee, +; Wood Thrush, +; Brown-headed Cowbird, +. **Total:** 17 species; 18 territorial males (297/km<sup>2</sup>, 120/100 acres). **Visitors:** Chimney Swift, Pileated Woodpecker, Blue Jay, Com. Crow, Com. Raven, White-breasted Nuthatch, Cedar Waxwing. **Remarks:** The juncos ceased singing after the first day but were seen carrying food on later trips. — **WILLIAM SMITH (compiler), KATHLEEN and GARY BERT, DOROTHY BROEMSON, ANNE and GREG EDDY, MARY FORD, GEORGE HURLEY, GEORGE KOCH, NEVADA LAITSCH, GLEN PHILLIPS, CAROLYN RUDDLE, Brooks Bird Club, 707 Warwood Ave., Wheeling, W Va 26003.**

## 17. SECOND-GROWTH OAK-MAPLE FOREST.

— **Location:** West Virginia; Hardy Co., in Dove Hollow beginning 3.6 mi from intersection with main Park road, Lost River State park; 38°56'00"N, 78°53'51"W, Lost River Park Quadrangle, USGS. **Continuity:** New Size: 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are White (*Quercus alba*) and Red (*Q. rubra*) Oaks and Red (*Acer rubrum*) and Sugar (*A. saccharum*) Maples. Most prominent in the understory are: Flowering Dogwood (*Cornus florida*) and Witch Hazel (*Hamamelis virginiana*) and saplings of the canopy trees. The sparse ground cover is composed of Golden Ragwort (*Senecio aureus*), White Snakeroot (*Eupatorium urticaefolium*), some scattered tufts of grass, and ferns. The results of a quantitative vegetation survey based on six 0.1 acre samples are: Trees 3 in. in diameter and over, 430/acre, total basal area, 131.4 ft<sup>2</sup>/acre. Species comprising 90%

of the total trees White Oak, 140, 32, 23, 100, Red Oak, 111, 26, 28, 100; Maples (Red and Sugar), 66, 15, 14, 100, Hickory (*Carya* sp.), 20, 4, 4, 83; Basswood (*Tilia americana*), 10, 2, 3, 17; Black Gum (*Nyssa sylvatica*), 7, 2, 4, 50; Black Locust (*Robinia pseudo-acacia*), 8, 2, 1, 67, dead trees, 28, 7, 4, 100. Trees by diameter size class (figures = number of trees/acre, relative density, basal area in ft<sup>2</sup>/acre, and relative dominance: A (3-6 in.) 298, 69, 30, 23; B (6-9 in.) 85, 20, 25.5, 19; C (9-15 in.) 17, 4, 13, 10; D (15-21 in.) 23, 5, 42, 32; E (21-27 in.) 7, 2, 20.7, 16 Shrub stems/acre 1560; ground cover 4%; canopy cover 86%; average canopy height 64 ft (range 39-84). **Edge:** Similar forest in all directions. **Topography:** A typical hollow with small stream extending NE by SW at an average elevation of 1800 ft. **Weather:** Warm and dry except a change to rain and cool during latter part of period. **Coverage:** June 4-8; dawn-0740, with two mid-morning trips and two evening trips. Total party-hours: 12. **Census:** Acadian Flycatcher, 4 (66, 27); Blue-gray Gnatcatcher, 3 (49, 20); Red-eyed Vireo, 2.5; Tufted Titmouse, 2; Louisiana Waterthrush, 2; Wood Thrush, 1; Ovenbird, 1; Scarlet Tanager, 1; Worm-eating Warbler, 0.5, Cerulean Warbler, 0.5; Am. Redstart, 0.5; Yellow-billed Cuckoo, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; E. Wood Pewee, +. **Total:** 15 species, 18 territorial males (297/km<sup>2</sup>, 120/100 acres). **Visitors:** Downy Woodpecker, Blue Jay, Com. Crow, Brown-headed Cowbird, Am. Goldfinch. **Remarks:** The centerline of the plot is a hard-surface road which follows a small stream, with closed canopy in a deciduous second-growth forest in Dove Hollow. In one small area the hillside had been excavated for road fill. Blue-gray Gnatcatchers and Tufted Titmice were feeding young out of the nest. Special recognition to George Koch and Glen Phillips for assistance with the vegetation survey. — *E R and ELIZABETH DE G. CHANDLER (compilers), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003*

**18. DECIDUOUS FOREST WITH POND AND BROOK.** — **Location:** New Jersey; Bergen Co.; Mahwah, Campgaw Mountain Reservation. **Continuity:** Established 1964; 14 consecutive years. **Size:** Approximately 16.2 ha = 40 acres. **Description of Plot:** See AFN 19 623-624 (1965). **Coverage:** May 24, 26, 31; June 2, 9, 14, 16, 21; 0530-0645. Total party-hours: 10. **Census:** Tufted Titmouse, 3 (19, 8); Starling, 3; Ovenbird, 3; Canada Goose, 2; Com. Flicker, 2; Downy Woodpecker, 2, Tree Swallow, 2; Gray Catbird, 2; Wood Thrush, 2; Veery, 2; Red-eyed Vireo, 2; Blue-winged Warbler, 2; Com. Yellowthroat, 2; Song Sparrow, 2; Yellow-billed Cuckoo, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Am. Robin, 1; Yellow-throated Vireo, 1; Louisiana Waterthrush, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Scarlet Tanager, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1. **Total:** 30 species; 47 territorial males (290/km<sup>2</sup>, 118/100 acres). — *P. BOLTON, T. DYE, L. GAITSKILL, G. LITTELL, J. MOFFAT, K. SJOLANDER, J. WHITE, J. & J. WORRALL and J. BROTHERTON (compiler), Fyke Nature Assoc., 249 E. Crescent Avenue, Mahwah, N.J. 07430.*

**19. HICKORY-OAK-ASH FLOODPLAIN FOREST.** — **Location:** Maryland; Howard Co., Middle Patuxent River, due W of Hobbits Glen Golf Course, Columbia;

39°13'10"N, 76°54'45"W, Clarksville Quadrangle, USGS **Continuity:** Established 1971; 6 intermittent years. **Size:** 18.4 ha = 45.5 acres. **Description of Plot:** The dominant canopy trees are Pin Oak (*Quercus palustris*), Red Ash (*Fraxinus pennsylvanica*), Am. Elm (*Ulmus americana*), and Red Maple (*Acer rubrum*). Most prominent in the understory are Flowering Dogwood (*Cornus florida*), Am. Hornbeam (*Carpinus caroliniana*) and Spicebush (*Lindera benzoin*). The ground cover is predominantly Japanese Honeysuckle (*Lonicera japonica*), Wood-nettle (*Laportea canadensis*), and Poison Ivy (*Rhus radicans*), however, the following species also are common: Virginia Creeper (*Parthenocissus quinquefolia*), Jewelweed (*Impatiens* sp.), Trout-lily (*Erythronium americanum*), Mayapple (*Podophyllum peltatum*), False Spikenard (*Smilacina racemosa*), Christmas Fern (*Polystichum acrostichoides*), New York Fern (*Dryopteris noveboracensis*) and Royal Fern (*Osmunda regalis*). A quantitative vegetation survey following the method prescribed by James and Shugart (AFN 24:727-736, 1970) gave the following results: Trees 3-in. dbh and over, based on 7 circular 0.1-acre samples, 157/acre; total basal area 52.9 sq ft/acre. Species comprising 93% of the total number of trees: Pin Oak, 30, 19, 33, 71; Red Ash, 14, 9, 18, 43, Am. Elm, 20, 13, 5, 57; dead trees, 16, 10, 9, 86, Red Maple, 7, 4, 5, 14; Black Walnut (*Juglans nigra*), 6, 4, 5, 57; Am. Hornbeam, 17, 11, 4, 71; Sycamore (*Platanus occidentalis*), 4, 3, 5, 29; Bitternut Hickory (*Carya cordiformis*), 4, 3, 4, 29; Black Haw (*Viburnum prunifolium*), 7, 4, 1, 29; Black Cherry (*Prunus serotina*), 4, 3, 3, 43, grape (*Vitis* sp.), 6, 4, 1, 29; Black Willow (*Salix nigra*), 4, 3, 2, 29; hawthorn (*Crataegus* sp.), 4, 2, 2, 29; Boxelder (*Acer negundo*), 3, 2, 1, 14. Trees by diameter size class A (3-6 in.) 64, 41, 4.4, 8; B (6-9 in.) 30, 19, 6.3, 12; C (9-15 in.) 53, 34, 29.6, 56; D (15-21 in.) 10, 6, 12.6, 24. Shrub stems/acre, 15,500; ground cover 55%; canopy cover 65%; average canopy height 58 ft (range 55-60). See also AB 25:963-964. The soils vary in drainage and are highly acidic. Comus silt loam is the predominant soil type and is well drained. However, there is a pocket of Hatsboro silt loam at the NE edge and one of mixed alluvial soils in the SW corner, both poorly drained. **Edge:** Bordered on the N and SE by a continuation of the floodplain forest, on the E by a golf course, on the W by an old field and recently timbered deciduous forest, and on the S by the Tulip-tree-Maple-Oak Forest plot (census 24). A buffer strip of at least 50 ft separates the study plot from the old field; at some points along the eastern boundary the golf course approaches to within 50 ft but this is not felt to have any measurable influence on the bird population of the study plot. **Topography:** Essentially flat, but sloping about 5 ft per 1000 ft toward the SSE. The floodplain is bisected by the Middle Patuxent River. **Elevation:** 297-310 ft. The river flows through a deep channel; elevation at low water is 292-295 ft. **Coverage:** May 31; June 2, 11, 17, 22, 25, 30; July 31. Surveys started at about sunrise and lasted an average of 3 hours and 25 minutes. Total hours, 27. **Census:** Gray Catbird, 35 (190, 77); Acadian Flycatcher, 17 (92, 37); Wood Thrush, 16 (87, 35); Red-eyed Vireo, 13.5 (73, 30); Am. Redstart, 13 (71, 29); Cardinal, 12.5 (68, 27); Red-bellied Woodpecker, 7.5 (41, 16); Tufted Titmouse, 7 (38, 15); White-eyed Vireo, 7; E. Wood Pewee, 6 (33, 13); Blue-gray Gnatcatcher, 6; Downy Woodpecker, 5.5 (30, 12); Carolina Chickadee, 5 (27, 11); Veery, 5; Com. Yellowthroat, 5; N. Parula, 3.5 (19, 8); Brown-headed Cowbird, 3 (16, 7); Ruby-throated

Hummingbird, 2.5; Com. Flicker, 2.5; Scarlet Tanager, 2.5; Mourning Dove, 2; Kentucky Warbler, 2; Rufous-sided Towhee, 2; Hairy Woodpecker, 1.5; Yellow-throated Vireo, 1.5; Louisiana Waterthrush, 1.5; Am. Goldfinch, 1.5; Yellow-billed Cuckoo, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Cerulean Warbler, 1; Hooded Warbler, 1; N. (Baltimore) Oriole, 1; Pileated Woodpecker, 0.5; Com. Crow, 0.5; Indigo Bunting, 0.5; Mallard, +; Red-shouldered Hawk, +; Barred Owl, +. **Total:** 42 species; 197.5 territorial males ( $1073/\text{km}^2$ , 434/100 acres). **Remarks:** The Carolina Wren, which in each previous year had been represented by 1.5 to 3.5 pairs, did not breed in the plot this year. A wandering individual first appeared on June 30. The only other species recorded in unusual numbers this year was the Wood Thrush, which reached a new high of 16 territories. The Louisiana Waterthrush has gradually declined from 3 territories in 1971 to 1.5 this year. The quantitative survey of the vegetation was repeated this year, using a new sample of random 0.1-acre circles. The results show drastic changes from the original description, which included some misidentifications; there also is a strong indication that the number of 0.1-acre circles sampled was far too small to give an adequate measure of the tree composition of this habitat. Further work is needed to determine adequate sample sizes for quantitative habitat descriptions in various habitats. — *CHANDLER S. ROBBINS, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.*

**20. MATURE DECIDUOUS FLOODPLAIN FOREST.** — **Location:** Maryland; Montgomery Co., Cabin John Island, Glen Echo; 2.5 mi NW of the District of Columbia, between the C. and O. Canal and the Potomac River, just S of Cabin John Creek; Falls Church Quadrangle, USGS. **Continuity:** Established 1947; 25 intermittent years. **Size:** 7.6 ha = 18.75 acres. **Description of Plot:** See AFN 1:212-213 (1947). **Coverage:** March 27; April 2-3, 16, 23-24; May 1, 8, 21-22, 29; June 11, 26; July 3; 15 trips, 0415-1030 EST. Total man-hours: 33.75. **Weather:** In general, clear and calm on walks. Average temperature, 61°F. **Census:** Starling, 18 (237, 96); Red-eyed Vireo, 8 (105, 43); Acadian Flycatcher, 6 (79, 32); Blue-gray Gnatcatcher, 5 (66, 27); Cardinal, 5; Downy Woodpecker, 3 (40, 16); Carolina Chickadee, 3; Tufted Titmouse, 3; N. Parula, 3; Am. Redstart, 3; Red-bellied Woodpecker, 2; Song Sparrow, 1.5; Wood Duck, 1; Barred Owl, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Com. Crow, 1; Brown Creeper, 1; Carolina Wren, 1; Yellow-throated Warbler, 1; Brown-headed Cowbird (female), 1. **Total:** 22 species; 70.5 territorial males or females ( $929/\text{km}^2$ , 376/100 acres). **Remarks:** Nests found: Starling, 18; Pileated Woodpecker, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; Brown Creeper, 1; Acadian Flycatcher, 1. The total of 70.5 territories is not much higher than the 66 total for 1976 and continues well below the 91.5 for 1975. Some of the decrease last year was accounted for by a drop in Starlings and N. Parulas. These species increased somewhat this year. There was also a new nester, the Yellow-throated Warbler. However, there was a considerable loss of Carolina Wrens, because of the hard winter of 1977. The loss was apparent in the winter census of this area. In the breeding census these birds dropped from a high of 7 in 1976 to 1 in 1977, nearly as

low as in 1961, when severe winter weather reduced their number to zero. A continuing population trend in this census and others in the Washington, D.C. area is the steady decrease in summer residents. Those continuing this trend in 1977 were the Great Crested Flycatcher, Acadian Flycatcher, E. Wood Pewee, Red-eyed Vireo, N. Parula, and Am. Redstart. This year the Prothonotary Warbler was absent for the first time. Others no longer in residence are the Wood Thrush, Veery and Kentucky Warbler. — *JOAN H. CRISWELL (compiler), W. H. CRAMER, J. R. GAUTHEY, Audubon Naturalist Society, 8940 Jones Mill Road, Washington, D.C. 20015*

## 21. MATURE TULIP-TREE-OAK FOREST.

— **Location:** Maryland; Prince Georges Co., 6 mi N of Upper Marlboro;  $38^\circ 53' 45''\text{N}$ ,  $76^\circ 45' 46''\text{W}$ , Lanham Quadrangle, USGS. **Continuity:** Established 1947, 4 intermittent years. See AFN 1:211-212 (1947) and AB 31:17-23 (1977). **Size:** 14.6 ha = 36 acres. **Description of Plot:** See AB 31:91 (1977). **Coverage:** April 14, 30, May 26, 30; June 7-8, 11. **Total:** 23 man-hours. **Census:** Red-eyed Vireo, 30 (206, 83); Wood Thrush, 17.5 (120, 49); Red-bellied Woodpecker, 12.5 (86, 35); E. Wood Pewee, 11.5 (79, 32); Downy Woodpecker, 8 (55, 22); Cardinal, 7.5 (51, 21); Acadian Flycatcher, 6 (41, 17); Tufted Titmouse, 4 (27, 11); Kentucky Warbler, 4; Scarlet Tanager, 4; Ovenbird, 3 (21, 8); Blue Jay, 2.5; Carolina Chickadee, 2; White-breasted Nuthatch, 2; Hooded Warbler, 2; Com. Flicker, 1; Hairy Woodpecker, 1; Ruby-throated Hummingbird, +; Com. Crow, +; Blue-gray Gnatcatcher, +; Starling, +; Brown-headed Cowbird, +. **Total:** 22 species; 118.5 territorial males ( $813/\text{km}^2$ , 329/100 acres). **Remarks:** Previous censuses recorded edge species as well as forest interior species. This year the edge population included Indigo Bunting, 5; Com. Yellowthroat, 3; Mourning Dove, 1; Gray Catbird, 1; Rufous-sided Towhee, 1; Am. Robin, +; Bobwhite, +. The minimal and maximal annual species turnover rates, from 1976 to 1977, were 8.2 and 9.8%. An "apparent" colonization by Blue-gray Gnatcatcher is the basis for the difference. Disappearance of Yellow-throated Vireo is in accord with regional and local trends. — *ROBERT WHITCOMB, NANCY E. MACCLINTOCK, LUCY MACCLINTOCK (compiler), 327 Scott Dr., Silver Spring, Md. 20904.*

## 22. MIXED HARDWOOD FOREST.

— **Location:** Maryland; Calvert Co., NW of Plum Point and 1 mi inland from Chesapeake Bay on Tobacco Road between Md. Routes 263 and 261. **Continuity:** Established 1960, 15 intermittent years. **Size:** 11.3 ha = 28 acres. **Description of Plot:** See AFN 13:333 (1959). **Weather:** 10 of the 12 full trips were on clear days. High temperatures, 73-94°F. Both the creek and bog became dry in early July. **Coverage:** April 21, 30; May 5, 7, 11, 16, 21, 28; June 3-4, 11, 18, 27-28; July 2, 4, 9, 15. **Total:** 12 full trips averaged 109 minutes. **Census:** Red-eyed Vireo, 22 (194, 79); Cardinal, 15 (132, 54); Wood Thrush, 14 (124, 50); Rufous-sided Towhee, 13 (115, 46); Acadian Flycatcher, 7 (62, 25); Yellow-throated Vireo, 5 (44, 18); Ovenbird, 5; Kentucky Warbler, 5; Com. Yellowthroat, 5; Hooded Warbler, 5; Scarlet Tanager, 5; Am. Woodcock, 4 (35, 14); Mourning Dove, 4; Red-bellied Woodpecker, 4; E. Wood Pewee, 4; Summer Tanager, 4; Great Crested Flycatcher, 3 (26, 11); Carolina Chickadee, 3; Tufted Titmouse, 3; N. Parula, 3; Louisiana Waterthrush, 3; Bobwhite, 2; Com. Flicker, 2; Hairy Woodpecker, 2; Blue-gray Gnatcatcher,

2, White-eyed Vireo, 2, Com. Grackle, 2, Indigo Bunting, 2, Am. Goldfinch, 2; Whip-poor-will, 1; Downy Woodpecker, 1; Blue Jay, 1; Pine Warbler, 1; Yellow-breasted Chat, 1; Brown-headed Cowbird, 1; Field Sparrow, 1, Green Heron, +; Red-shouldered Hawk, +; Am. Kestrel, +; Yellow-billed Cuckoo, +; Barred Owl, +; Ruby-throated Hummingbird, +; Pileated Woodpecker, +, Com. Crow, +; Fish Crow, +; Carolina Wren, +; Gray Catbird, +; Brown Thrasher, +; Am. Robin, +; E. Bluebird, +; Worm-eating Warbler, +; Am. Redstart, +; Blue Grosbeak, +; Chipping Sparrow, +. **Total:** 54 species; 159 territorial males (1403/km<sup>2</sup>, 568/100 acres). **Remarks:** The 36 species with complete territories on the plot were 2 less than last year, but equalled the 16-year average. The territorial males (159) dropped for the fifth consecutive year, were the lowest since 1962. The previous 16-year average was 232. The Red-eyed Vireo repeated as the most numerous species, but the territories were greatly reduced. The Cardinal increased slightly and returned to second. Following were the Wood Thrush, Rufous-sided Towhee and Acadian Flycatcher. These showed losses except the towhee which increased greatly. Other species showing increases were Mourning Dove, Great Crested Flycatcher, Yellow-throated Vireo, Hooded Warbler, Com. Yellowthroat, and Summer Tanager. Other species showing marked losses were Downy Woodpecker, Tufted Titmouse, Carolina Wren, and Ovenbird. The Carolina Wren (14 last year) suffered the greatest loss, and was considered not on a single territory this year. This was probably due to the severity of last winter. The marked changes recorded this year for the other species were due greatly to the logging of the mature trees during the past winter in 400 acres in which the plot is located, and the further cutting of certain remaining trees during the present census. This resulted in many clear and bare areas in this normally wooded habitat. However, by midyear the ground became densely covered with a rich assortment of weeds some of which became head high. The Whip-poor-will and Yellow-breasted Chat occurred for the first time since 1968 and 1966 respectively. There were no new species in the area this year. A total of 76 have occurred during the 17 studies. — JOHN H. FALES, 2809 Ridge Road, Neeld Estate, Huntingtown, Md. 20639.

**23. SELECTIVELY LOGGED MATURE TULIP-TREE-OAK FOREST.** — **Location:** Maryland; Prince Georges Co., 6.5 mi N of Upper Marlboro; 38°55'N, 76°45'30"W, Lanham Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AB 31:17-23 and 92-93 (1977). **Coverage:** April 20, 26-27; May 6, 21-22, 27-28; June 8; July 2. **Total:** 28 man-hours. **Census:** Red-eyed Vireo, 24 (169, 69); Wood Thrush, 18.5 (131, 53); Cardinal, 14.5 (102, 41); Hooded Warbler, 13 (92, 37); Red-bellied Woodpecker, 12 (85, 34); E. Wood Pewee, 7.5 (53, 21); Acadian Flycatcher, 7 (49, 20); Scarlet Tanager, 6.5 (46, 19); Downy Woodpecker, 6 (42, 17); Kentucky Warbler, 5.5 (39, 16); Tufted Titmouse, 4 (28, 11); Yellow-throated Vireo, 4; Brown-headed Cowbird, 4; White-breasted Nuthatch, 3.5 (25, 10); Rufous-sided Towhee, 3.5; Carolina Chickadee, 3 (21, 9); Indigo Bunting, 3; Ovenbird, 2.5; Am. Woodcock, 2; Com. Flicker, 2; Hairy Woodpecker, 2; White-eyed Vireo, 2; Blue Jay, 1.5; Red-tailed Hawk, 1; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Carolina Wren, 1; Gray Catbird, 1; Brown

Thrasher, 1; Starling, 1; Red-shouldered Hawk, +; Ruby-throated Hummingbird, +; Com. Crow, +; Blue-gray Gnatcatcher, +; Com. Yellowthroat, +. **Total:** 35 species; 158.5 territorial males (1119/km<sup>2</sup>, 453/100 acres). **Remarks:** This year we were especially careful to determine the number of Red-bellied Woodpecker territories. One visit was made to this plot and to the undisturbed plot (Census No. 21) using the tape playback technique. Also, special attention was given this species on all regular visits. The total number of pairs was higher in each plot than estimated in previous years. Territorial sizes ranged from 2 to about 3.5 acres in both plots. We therefore reviewed maps from past censuses of these plots, and wish to amend past estimates as follows: North tract: 1975: 12 pairs; 1976: 10 pairs; South tract 1947: 9 pairs; 1975: 9 pairs; 1976: 9 pairs. The unusually dense packing of this species in both plots may be owing to the large total area of trunk surface available for foraging in a rich, mature woodland. The estimate of 94% reduction in the Carolina Wren population in this and the undisturbed plot is in good agreement with count data taken Jan. 15 and Feb. 19 which estimated an 85% reduction in the population of a nearby forest system. — ROBERT F. WHITCOMB, LUCY MACCLINTOCK, NANCY E. MACCLINTOCK (compiler), 327 Scott Dr., Silver Spring, Md. 20904.

**24. UPLAND TULIP-TREE - MAPLE - OAK FOREST.** — **Location:** Maryland; Howard Co., Wedge of Middle Patuxent River Valley, SW of the Hobbits Glen Golf Course at Columbia; 39°12'55"N, 76°54'40"W, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; 7 consecutive years. **Size:** 11.98 ha = 29.6 acres. **Description of Plot:** A revised quantitative survey of the vegetation based on the method proposed by James and Shugart (AFN 24:727-736) is as follows: Trees, 3-in dbh and over, based on six 0.1-acre circular samples, 300/acre; total basal area 55.5 sq ft/acre. Species comprising 90% of the total number of trees [figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence]: Tulip-tree (*Liriodendron tulipifera*), 82, 27, 44, 100; dead trees, 42, 14, 8, 100; Red Oak (*Quercus rubra*), 27, 9, 1.3, 100; White Oak (*Q. alba*), 10, 3, 2, 33; Pignut Hickory (*Carya glabra*), 28, 10, 11, 100; Red Maple (*Acer rubrum*), 15, 5, 3, 50; Flowering Dogwood (*Cornus florida*), 58, 19, 6, 83; Scrub Pine (*Pinus virginiana*), 13, 4, 7, 67. Trees by diameter size class [figures after each class give number of trees/acre, relative density (%), basal area in sq ft/acre, relative dominance]: A (3-6 in.) 158, 53, 9.5, 17, B (6-9 in.) 77, 25, 13.8, 25; C (9-15 in.) 63, 21, 30.4, 55, D (15-21 in.) 2, 1, 1.8, 3. Shrubs stems/acre, 2940; ground cover 63%; canopy cover 67%; average canopy height 58 ft (range 55-60). (See also AB 25:971.) The soils are well drained and moderately to severely erodible. Nearly the whole area is covered with various Manor loams, and almost half of it is of the more highly erodible types. **Edge:** Bordered on the N by the Hickory-Oak-Ash Floodplain Forest plot (Census 19); on the E and most of the S by a continuation of the upland Tulip-tree-maple-oak forest; on the SW by a mature pine woods; and on the W by an old field. Edge effect was essentially eliminated by keeping the plot boundary 50 to 100 ft within the deciduous forest edge. **Topography:** A hilltop with a relief of less than 3 ft in one-half acre is centrally located 250 ft within the southern boundary. From the summit a grad-

ual slope to the NE falls 25 ft in a horizontal distance of 500 ft. Elsewhere the elevation drops sharply, especially along the E and NE where it drops 30-35 ft per 100 ft. Most of the plot slopes toward the N with an average fall of 140 ft per 1000 ft. **Elevation:** 310-412 ft. **Coverage:** May 26; June 1, 8, 16, 20, 23, 26; July 2. Surveys started within 10 minutes of sunrise and lasted 2½ hours. Total hours: 20. **Census:** Red-eyed Vireo, 19 (159, 64); Wood Thrush, 12 (100, 41); Cardinal, 9 (75, 30); Acadian Flycatcher, 6 (50, 20); Veery, 5 (42, 17); Scarlet Tanager, 5; Tufted Titmouse, 4 (33, 14); Hooded Warbler, 4; Rufous-sided Towhee, 4; Gray Catbird, 3.5 (29, 12); Red-bellied Woodpecker, 3 (25, 10); E. Wood Pewee, 3; Kentucky Warbler, 3; Downy Woodpecker, 2; Brown-headed Cowbird, 2; Ruby-throated Hummingbird, 1.5; Carolina Chickadee, 1.5; Blue-gray Gnatcatcher, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Hairy Woodpecker, 1; White-breasted Nuthatch, 1; White-eyed Vireo, 1; N. Parula, 1; Cerulean Warbler, 1; Ovenbird, 1; N. (Baltimore) Oriole, 1; Great Crested Flycatcher, 0.5; Yellow-throated Vireo, 0.5; Turkey Vulture, +; Black Vulture, +; Red-shouldered Hawk, +; Barred Owl, +; Com. Flicker, +; Pileated Woodpecker, +; Am. Goldfinch, +. **Total:** 36 species; 99 territorial males ( $826/\text{km}^2$ , 334/100 acres). **Visitors:** Blue Jay, Com. Crow, Purple Martin, Am. Redstart. **Remarks:** The greatest change from past years was the complete absence of Carolina Wrens, which had been wiped out by the severe winter weather. Despite this loss, the total breeding population reached a new high, 4 territorial males more than the previous high of 95 in 1971. The warbler population, however, has decreased every year except 1975. Nine species of warblers have held territories on the plot in one or more of the seven years, and the total warbler population has shown a highly significant decline ( $p < 0.01$ ) during this period. — *CHANDLER S. ROBBINS, 7902 Brooklyn Bridge Road, Laurel, Md. 20810.*

**25. MIXED UPLAND HABITAT.** — **Location:** District of Columbia, the central third of Glover-Archbold Park, a narrow, long stream valley park in the NW section. **Continuity:** Established 1959; 19 consecutive years (printed in this journal from 1960). **Size:** 14.2 ha = 35 acres. **Description of Plot:** See AFN 14:502-503 (1960). **Coverage:** April 2-3, 10, 15, 17, 19, 23, 30; May 15, 22, 28, June 12, 15, 26; July 10; August 7; 0615-2100. Total: 41 hours. **Weather:** Clear on 12 trips, rainy on 1, overcast or cloudy on the others, with temperatures 45-90°F, averaging 69°, wind calm or slight but once up to 10 mph. **Census:** Veery, 17 (120, 49); Cardinal, 16.5 (116, 47); Gray Catbird, 11 (78, 31); Rufous-sided Towhee, 11; Blue Jay, 10 (71, 29); Tufted Titmouse, 10; Carolina Chickadee, 8 (56, 23); Red-bellied Woodpecker, 7 (49, 20); Downy Woodpecker, 6 (42, 17); Carolina Wren, 6; Starling, 6; Com. Grackle, 5 (35, 14); Com. Flicker, 4 (28, 11); Red-eyed Vireo, 4; White-breasted Nuthatch, 3 (21, 9); Am. Robin, 3; Pileated Woodpecker, 2; Com. Crow, 2; Com. Yellowthroat, 2; E. Wood Pewee, 0.5; Screech Owl, +; White-eyed Vireo, +; Ovenbird, +; Am. Redstart, +; House Sparrow, +. **Total:** 25 species, 134 territorial males ( $946/\text{km}^2$ , 382/100 acres). **Visitors:** (found irregularly in the area, but within their breeding period and known to breed in the vicinity): Wood Duck, Red-shouldered Hawk, Rock Dove, Mourning Dove, Chimney Swift, Hairy Woodpecker, Acadian Flycatcher, Mockingbird, Brown Thrasher, Wood Thrush, Red-winged Blackbird, Brown-headed Cowbird. **Remarks:**

Nests found 1 Starling and 1 Blue Jay. This year's total species and territorial males were the lowest yet; but in keeping with the overall trends and possible effects of last winter, one of the coldest on record. There were 45 species in 1960, 206 males, while in 1972, 39 species, and the highest number of breeding pairs, 220.5. Last year, with 105-hour coverage, we had only 28 species, so the downward trend is not changed by more observation. Species have not been over 27 since 1973, but the low count of males is farther out of line. Second lowest was 150 in 1963, during the disturbance of sewer construction through the park. The cumulative total of species for the 19 years is 85. The Carolina Wren, whose population grows during periods of mild winter weather in this area, and drops sharply with cold, had its record number last summer, 14 breeding pairs. They have had a winter average of 4 in recent years, but dropped to 1 or 2 by the end of last winter's census. This summer's total of 6 is thus encouraging, since there had been only 3 in the early breeding censuses. Birds that increased notably were the Blue Jay, reaching a record 10 after a build-up from early 3 to 9 for the last 5 years; Com. Grackle, usually a visitor, with only 5 previous breeding records, 2 last year, 5 this; Am. Robin, now 3, occasionally 1 or 2 before; Com. Yellowthroat, with the first breeding record since 1972, had 7 in 1959, but had been low or absent since 1962, and the White-eyed Vireo, where even a + is encouraging for a bird with only 2 previous single territories (1959, 1961). Notable drops in number are seen for the Cardinal, 30 in 1972, 24 last year, now 16.5; Veery, going from 28 to 23 to 17 in the last 3 years; the Wood Thrush, up to 3 last year, now a visitor; Tufted Titmouse, going down 24-21-16-10 in the last 4 years; Acadian Flycatcher, 9 originally, dwindling since 1967 to visitor by 1974 but up to 2 last year, now visitor; no Great Crested Flycatcher, the first zero since 1973; Starling that has dropped from 25 in 1970 after building up from 3 in 1959, 17 in 1975, 13 in 1976, 6 this year. The Veery-Wood Thrush ratio continues as noted before, with the Wood Thrush in another setback. The steady drop in species and numbers of migratory birds nesting here and the corresponding increase in numbers of the all-year residents has had a small change probably because of the cold winter, but the long-term trend should not be affected. — *SHIRLEY A. BRIGGS (compiler), OLIVE HOLBROOK, NAPIER SHELTON, CHARLES N STEELE, 7605 Honeywell Lane, Bethesda, Md. 20014*

**26. COASTAL DISTURBED FLOODPLAIN.** — **Location:** Virginia; Gloucester Co., borders Gloucester C. H. Sanitary District on the E, Route 14 at lower end. **Continuity:** Established 1976. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 30:1053 (1976). **Coverage:** March 12, 24; April 17; May 1, 7, 15, 21, 28; June 8, 12, 18; July 3, 17, 30; 0600-0935, except one noon trip. **Total:** 19.2 hours. **Weather:** Clear, and usually calm. Temperatures 36-74°F (average 57°F). **Census:** Red-bellied Woodpecker, Acadian Flycatcher, Tufted Titmouse, Cardinal, 1.5; Blue Jay, Carolina Wren, Red-eyed Vireo, Louisiana Waterthrush, 1; Red-shouldered Hawk, Downy Woodpecker, E. Wood Pewee, Carolina Chickadee, Wood Thrush, White-eyed Vireo, Prothonotary Warbler, N. Parula, Pine Warbler, Ovenbird, Kentucky Warbler, Scarlet Tanager, 0.5; Yellow-billed Cuckoo, Great Crested Flycatcher, Blue-gray Gnatcatcher, Indigo Bunting, +. **Total:** 24 species; 16 territorial males

(198/km<sup>2</sup>, 80/100 acres). **Visitors:** Great Blue Heron, Green Heron, Wood Duck, Turkey Vulture, Am. Woodcock, Com. Flicker, Hairy Woodpecker, E. Phoebe, Am. Robin, Starling, Red-winged Blackbird, Com. Grackle, Rufous-sided Towhee, Am. Goldfinch, Song Sparrow. **Remarks:** Nests found: Red-shouldered Hawk, Red-bellied Woodpecker, White-eyed Vireo. — MARVIN L. WASS, Gloucester, Va., 23061.

**27. UPLAND OAK - HICKORY FOREST.** — **Location:** Virginia; Fairfax Co., Dranesville District Park, McLean, along Route 193 (old Georgetown Pike), approximately ¾ mile W of Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973; 5 consecutive years. **Size:** 11 ha = 27.2 acres. **Description of Plot:** See AB 25:636 (1971). **Weather:** Generally clear; no rain on any trip. The unusually high summer heat in this area did not begin until after most trips had been made. Temperature range, 42-81°F. **Coverage:** April 3, 8-10, 12-14, 16, 20, 25, 27-28, 30; May 1, 8, 10, 12-14, 16, 21; June 8, 18; July 16; 0610-1015 or 1210-2020. Total party-hours 68.6. **Census:** Red-eyed Vireo, 19.5 (177, 72); Carolina Chickadee, 5.5 (50, 20); Wood Thrush, 5.5; Red-bellied Woodpecker, 5 (45, 18); Tufted Titmouse, 4.5 (41, 17); Scarlet Tanager, 4.5; Great Crested Flycatcher, 4 (36, 15); Brown-headed Cowbird, 4; E. Wood Pewee, 3.5 (32, 13); Com. Grackle, 3.5; Blue Jay, 3 (27, 11); Cardinal, 3; Ovenbird, 2.5; White-breasted Nuthatch, 2; Downy Woodpecker, 1.5; Acadian Flycatcher, 1.5; Worm-eating Warbler, 1.5; Mourning Dove, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Louisiana Waterthrush, 0.5. **Total:** 22 species; 79 territorial males (718/km<sup>2</sup>, 290/100 acres). **Visitors:** Red-tailed Hawk, Red-shouldered Hawk, Broad-winged Hawk, Yellow-billed Cuckoo, Barred Owl, E. Phoebe, Com. Crow, Fish Crow, Brown Creeper, Carolina Wren, Gray Catbird, Am. Robin, Blue-gray Gnatcatcher, Yellow-throated Vireo, Black-and-white Warbler, Kentucky Warbler, Am. Goldfinch. **Remarks:** The Red-eyed Vireo population is again at a record high, well above last year's record of 14.5. The "visitor" status of the Carolina Wren, which last year reached a population of 7 territorial males, reflects the winter damage suffered by this species. — G. L. AXFORD, T. M. AXFORD, JON BAYLESS, DAN ELMER, G. H. ESPENSHADE, JESSICA M. GIUSTI, MARY MANION, S. W. TAYLOR, HOWARD M. WATSON, ROBERT J. WATSON (compiler), 2636 Marcy Road, Arlington, Va. 22207.

**28. 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:** New. **Size:** 13.0 ha = 32.1 acres (rectangular, surveyed and gridded). **Description of Plot:** Mostly (10 ha) mature forest with no disturbance this century and possibly no major disturbance in historical times; partially (3 ha) forest in advanced secondary succession at least 80 years old. This typical floodplain forest, bisected by a small seasonal creek, floods extensively in the spring. Slight variations in elevation correlate with major shifts in the frequencies of the species of oaks and the nature of the ground cover. The dominant canopy trees are Sweetgum, Cherrybark Oak, Willow Oak, Swamp Chestnut Oak, and two spe-

cies of Shagbark Hickory, an association of lowland trees more characteristic of the coastal plain than the piedmont of North Carolina. In damp areas, Japanese Honey-suckle (*Lonicera japonica*) forms a dense ground cover. The most abundant shrub is Shortstalk Arrowwood (*Viburnum rafinesquianum*). Quantitative analysis of thirteen 0.1-acre-circular samples gave the following results: Trees, 3 in. diameter and over, 430/acre, total basal area, 201 ft<sup>2</sup>/acre. Species comprising 99% of the total number of trees (figures after each species give number of trees/acre, relative density (%), relative dominance (%), frequency (%), in that sequence): Sweetgum (*Liquidambar styraciflua*), 133, 31, 27, 100; Am Elm (*Ulmus americana*), 50, 12, 6, 92; Cherrybark Oak (*Quercus falcata pagodifolia*), 44, 10, 13, 92; dead tree, 39, 9, 4, 92; Willow Oak (*Q. phellos*), 32, 8, 14, 85; Red Maple (*Acer rubrum*), 22, 5, 4, 62; N. Shagbark Hickory (*Carya ovata*), 21, 5, 11, 54; Swamp Chestnut Oak (*Q. michauxii*), 20, 5, 5, 62; Black Gum (*Nyssa sylvatica*), 17, 4, 2, 77; S. Shagbark Hickory (*C. caroliniana septentrionalis*), 10, 2, 4, 38; White Ash (*Fraxinus americana*), 9, 2, 1, 38; Loblolly Pine (*Pinus taeda*), 6, 1, 4, 31; E. Red Cedar (*Juniperus virginiana*), 6, 1, 1, 38; White Oak (*Q. alba*), 5, 1, 2, 38; Persimmon (*Diospyros virginiana*), 3, 1, 1, 23; Flowering Dogwood (*Cornus florida*), 2, 0.5, 0.1, 15; Ironwood (*Carpinus caroliniana*), 2, 0.5, 0.1, 8; Mockernut Hickory (*C. tomentosa*), 2, 0.4, 1, 8; Red Mulberry (*Morus rubra*), 2, 0.4, 0.2, 8. Trees by diameter size class [figures after each class give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance (%)]: A (3-6 in.), 209, 49, 21, 10, B (6-9 in.), 93, 22, 28, 14; C (9-15 in.), 89, 21, 72, 36; D (15-21 in.), 33, 8, 61, 30; E (21-27 in.), 4, 1, 12, 6; H (40+ in.), 1, 0.2, 8, 4. Shrub stems/acre, 55,700; ground cover, 52%; canopy cover, 77%; average canopy height, 75 ft (range 60-85 ft). **Edge:** Similar forest extends approximately 50-100 m on all sides. On three sides, at distances of about 200 m lie large tracts of similar forest. **Topography:** Nearly flat; within the floodplain of Morgan Creek. **Elevation:** 235-245 ft. **Coverage:** April 9-June 16; 10 visits at approximately weekly intervals between dawn and 1030 hours. Total party-hours: 23. **Census** Red-eyed Vireo, 17 (131, 53); Acadian Flycatcher, 12.5 (96, 39); Carolina Wren, 12 (92, 37); Tufted Titmouse, 9 (69, 28); Blue-gray Gnatcatcher, 8 (62, 25); Cardinal, 7 (54, 22); Carolina Chickadee, 6 (46, 19); Wood Thrush, 5 (38, 16); Yellow-throated Vireo, 4.5 (35, 14); Hooded Warbler, 4.5; Kentucky Warbler, 4 (31, 12); Red-bellied Woodpecker, 3 (23, 9); Summer Tanager, 3; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Black-and-white Warbler, 1; N. Parula, 1; Yellow-throated Warbler, 1; Ovenbird, 1; Red-tailed Hawk, +; Barred Owl, +; Blue Jay, +. **Total:** 24 species; 103.5 territorial males (797/km<sup>2</sup>, 322/100 acres). **Visitors:** Bobwhite, Am Woodcock, Com. Flicker, Hairy Woodpecker, Pileated Woodpecker, White-breasted Nuthatch, Com. Crow, Com. Grackle. **Remarks:** Red-tailed Hawk nested successfully. — M. CROTTEAU, C. DAL MOLIN, R FOX, S. GIDUZ, S. HALL (co-compiler), K. HOPKINS, D. KENNEDY, H. MUELLER, D. NEWMAN, S O'BRYAN, D. RICHARDS, P. SPIEGEL, H. WILEY (co-compiler), H. WILSON, Dept. of Zoology, Univ. of North Carolina, Chapel Hill, N.C. 27514.



**29. MIXED DECIDUOUS FOREST.** — **Location:** North Carolina; Orange Co., partly within the research area of the N.C. Botanical Garden, 2.5 mi SE of the center of Chapel Hill; 35°31'N, 79°01'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 12.55 ha = 31 acres. **Description of Plot:** See AB 31:41 (1977). **Coverage:** April 6-June 16; 12 visits at approximately weekly intervals between dawn and 0930 hours. Total party-hours: 26. **Census:** Red-eyed Vireo, 16 (128, 52), Carolina Wren, 7 (56, 23); Tufted Titmouse, 6.5 (52, 21), Wood Thrush, 6 (48, 19); Cardinal, 6; Red-bellied Woodpecker, 4 (32, 13); Carolina Chickadee, 4; Summer Tanager, 4; Blue-gray Gnatcatcher, 3.5 (28, 11); Hooded Warbler, 3 (24, 10); Yellow-throated Vireo, 2 (16, 6); Ovenbird, 2; Downy Woodpecker, 1.5; E. Wood Pewee, 1.5, Acadian Flycatcher, 1.5; White-breasted Nuthatch, 1.5, Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; Black-and-white Warbler, 1; Kentucky Warbler, 1; Great Horned Owl, +; Yellow-billed Cuckoo, +; Com. Flicker, +; Pileated Woodpecker, +; Blue Jay, +; Pine Warbler, +. **Total:** 26 species; 74 territorial males (590/km<sup>2</sup>, 239/100 acres). **Visitors:** Great Crested Flycatcher, Com. Crow, Com. Grackle. **Remarks:** Fledgling Blue Jays and Great Horned Owls were found. Although a number of species changed substantially in abundance in comparison with last year, the most notable change was the absence of Scarlet Tanagers. — *M. CROTEAU, C. DAL MOLIN, S. HALL (co-compiler), D. KENNEDY, H. MUELLER, S. O'BRYAN, J. ROBINSON, P. SPIEGEL, J. WHITEHEAD, H. WILEY (co-compiler), H. WILSON, Dept. of Zoology, Univ. of North Carolina, Chapel Hill, N.C. 27514.*

**30. MIXED DECIDUOUS FOREST.** — **Location:** North Carolina; Orange Co., 4.5 mi N of Chapel Hill on N.C. Highway 86; Duke Natural Area; 35°59'N, 79°04'W, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973; 5 consecutive years. **Size:** 8.8 ha = 21.8 acres. **Description of Plot:** See AB 27:1018-1019 (1973). **Weather:** Severely cold winter and warm, dry spring preceded census. **Coverage:** April 13, 20, 30; May 6, 12, 16; June 4, 11, 18, 29; July 2, 9; 0615-0945. Total party-hours: 19.5. **Census:** Red-eyed Vireo, 12 (136, 55); Acadian Flycatcher, 9 (102, 41); Ovenbird, 6.5 (74, 30); Wood Thrush, 5 (57, 23); Red-bellied Woodpecker, 3 (34, 14), Carolina Chickadee, 2.5; Scarlet Tanager, 2.5; Tufted Titmouse, 2; N. Parula, 2; Louisiana Waterthrush, 2; Yellow-billed Cuckoo, 1.5; Carolina Wren, 1.5, Cardinal, 1.5; Hairy Woodpecker, 1; Downy Woodpecker, 1; Yellow-throated Vireo, 1; Hooded Warbler, 0.5; Barred Owl, +; Blue Jay, +; Com. Crow, +; White-breasted Nuthatch, +; Pine Warbler, +; Brown-headed Cowbird, +; Summer Tanager, +. **Total:** 24 species; 54.5 territorial males (618/km<sup>2</sup>, 250/100 acres). **Visitors:** Red-tailed Hawk, Bobwhite, Mourning Dove, Blue-gray Gnatcatcher, Com. Grackle, Am. Goldfinch, Rufous-sided Towhee. **Remarks:** Four nests were located: Acadian Flycatcher 1, Carolina Chickadee 1, Ovenbird 2. The severe winter may have been the cause of the notable decrease in Carolina Wrens (6.5 males last year). This was only partly offset by increases in Acadian Flycatcher and Ovenbird (6 and 5 males last year, respectively). Peripheral species appearing this year, rarely in past, include Barred Owl, Yellow-billed Cuckoo, and Yellow-throated Vireo. — *MARK HUFF, CHARLIE SAUNDERS, JOHN HORN (compiler), Dept. of Botany, Duke Univ., Durham, N.C. 27706.*

**31. MOUNTAIN RAVINE MIXED FOREST.** — **Location:** Georgia; Rabun Co., headwaters of Cuttingbone Creek in the Chattahoochee Nat'l Forest, 4 mi SSE of Clayton. **Continuity:** Established 1969; 9 consecutive years. **Size:** 5.9 ha = 14.7 acres. **Description of Plot:** See AFN 23:710-711 (1969). There have been no perceptible changes in the mature forest cover in the last year. **Weather:** April through June temperatures were above normal; rainfall was irregular and below normal. **Coverage:** April 13, 16; May 9, 11, 15, 18, 22, 26, 28, 30, June 1, 3, 5, 8, 12, 16, 19, 22, 26, 29; July 3; daylight-0930 EDT. Total man-hours: 58. **Census:** Acadian Flycatcher, 6 (99, 41), Red-eyed Vireo, 6; Black-throated Green Warbler, 6; Worm-eating Warbler, 5 (82, 34); Black-and-white Warbler, 4 (67, 27); Hooded Warbler, 4, Tufted Titmouse, 3 (49, 20); Cardinal, 3; Blue Jay, 2, Carolina Chickadee, 2; Carolina Wren, 2; Yellow-billed Cuckoo, 1; Screech Owl, 1; Pileated Woodpecker, 1, Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Wood Thrush, 1; Ovenbird, 1, Scarlet Tanager, 1; Com. Flicker, +; Com. Crow, +, White-breasted Nuthatch, +; Yellow-throated Vireo, +, Swainson's Warbler, +; Louisiana Waterthrush, +. **Total:** 26 species; 52 territorial males (855/km<sup>2</sup>, 354/100 acres). **Remarks:** One brood of Screech Owls and several broods of Worm-eating Warblers were found. Louis Schweitzer, R. C. Stringer, Jeannine Angerman and Caroline G. Newhall assisted on the census. — *E. O. MELLINGER, Tiger, Ga. 30576.*

**32. MIXED FOREST.** — **Location:** Ontario; Norfolk Co., Conc. 3, Lots 15-16, South Walsingham Twp, 42°40'N, 80°29'W. **Continuity:** New. **Size:** 10.1 ha = 25 acres, measured with steel tape and compass, square. **Description of Plot:** The dominant canopy trees are White Oak (*Quercus alba*), Red Oak (*Q. rubra*) and Red Maple (*Acer rubrum*) while Witch Hazel (*Hamamelis virginiana*) and Red Maple are most abundant in the understory. The plot is a basin with higher ground on all sides except the east. It was ankle deep in water during the spring and early summer but became dry by fall. Ground vegetation in the swampy central part was dominated by Royal Fern (*Osmunda regalis*) with several other fern species also common. Spring ephemerals were common on the drier edges of the plot. Two species of trees gave a southern aspect to the forest: Black Gum (*Nyssa sylvatica*) and Tulip-tree (*Liriodendron tulipifera*). A few large White Pine (*Pinus strobus*) were scattered through the plot. An extensive planting of Red Pine (*P. resinosa*) to the west extended a short distance into the NW corner on the high ground there. The woody vegetation was sampled along four of the surveyed lines at four-chain intervals and recorded in eight 0.05 acre subplots along each of the four lines. The relative importance of the 42 species encountered was calculated by adding relative density, relative basal area and relative frequency in the 32 subplots. The more important species are listed in the order of importance with the figures after each giving the relative number, basal area and frequency in that order. Red Maple, 21, 16, 8; Witch Hazel, 27, 2, 7; White Oak, 1.4, 21, 5.5; Red Oak, 1.3, 18, 4.5; Beech (*Fagus grandifolia*), 5, 10, 7; White Ash (*Fraxinus americana*), 2.6, 11, 5; White Pine, 2, 7, 5.5; Maple-leaved Viburnum (*Viburnum acerifolium*), 8, 0.04, 6; Yellow Birch (*Betula lutea*), 4, 3, 6.6; Flowering Dogwood (*Cornus florida*), 6, 0.7, 5; Black Gum, 2.3, 3.4, 2.4; Green Ash (*F. pennsylvanica*), 3.5, 0.4, 4.2; Grape (*Vitis* sp.), 3.7, 0.2, 2.4,

Tulip-tree, 0 6, 2 7, 2 1, Sugar Maple (*A. saccharum*), 1 3, 0 4, 3 4; Spicebush (*Lindera benzoin*), 1 6, 0 01, 2 4; Hop Hornbeam (*Ostrya virginiana*), 1 4, 0 1, 2 4; *Sassafras albidum*, 1 1, 0 02, 2 6, and Red Pine, 0 5, 2 4, 0 3. Red Oak had the greatest basal area on 11 of the 32 subplots, with White Oak on 6, White Ash on 5, White Pine on 3, Beech and Red Maple on 2 each and Tulip-tree, Red Pine, and Black Gum on one each. Witch Hazel was the most numerous component on 14 of the 32 subplots, with Red Maple on 12, Beech on 2 and Black Gum, grape, Flowering Dogwood and Red Pine on one each. **Edge:** The narrow, sandy access road lay about 60 ft N of the N boundary; on the higher ground to the W was a Red Pine plantation while mixed deciduous forest was continuous to the S, and for about 100 yards E. **Topography:** The sandy ridges bordering the plot rise about 20 to 30 ft above it, rather steeply in places. The whole region is in the Norfolk Sand Plain which slopes gently N and E from Lake Erie at an elevation of about 570 ft. **Weather:** After a very warm and dry May, June was rather rainy with more seasonable temperatures. **Coverage:** May 8-9, 28-29; June 4-5, 13-14, 21; mostly 0600-0800 and 1800-2000 but one trip to 2200. Total man-hours: 50. **Census:** Rose-breasted Grosbeak, 6 5 (63, 26); E. Wood Pewee, 4 (39, 16); Red-eyed Vireo, 4; Blue Jay, 3 5 (34, 14); Wood Thrush, 3 5; Great Crested Flycatcher, 2 5; Black-capped Chickadee, 2; Am. Robin, 2; Pine Warbler, 2; Veery, 1 5; Cedar Waxwing, 1 5; Scarlet Tanager, 1 5; Ruffed Grouse, 1; Whip-poor-will, 1; Hairy Woodpecker, 1; Yellow-throated Vireo, 1; Cerulean Warbler, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Mourning Dove, 0 5; Pileated Woodpecker, 0 5; Com. Crow, 0 5; White-breasted Nuthatch, 0 5; Red-breasted Nuthatch, 0 5; Ovenbird, 0 5; Indigo Bunting, 0 5; Yellow-billed Cuckoo, +; Great Horned Owl, +. **Total:** 28 species; 45 territories (435/km<sup>2</sup>, 180/100 acres).

**Remarks:** Ruffed Grouse with 10 and 8 downy young were found. Steven Price helped with the vegetation measurements. — ERICA NOL, CHRIS RISLEY, EDWARD RISLEY, ANN RIVERS, J. MURRAY SPEIRS (compiler), PHIL TAYLOR, SCOTT TRAQUAIR, Long Point Bird Observatory, Box 160, Port Rowan, Ont., Canada N0E 1M0.

**33. 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; 8 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 25:993 (1971). **Coverage:** May 24, 28; June 2-3, 6-8, 10, 14, 17, 19, 28, 30; 0615-0800. Total man-hours: 18 5 **Weather:** 3 days rainy, 2 days cloudy, 8 days sunny. Average temperature 62°F. **Census:** Great Crested Flycatcher, 5 (24, 10); Blue Jay, 5; Am. Robin, 5; Wood Thrush, 5; Com. Grackle, 4 (20, 8); Cardinal, 4; Indigo Bunting, 4; Downy Woodpecker, 2; E. Wood Pewee, 2; Gray Catbird, 2; Red-eyed Vireo, 2; Red-winged Blackbird, 2; N. Oriole, 2; Brown-headed Cowbird, 2; Mourning Dove, 1; Black-capped Chickadee, 1; Starling, 1; Song Sparrow, 1. **Total:** 18 species; 50 territorial males (245/km<sup>2</sup>, 101/100 acres). **Remarks:** The Indigo Buntings returned to 2 territories from last year; the Com. Flicker was lost as a breeding bird after 6 continuous years, the Song Sparrow continued its downward trend; the Gray Catbird returned after an absence of two years; 8 registrations of Swainson's Thrush occurred up to June

3, and one on June 10, but because of the timing and the scattered nature of the registrations I did not count it as a breeding bird. — GEORGE FAIRFIELD and ERIC NASMITH (compiler), 28 Donwoods Dr., Toronto, Ontario, Canada M4N 2G1.

**34. ASPEN-BIRCH FOREST.** — **Location:** Minnesota; Carlton Co., in the Cloquet Forestry Center, Univ. of Minnesota, SE 1/4, Sec. 32, T49N, R17W, Iverson Quadrangle, USGS. **Continuity:** New. **Size:** 20 5 ha = 50.6 acres. **Description of Plot:** Aspen (*Populus tremuloides* and *P. grandidentata*) and Paper Birch (*Betula papyrifera*) are the dominant tree species, with some scattered Red Pine (*Pinus resinosa*) present. The stand has a heavy Beaked Hazel (*Corylus cornuta*) understory. **Edge:** Bordered on the N and W by similar but younger vegetation, on the S by a narrow strip of planted Red Pine, and on the E by another Red Pine plantation, a shrubby (*Alnus-Salix*) lowland pocket, and some aspen-birch woodland. **Topography:** Essentially flat **Elevation:** 1250 ft. **Coverage:** May 31; June 1, 6-8, 16, 0530-0930. Total man-hours: 17.5. **Census:** Ovenbird, 10 (48, 19.5); Chestnut-sided Warbler, 9 (43, 18); Red-eyed Vireo, 8.5 (41, 17); Least Flycatcher, 5 (24, 10); Veery, 4 (19, 8); Mourning Warbler, 3.5 (17, 7); Red-breasted Nuthatch, 2; Com. Flicker, 1; Black-capped Chickadee, 1; E. Wood Pewee, 1; Scarlet Tanager, 1; Chipping Sparrow, 1; Hairy Woodpecker, 0.5; Blue Jay, 0.5; Nashville Warbler, 0.5; Blackburnian Warbler, 0.5; Black-billed Cuckoo, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; Am. Robin, +; Rose-breasted Grosbeak, +. **Total:** 21 species; 49 territorial males (234/km<sup>2</sup>, 97/100 acres). — DEANNA K. DAWSON and JOHN R PROBST, North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.

**35. MATURE ASPEN-NORTHERN HARDWOODS FOREST.** — **Location:** Minnesota; Cass Co., on the Pike Bay Experimental Forest, Chippewa National Forest, NE 1/4 of SE 1/4, Sec. 6, T144N, R30W; Pike Bay Quadrangle, USGS. **Continuity:** New. **Size:** 17 ha = 42 acres. **Description of Plot:** The dominant canopy species are aspen (*Populus tremuloides* and *P. grandidentata*) and Sugar Maple (*Acer saccharum*). Other canopy species include Basswood (*Tilia americana*), ash (*Fraxinus nigra* and *F. pennsylvanica*), Yellow Birch (*Betula alleghaniensis*), and an occasional Red Pine (*Pinus resinosa*). Sugar Maple seedlings and saplings are the most prominent components of the understory, with Red Maple (*A. rubrum*), Mountain Maple (*A. spicatum*), and Ironwood (*Ostrya virginiana*) seedlings. Alternate-leaved Dogwood (*Cornus alternifolia*), Leatherwood (*Drimia palustris*) and serviceberry (*Amelanchier* spp.) are also present. **Edge:** Bordered on the E and W by similar cover, and on the N and S by a younger hardwood forest. **Topography:** Essentially flat. **Elevation:** 1400 ft. **Coverage:** May 26, 29; June 4-5, 13, 20-21; 0600-1000. Total man-hours: 17. **Census:** Red-eyed Vireo, 17 (98, 40); Ovenbird, 11 (63, 26); Least Flycatcher, 4 (23, 10); Black-throated Green Warbler, 3 (17, 7); Veery, 2; Yellow-bellied Sapsucker, 1.5; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Yellow-throated Vireo, 1; N. Parula, 1; Scarlet Tanager, 1; E. Wood Pewee, 0.5; Black-capped Chickadee, 0.5; Broad-winged Hawk, +; Pileated Woodpecker, +; Blue Jay, +; Blackburnian Warbler, +; Brown Creeper, +; Am. Redstart,

+, Rose-breasted Grosbeak, + **Total:** 20 species, 44 5 territorial males ( $256/\text{km}^2$ , 106/100 acres). — **DEANNA K DAWSON and JOHN R. PROBST, North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.**

**36. UPLAND MAPLE-OAK FOREST.** — **Location:** Wisconsin; Waukesha Co., Falk Woods Nature Conservancy Area, 3 mi S of Waukesha, 2.5 mi S of intersection of County Highways A and F;  $42^\circ 56' \text{N}$ ,  $88^\circ 14' \text{W}$ , Muskego Quadrangle, USGS. **Continuity:** New. **Size:** 5.4 ha = 13.3 acres (quadrangular, E side, 193 m; S, 390 m; W, 83 m; N bounded by a footpath, approx. 405 m; planimetered from aerial survey map). **Description of Plot:** The major portion of the plot (about 90%) is a mesic forest approaching climax with the exception of a small area that was a clearing until about 15 or 20 years ago and is now overgrown into species such as Hawthorn (*Crataegus* spp.), sumac (*Rhus glabra*), and Bigtooth Aspen (*Populus grandidentata*). The dominant canopy trees are Sugar Maple (*Acer saccharum*), N. Red Oak (*Quercus borealis*), and White Ash (*Fraxinus americana*). Most prominent in the understory are Sugar Maple and E Hophornbeam (*Ostrya virginiana*). The ground cover is primarily May-apple (*Podophyllum peltatum*), *Trillium grandiflorum*, and Sugar Maple seedlings. A quantitative survey of the vegetation based on a quarter-point survey of 50 points gave the following results: Trees 3-in. diameter and over, 166/acre; total basal area, 151 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees Sugar Maple, 55, 33, 45, 26; E. Hophornbeam, 26, 16, 4, 16; N. Red Oak, 25, 15, 27, 16; White Ash, 17, 10, 8, 14; Shagbark Hickory (*Carya ovata*), 13, 8, 7, 10; Black Cherry (*Prunus serotina*), 10, 6, 2, 7; Bigtooth Aspen, 8, 5, 1, 3. Trees by diameter size class and shrub stems/acre N/A; ground cover 55%; canopy cover 80%; average canopy height 60 ft (range 25-75). **Edge:** Bordered on E side by a wide grassy roadside, S by hay meadow, W by similar forest, N by wet lowland mixed woods. **Topography:** A relatively steep north-facing slope of a moraine ridge. **Elevation:** 855-930 ft. **Weather:** Normal temperatures (45-90°F) and precipitation following an abnormally hot and dry month. **Coverage:** June 4, 12, 14, 16, 19, 22, 25, 27; July 3, 6; 0530-1000 except one trip 1530-1715. Total man-hours: 20. **Census:** Red-eyed Vireo, 4 (73, 30); Downy Woodpecker, 2; Great Crested Flycatcher, 2; Gray Catbird, 2; Brown Thrasher, 2; Am. Robin, 2; Wood Thrush, 2; Scarlet Tanager, 2; Com. Flicker, 1; Hairy Woodpecker, 1; Blue Jay, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; House Wren, 1; Ovenbird, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Song Sparrow, 1; Blue-winged Warbler, +; N. Oriole, +; Indigo Bunting, +. **Total:** 21 species; 28 territorial males or females ( $509/\text{km}^2$ , 211/100 acres). **Visitors:** Acadian Flycatcher, Am Crow, Starling, Bobolink, Savannah Sparrow, Field Sparrow. **Remarks:** 1 Am. Robin nest located. Fledglings noted Blue Jay and Black-capped Chickadee. Special thanks to David Steingraeber for the quantitative habitat description and Charles Weise for general assistance. — **VERNON D. AUNE, S. 13 W. 22167 Ridge Road, Waukesha, Wis. 53186.**

**37. MATURE MIXED HARDWOOD FOREST.** — **Location:** Michigan; Oakland Co., Southfield Civic Center Nature Area;  $42^\circ 30' \text{N}$ ,  $83^\circ 15' \text{W}$ , Royal Oak Quadrangle, USGS. **Continuity:** Established 1974; 4

consecutive years. **Size:** 9.3 ha = 23 acres. **Description of Plot:** See *AB* 28:1005-1006 (1974). **Weather:** Temperatures 28-68°F; max. wind 12 mph. Heavy overcast on two trips with slight rain, otherwise clear skies. **Coverage:** April 17, 20, 29; May 10, 12, 14, 17, 24, 26; June 14, 17, 20; July 1; 0525-0800, EDT. Total man-hours: 17.5. **Census:** Starling, 11 (116, 48); Cardinal, 8 (84, 35); Com Flicker, 7 (74, 30); Song Sparrow, 4.5 (47, 20); Ring-necked Pheasant, 4 (42, 17); Blue Jay, 4; Am. Robin, 4; Red-winged Blackbird, 3.5 (37, 15); Red-headed Woodpecker, 3; Downy Woodpecker, 3 (32, 13); Great Crested Flycatcher, 3; Com. Crow, 2; Tufted Titmouse, 2; House Wren, 2; Gray Catbird, 2; Wood Thrush, 2; Com Grackle, 2; N. Oriole, 2; Am. Goldfinch, 2; Canada Goose, 1; Mallard, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Red-eyed Vireo, 1; Ovenbird, 1; Bobwhite, +; Spotted Sandpiper, +; Killdeer, +; Black-capped Chickadee, +; Yellow Warbler, +. **Total:** 31 species; 78 territorial males ( $820/\text{km}^2$ , 339/100 acres). **Remarks:** Nests found: Com. Crow, 2; Canada Goose, 1; Com. Flicker, 1; Starling, 1. Young seen included 16 Mallard and 1 Am. Robin. General decrease in the number of singing males (from 88 in 1976), particularly in the more common species, might be due in part to the severe winter, however the Cardinal has increased over 1976. Several species were missing this year, notably Am. Kestrel, E. Kingbird, Veery, Scarlet Tanager and Indigo Bunting. Yellow Warbler was the only new species recorded. Thanks to Allen Charter, Ellie Cox, Esther Cusick and Elaine Drife without whose assistance this census would not have been completed. We also wish to extend our thanks to Southfield Civic Center for their continuing support. — **BETTY CHALLIS, Oakland Audubon Society, 2335 Pontiac Lk Rd., Pontiac, Mich. 48054.**

**38. OAK-HICKORY-MAPLE FOREST.** — **Location:** Illinois; McLean Co., Moraine View State Park, 3 mi S of Ellsworth; T22N, R4E, SE  $\frac{1}{4}$ , Sec 34, Arrowsmith Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 13 ha = 32 acres. **Description of Plot:** See *AB* 31:43 (1977). **Coverage:** June 13, 15, 17-19; 0600-0900. Total man-hours: 14. **Census:** Red-eyed Vireo, 3 (23, 9); Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Acadian Flycatcher, 2; House Wren, 2; Am. Robin, 2; Scarlet Tanager, 2; Cardinal, 2; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Red-headed Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Ovenbird, 1; Kentucky Warbler, 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Whip-poor-will, +; Com. Flicker, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 26 species; 32 territorial males ( $242/\text{km}^2$ , 100/100 acres). **Remarks:** Use of area by many foraging grackles increased utilization by birds but did not affect nesting density. The nesting population was similar to that of 1976 except Carolina Wren, Blue-gray Gnatcatcher, and Rufous-sided Towhee were absent, and Hairy Woodpecker appeared. — **DALE BIRKENHOLZ, Illinois State Univ., Normal, Ill. 61761.**

**39. UPLAND DECIDUOUS FOREST.** — **Location:** Illinois; Jackson Co., 3 mi ESE of Makanda at SW tip of Little Grassy Lake;  $37^\circ 36' \text{N}$ ,  $89^\circ 09' 30'' \text{W}$ , Makanda (not Lick Creek, as reported 1976) Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 6.15 ha = 15.2 acres

**Description of Plot:** See AB 31 44 (1976). **Weather:** Warmer, drier than normal. **Coverage:** May 22, 29; June 5, 7, 14-16, 23; 0500-0700. Total man-hours: 15. **Census:** Wood Thrush, 4 (64, 26); Acadian Flycatcher, 3 (48, 20); Kentucky Warbler, 3; Brown-headed Cowbird, 3 (females); E. Wood Pewee, 2; Tufted Titmouse, 2; Blue-gray Gnatcatcher, 2; Red-bellied Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Yellow-billed Cuckoo, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; Red-eyed Vireo, 1; N. Parula, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Summer Tanager, 1; Pileated Woodpecker, 0.5; Blue Jay, 0.5; White-breasted Nuthatch, 0.5; Barred Owl, +; Hairy Woodpecker, +; Worm-eating Warbler, +; Rufous-sided Towhee, +. **Total:** 24 species; 31.5 territorial birds ( $501/\text{km}^2$ , 207/100 acres). **Remarks:** Total number of territorial birds was only 68% of last year. Carolina Wrens were completely eliminated during the winter. Kentucky Warblers went down from 6 to 3. — *MICHAEL D. MORRISON, Southern Illinois Bird Observatory, P.O. Box 2471, Carbondale, Ill. 62901.*

**40. BLACK OAK-SASSAFRAS WOODS.** — **Location:** Indiana; Porter Co., 1.5 mi E intersection of Rts. 49 and 12, within Indian Dunes National Lakeshore, crossed by tared country road and lightly-used bridle path,  $41^\circ 39' \text{N}$ ,  $87^\circ 02' \text{W}$ , Dune Acres Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 22.22 ha = 54.9 acres. **Description of Plot:** Burned over (1971) wooded dune and sand prairies area making strong post-fire recovery. Some areas impenetrable now because of suckers and dead branches. Park has removed some large dead trees. See AB 28:6 1007 (1974). **Weather:** Extremely severe winter reduced resident bird population. Late frosts and extreme drought in May cut berry crops. **Coverage:** March 26-July 23; 28 trips usually before 0900 hours. Total man-hours: 68. **Census:** Rufous-sided Towhee, 10 (44, 18); Gray Catbird, 9 (40, 16); Field Sparrow, 8 (35, 15); Brown Thrasher, 6 (26, 11); Com. Flicker, 2; Red-headed Woodpecker, 2; Great Crested Flycatcher, 2; House Wren, 2; Golden-winged Warbler, 2; Com. Yellowthroat, 2; Mourning Dove, 1; Tufted Titmouse, 1; Veery, 1; Blue-winged Warbler, 1; N. Oriole, 1; Scarlet Tanager, 1; Indigo Bunting, 1. **Total:** 17 species; 52 territories ( $229/\text{km}^2$ , 95/100 acres). **Remarks:** Nest located: Field Sparrow. Nesting status uncertain: ubiquitous cowbirds, Am. Robin, Red-eyed Vireo, Am. Goldfinch. I hope reduced migrant bird population is a function of the drought. My thanks to James B. Hammond for help given. — *EMMA B. PITCHER, 1159 E. 56th St., Chicago, Ill. 60637.*

**41. POORLY DRAINED MIXED OAK FOREST.** — **Location:** Indiana, Newton Co. Willow Slough Fish and Wildlife Area, 4.5 mi NW of Morocco;  $40^\circ 59' 22'' \text{N}$ ,  $87^\circ 31' 09'' \text{W}$ , Donovan, Ill.-Ind., Quadrangle, USGS. **Continuity:** Established 1974; 2 intermittent years. **Size:** 11.05 ha = 27.3 acres. **Description of Plot:** See AB 28 1008 (1974). *Ind. Aud. Quart.* 53:96 (1975). **Weather:** Unusually hot and dry throughout period. **Coverage:** May 21, 30, June 1, 5, 14, 18-19, 25-26; July 20-21; 7 trips, 0455-0800 and 4 trips, 1620-2020. Total man-hours: 15. **Census:** Com. Yellowthroat, 6 (54, 22); Rufous-sided Towhee, 4 (36, 15); Yellow-billed Cuckoo, 3 (27, 11); Com. Flicker, 3; Blue Jay, 3; Gray Catbird, 3; Veery, 3; Hairy Woodpecker, 2; Brown-headed Cowbird, 2; Scarlet Tanager, 2; Screech Owl, 1; Whip-poor-will, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1;

Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Wood Thrush, 1; Ovenbird, 1; Kentucky Warbler, 1; N. Oriole, 1; Cardinal, 1; Indigo Bunting, 1; Great Horned Owl, +; Tufted Titmouse, +; Red-eyed Vireo, +. **Total:** 26 species; 44 territorial males or females ( $398/\text{km}^2$ , 161/100 acres). **Visitors:** White-breasted Nuthatch, Am. Robin, Com. Grackle, Summer Tanager and Am. Goldfinch. **Remarks:** The plot continued to change with yearly draining of two waterfowl management marshes to the W and drought conditions. The sedge marsh in the W corner was being encroached upon by new Pin Oak forest growth. Meanwhile, the aspen (which was missed in the selection of the random vegetation samples in 1974) on the E side of the marsh had stopped annual production of saplings. The Song and Swamp Sparrow territories on the marsh area in 1974 were gone in 1977. Six species showed drastic declines from 1974 levels; E. Wood Pewee, N. Oriole, Downy Woodpecker, Tufted Titmouse, Cardinal and Red-eyed Vireo. The Brown Thrasher was not detected. Changing conditions were apparently good for the new appearance of Yellow-billed Cuckoo, Wood Thrush, Ovenbird and Indigo Bunting. Although the Veery territories dropped by only one, the Wood Thrush may be replacing them slowly. One Wood Thrush territory was located between two closely placed Veery territories, and two other Wood Thrushes had territories on the edge of the plot. One of the nearby Wood Thrush territories replaced a Veery's found in 1974. — *EDWARD M. HOPKINS, 1185 Windsor Drive, West Lafayette, Ind. 47906.*

**42. MIXED HARDWOOD REGENERATING.** — **Location:** Ohio; Fairfield Co., Bern Township, 1 mi W of Sugar Grove and 6 mi S of Lancaster;  $82^\circ 30' \text{W}$ ,  $39^\circ 37' 30'' \text{N}$ , NE/4 Lancaster Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 20.2 ha = 50 acres. **Description of Plot:** See AB 31:45 (1977). **Weather:** Normal. **Coverage:** May 17-June 16; 9 trips, majority 0700-0900. Total man-hours: 27. **Census:** Wood Thrush, 9 (44, 18); Red-eyed Vireo, 5 (25, 10); Acadian Flycatcher, 4 (20, 8); Ovenbird, 4; White-breasted Nuthatch, 3 (15, 6); Kentucky Warbler, 3; E. Wood Pewee, 2; Carolina Chickadee, 2; Cardinal, 2; Rufous-sided Towhee, 2; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Tufted Titmouse, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Worm-eating Warbler, 1; N. Parula, 1; Hooded Warbler, 1; Scarlet Tanager, 1. **Total:** 23 species; 49 territorial males ( $242/\text{km}^2$ , 98/100 acres).

**Remarks:** Nests found: 2 Acadian Flycatchers, 1 Downy Woodpecker, 1 Wood Thrush, 1 Red-eyed Vireo. The Carolina Wren population was practically nonexistent (one was heard once). We think the very severe winter killed them. Most species were down to about one half of last year's totals. — *ANN BINGAMAN (compiler), TOM WOOD, ESTHER REICHELDERFER, GRANVILLE SMITH, JIM FRY and TOM THOMSON, Ohio Historical Society, 1982 Velma Avenue, Columbus, Ohio 43211.*

**43. MIXED MESOPHYTIC FOREST.** — **Location:** Ohio; Pike Co., Pike Lake State Park, 7 mi NW of Morgantown;  $39^\circ 10' 30'' \text{N}$ ,  $83^\circ 12' 12'' \text{W}$ , Morgantown Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 101.2 ha = 250 acres. **Description of Plot:** See AB 31 45-46 (1977). **Edge:** Bordered on all sides by similar forest

**Topography:** Smooth high rolling hills. **Elevation:** 754-1237 ft. **Weather:** Very hot and humid with temperatures between 95-100°F. It rained on two days. **Coverage:** June 19; July 16-23; 0800-2300. Total man-hours: 40. **Census:** Am. Robin, 12 (12, 5); Chipping Sparrow, 9 (9, 4); Wood Thrush, 7.5 (7, 3); Red-eyed Vireo, 7.5; Com. Grackle, 6.5 (6, 3); Turkey Vulture, 6 (6, 2), Barn Swallow, 6; Barred Owl, 5 (5, 2); House Sparrow, 5; Mourning Dove, 4.5 (4, 2); Acadian Flycatcher, 4.5; Purple Martin, 4.5; Chimney Swift, 4 (4, 2); Cedar Waxwing, 4; Yellow-throated Warbler, 4; Downy Woodpecker, 3.5 (3, 1); E. Wood Pewee, 3.5; Scarlet Tanager, 3.5, Am. Goldfinch, 3.5; Screech Owl, 3 (3, 1); White-breasted Nuthatch, 3; Ovenbird, 3; Red-winged Blackbird, 3; Carolina Chickadee, 2.5; Gray Catbird, 2.5; Yellow-billed Cuckoo, 2; Com. Flicker, 2; Pileated Woodpecker, 2; Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; Com. Crow, 2; Starling, 2; N. Parula, 2; Brown-headed Cowbird, 2; N. Oriole, 2; Indigo Bunting, 2; Whip-poor-will, 1.5; Least Flycatcher, 1.5; Tufted Titmouse, 1.5; Blue-gray Gnatcatcher, 1.5; Warbling Vireo, 1.5; Yellow Warbler, 1.5; Cardinal, 1.5; Rufous-sided Towhee, 1.5; Red-tailed Hawk, 1; Black-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Belted Kingfisher, 1; Blue Jay, 1; Yellow-breasted Chat, 1; Kentucky Warbler, 1; Am. Redstart, 0.5 **Total:** 52 species; 162.5 territorial males ( $161/\text{km}^2$ , 65/100 acres). **Remarks:** Nests found: Purple Martin (3), Am. Robin (1), Cedar Waxwing (1), House Sparrow (1), Red-winged Blackbird (1). Special thanks to Marty Hall for help in calling in owls. — *CLIFF CATHERS, 24 Greenian Ave., Trotwood, Ohio 45426.*

**44. VIRGIN BEECH-MAPLE FOREST.** — **Location:** Ohio; Preble Co., Hueston Woods State Park, 4 mi N of Oxford near the intersection of Brown and Main Loop Roads; E ½, SE ¼ Sect. 34, T6N, R1E, College Corner Quadrangle, USGS. **Continuity:** Established 1973, 5 consecutive years. **Size:** 6.1 ha = 15 acres. **Description of Plot:** See AB 28:1009-1010 (1974). **Weather:** Early May was unseasonably cold but followed by slightly warmer-than-usual temperatures. Spring was unseasonably dry. **Coverage:** May 7-8, 13-16, 19, 21-22, 28, 30-31; June 4; 0530-0900. Total: 30 man-hours. **Census:** Red-eyed Vireo, 10.5 (173, 70); Acadian Flycatcher, 9 (148, 60); Blue-gray Gnatcatcher, 9; Cerulean Warbler, 7.5 (124, 50); Cardinal, 4.5 (74, 30); Red-headed Woodpecker, 2.5; Tufted Titmouse, 2.5; Yellow-breasted Nuthatch, 2.5; Wood Thrush, 2.5; Ovenbird, 2.5; Brown-headed Cowbird, 2.5; Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Yellow-billed Cuckoo, 1.5; Downy Woodpecker, 1.5; Scarlet Tanager, 1.5; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Carolina Chickadee, 1; Gray Catbird, 1; Starling, 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1; House Sparrow, 1; Indigo Bunting, 1; Great Horned Owl, 0.5; Barred Owl, 0.5; Blue Jay, 0.5; Com. Crow, 0.5; Hairy Woodpecker, +. **Total:** 32 species; 78 territorial males or females ( $1285/\text{km}^2$ , 520/100 acres). **Remarks:** Nests for Red-headed Woodpecker (2), Starling, Red-eyed Vireo and House Sparrow were found. No Carolina Wrens were present as the preceding winter destroyed the local population. Densities of territorial males were the lowest of the 5 previous years with populations of Tufted Titmouse and Carolina Chickadee dropping 60 and 75% below normal. Thanks to Tom Runyan and Dorothy Behlen for field assistance and the

Ohio Dept. of Natural Resources for permission to make this study. — *STEVEN R. BEISSINGER and DIANA L. ADAMS, Dept. of Zoology, Miami University, Oxford, Ohio 45056.*

**45. VIRGIN SCRUB OAK FOOTHILLS.** — **Location:** Oklahoma; Osage Co., from intersection U S 60 and Okla. 123, 5 mi W and 2½ mi SW; 96°06'N, 36°44'W, Woolaroc Quadrangle, 7.5 min. series USGS, SW ¼ of SE quarter of Sec. 10-26-11. **Continuity:** Established 1975; 3 consecutive years. **Size:** 16.19 ha = 40 acres. **Description of Plot:** See AB 29: 1098 (1975) **Weather:** Dry mild spring following very dry winter **Coverage:** April 11, 25; May 2, 5, 9, 16, 23, 31; June 7, 15. One afternoon trip, all others dawn-1000, CT. Total man-hours: 21. **Census:** Great Crested Flycatcher, 5 (31, 13); Field Sparrow, 5; Bewick's Wren, 4 (25, 10); Black-and-white Warbler, 4; Brown-headed Cowbird, 4; Yellow-billed Cuckoo, 3 (19, 8); Tufted Titmouse, 3; White-breasted Nuthatch, 2; Brown Thrasher, 2; Blue-gray Gnatcatcher, 2; Cardinal, 2; Carolina Chickadee, 1.5; Bobwhite, 1; Mourning Dove, 1; Red-bellied Woodpecker, 1; Blue Jay, 1; Yellow-breasted Chat, 1; Red-winged Blackbird, 1; Summer Tanager, 1; Painted Bunting, 1; Chipping Sparrow, 1; Com. Flicker, 0.5, Lark Sparrow, 0.5; Great Horned Owl, +; Chuck-will's-widow, +; Pileated Woodpecker, +; E. Bluebird, +; White-eyed Vireo, +. **Total:** 28 species; 47.5 territorial males ( $293/\text{km}^2$ , 119/100 acres). **Remarks:** One Chipping Sparrow nest was found. The woodpecker population was down, no Red-headed or Downy Woodpecker, no Carolina Wren. Birds seemed less vocal this year. No domestic animals grazed the plot although they had in previous years. — *DOTTY M. GOARD, P.O. Box 591, Bartlesville, Okla. 74003.*

**46. DECIDUOUS - CONIFEROUS SECOND-GROWTH NORTHWOODS.** — **Location:** Vermont, Washington Co., SW corner Cabot; 44°23'N, 72°23'W, Plainfield Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 15 ha = 37 acres. **Description of Plot:** See AB 26: 957-8 (1972). **Coverage:** April 28-June 4; 26 early morning trips. Total man-hours: 31. **Weather:** Temperature range 26-60°F (average 44°); 75% clear. An abnormally dry spring. **Census:** White-throated Sparrow, 7 (47, 19); Veery, 5 (33, 14); Ovenbird, 5; Nashville Warbler, 3 (20, 8); Song Sparrow, 3; Black-capped Chickadee, 2; Am. Robin, 2; Black-and-white Warbler, 2; Magnolia Warbler, 2; Yellow-rumped Warbler, 2; Chestnut-sided Warbler, 2; Canada Warbler, 2; Ruffed Grouse, 1; Red-breasted Nuthatch, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Black-throated Blue Warbler, 1; Black-throated Green Warbler, 1; Blackburnian Warbler, 1; Mourning Warbler, 1; Com. Yellowthroat, 1; Chipping Sparrow, 1; Hermit Thrush, 0.5. **Total:** 23 species; 47.5 territorial males ( $317/\text{km}^2$ , 128/100 acres). **Visitors:** Blue Jay, Brown Creeper, Ruby-crowned Kinglet, Solitary Vireo, Am. Redstart, Purple Finch. **Remarks:** Eight nests were found Red-breasted Nuthatch, 1; Am. Robin, 2; Com. Yellowthroat, 1; Ovenbird, 1; Magnolia Warbler, 1 (including one cowbird egg); White-throated Sparrow, 1; Song Sparrow, 1. — *BARBARA CARPENTER, Marshfield, Vt. 05658*

**47. MAPLE-PINE-OAK SECOND-GROWTH FOREST.** — **Location:** Massachusetts; Norfolk Co., Town of Foxboro conservation land, off Willow and East Streets; 42°04'N, 71°11'30"W, Mansfield Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 11.8 ha = 29.2 acres. **Description of Plot:** See AB 31:50-51 (1977). **Weather:** For nearby Boston the temperature for May was 4°F above normal, for June 0.6° below; rainfall in May was 0.05 inches above normal, for June 0.7 inches below. Approximately 8 in. of snow fell on May 10. **Coverage:** May 4, 17-18, 22, 24, 26-27; June 7-9, 13-14; July 5; 0600-1115. Total man-hours: 26. **Census:** Ovenbird, 6 (51, 21); Blue Jay, 5 (42, 17); Black-capped Chickadee, 4 (34, 14); Gray Catbird, 4; Veery, 4; Scarlet Tanager, 4; White-breasted Nuthatch, 3 (25, 10); Black-and-white Warbler, 3; Com. Yellowthroat, 3; Com. Grackle, 3; Rufous-sided Towhee, 3; Wood Thrush, 2.5; Tufted Titmouse, 2; Blue-winged Warbler, 2; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Downy Woodpecker, 1; Am. Robin, 1; Blue-gray Gnatcatcher, 1; Nashville Warbler, 1; N. Oriole, 1; Cardinal, 1; Field Sparrow, 1; Com. Flicker, 0.5; Hairy Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Red-eyed Vireo, 0.5; Broad-winged Hawk, +. **Total:** 28 species; 59.5 territorial males or females ( $504/\text{km}^2$ , 204/100 acres). **Remarks:** Brown-headed Cowbirds and a pair of Wood Ducks were observed twice. The April aerial spraying of the mosquito larvicide fenthion of the past five years was discontinued this spring. The 7-year-old trees and shrubs of the 1-acre field were cut in May. This correlated with the disappearance of the pair of Brown Thrashers that had nested there for several years. The severe winter and/or Goshawk predation may account for the disappearance of Ruffed Grouse. — *WILLIAM E. DAVIS, JR., College of Basic Studies, Boston Univ., Boston, Mass. 02215.*

**48. 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; 11 intermittent years. **Size:** 10.52 ha = 26 acres. **Description of Plot:** See AFN 19:594-595 (1965). **Coverage:** June 3-5, 7, 9, 14, 0500-1900. Total man-hours: 20.5. **Census:** Blackburnian Warbler, 14 (133, 54); Ovenbird, 9.5 (90, 37); Veery, 8 (76, 31); Black-throated Green Warbler, 6.5 (62, 25); Red-breasted Nuthatch, 6 (57, 23); Solitary Vireo, 5 (48, 19); Scarlet Tanager, 5; Red-eyed Vireo, 4.5 (43, 17); Brown Creeper, 4 (38, 15); Blue Jay, 3 (29, 12); Great Crested Flycatcher, 2; Black-capped Chickadee, 2; Wood Thrush, 2; Purple Finch, 2; Rufous-sided Towhee, 2; Com. Flicker, 1.5; Broad-winged Hawk, 1; Barred Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Com. Crow, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Black-and-white Warbler, 1; Brown-headed Cowbird, 1; Pileated Woodpecker, 0.5; Gray Catbird, +; Com. Yellowthroat, +; N. Oriole, +; Cardinal, +; Song Sparrow, +. **Total:** 33 species; 88.5 territorial males ( $841/\text{km}^2$ , 340/100 acres). **Remarks:** Total numbers rose a surprising 20% from the previous year to a record high for this census area, despite the loss of Canada Warblers, White-throated Sparrows, House and Winter Wrens and N. Waterthrush. The largest gains were Blackburnian Warbler from 9 to 14 (the greatest density of any species recorded on this plot); Red-breasted Nuthatch (from 2 to 6); and Red-eyed Vireo (from 1 to 4.5). A March snow-and-ice

storm bent, broke, or toppled many large and small trees, creating new canopy breaks. Special thanks to Jim Cavanaugh for his help. — *ANDREW MAGEE, 34 Hobson St., Springfield, Mass. 01109.*

**49. UPLAND MIXED PINE-SPRUCE-HARDWOOD PLANTATION.** — **Location:** New York, Allegany Co., on the S side of Brown Rd., near its intersection with the Vandermark Rd., in the town of Ward, 3.5 mi W of Alfred, 42°7'30"N, 77°45'W; Andover Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 16.6 ha = 41 acres. **Description of Plot:** See AB 28:699 (1974). **Weather:** Alfred Cooperative Weather Station data indicate that precipitation during May, June and July was near normal. Average mean daily temperatures during June and July were within normal range but May was a full 10°F warmer than the 57-year average. **Coverage:** May 20, 25; June 1, 7, 13, 18; July 12, 17, 23, 30; 0900-1145, EDT. Total man-hours: 16. **Census:** Black-throated Green Warbler, 13 (78, 32); Blackburnian Warbler, 12 (72, 29); Magnolia Warbler, 10 (60, 24); Dark-eyed Junco, 7 (42, 17); Blue Jay, 4 (24, 10); Black-capped Chickadee, 4; Golden-crowned Kinglet, 4; Ovenbird, 4; Solitary Vireo, 3 (18, 7); Com. Yellowthroat, 3; Brown Creeper, 2; Am. Robin, 2; Brown-headed Cowbird (females), 2; Indigo Bunting, 2; Chipping Sparrow, 2; Broad-winged Hawk, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Wood Thrush, 1; Veery, 1; Cedar Waxwing, 1; Yellow-rumped Warbler, 1; Canada Warbler, 1; Cardinal, 1; Song Sparrow, 1; Red-shouldered Hawk, +; Pileated Woodpecker, +; Great Crested Flycatcher, +; House Wren, +. **Total:** 31 species; 86 territorial males ( $518/\text{km}^2$ , 210/100 acres). **Remarks:** 1 Black-capped Chickadee nest was found. There was a 20% decline in territorial males from the all-time high in 1976. Appreciation is extended to Gaylord Rough for weather data. — *ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N.Y. 14803.*

**50. MOUNTAIN TOP, MIXED HARDWOOD AND WHITE PINE FOREST.** — **Location:** Pennsylvania, Westmoreland Co. 10 mi SSW of Ligonier, 6 mi S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; 40°07'18"N, 79°10'47"W, Bakersville Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28:1014 55 (1974). **Weather:** sunny, except for one rainy day; mostly warm and clear. **Coverage:** June 4-5, 7, 11-12; 0500-0930, 1200-1300, and 1700-1930 Total party-hours: 17.5. **Census:** Red-eyed Vireo, 7 (115, 47); Ovenbird, 3.5 (58, 23); Rufous-sided Towhee, 3 (49, 20); Dark-eyed Junco, 2.5; Veery, 2; Solitary Vireo, 2; Canada Warbler, 2; Scarlet Tanager, 2; Black-throated Blue Warbler, 1.5; Ruffed Grouse, 1; Hermit Thrush, 1; Black-and-white Warbler, 1; Com. Yellowthroat, 1; Chipping Sparrow, 1; Great Crested Flycatcher, +; Com. Crow, +; Black-capped Chickadee, +; House Wren, +; Chestnut-sided Warbler, +; Indigo Bunting, +. **Total:** 20 species; 30.5 territorial males ( $502/\text{km}^2$ , 203/100 acres). **Visitors:** Blue Jay, Gray Catbird, Wood Thrush, Magnolia Warbler, Black-throated Green Warbler. **Remarks:** Female Ruffed Grouse with brood of 12 flushed from plot. — *R. CARRELL ABBOTT (compiler), Audubon Society of Western Pennsylvania, Pittsburgh, Pa. 15213.*

**51. OAK-PINE FOREST.** — **Location:** West Virginia, Monroe Co. 0.5 mi E of Waiteville; starts at 37°28'35"N, 80°24'40"W and extends ESE; Waiteville Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, length measured, width estimated). **Description of Plot:** A mixed forest last logged before 1925. The dominant canopy trees are Chestnut Oak (*Quercus prinus*) and Table Mountain Pine (*Pinus pungens*). Most prominent in the understory are blueberries (*Vaccinium* sp.), Mountain Laurel (*Kalmia latifolia*), and *Azalea* sp. The ground cover is primarily the smaller blueberries, some Teaberry (*Gaultheria procumbens*), and *Galax aphylla*. A quantitative vegetation survey of six 0.1 acre samples gives: Trees 3 in. dbh and over 468/acre, total basal area 139.5 ft<sup>2</sup>/acre. Species comprising 92% of the total number of trees: Chestnut Oak, 173, 37, 42, 100; Black Oak (*Q. velutina*), 27, 6, 4, 83; Scarlet Oak (*Q. coccinea*), 23, 5, 11, 83; Red Oak (*Q. rubra*), 18, 4, 3, 50; Table Mountain Pine, 63, 14, 20, 67; Red Maple (*Acer rubrum*), 32, 7, 5, 83; Sourwood (*Oxydendrum arboreum*), 30, 6, 4, 50; dead trees, 62, 13, 8, 100. Trees by diameter size class: A (3-6 in.) 255, 55, 25.5, 18; B (6-9 in.) 122, 26, 36.6, 26; C (9-15 in.) 87, 19, 69.3, 50; D (15-21 in.) 2, 1, 3, 2; E (21-27 in.) 2, 1, 5.2, 4. Shrub stems/acre 16,000; ground cover 33%; canopy cover 86%; average canopy height 55 ft (range 50-63). **Edge:** The forest continues on all sides. **Topography:** The centerline follows a narrow ridge from elevation 2425 to 2495 ft. The N edge is 50-75 ft lower while the S edge is less than 40 ft lower than the centerline. **Weather:** Warm and dry. **Coverage:** May 19-22; 13 trips, dawn-0900 and one evening trip. Total party-hours: 10. **Census:** Ovenbird, 4 (66, 27), Red-eyed Vireo, 3.5 (58, 23); Tufted Titmouse, 2; Blue-gray Gnatcatcher, 2; Pine Warbler, 2; Scarlet Tanager, 2; Hooded Warbler, 1.5; Great Crested Flycatcher, 1, E Wood Pewee, 1; Yellow-throated Vireo, 1; Rufous-sided Towhee, 1; Broad-winged Hawk, +; Ruffed Grouse, +; Turkey, +; Yellow-billed Cuckoo, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Com. Crow, +; White-breasted Nuthatch, +; Worm-eating Warbler, +. **Total:** 20 species; 21 territorial males (346/km<sup>2</sup>, 140/100 acres). — *GEORGE HURLEY* (compiler), *NEVADA LAITSCH*, and other members, *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

**52. OAK-PINE FOREST.** — **Location:** West Virginia, Hardy Co., Loblolly Trail in Lost River State Park; 38°52'57"N, 78°55'49"W, Lost River State Park 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 oak and Pitch Pine (*Pinus rigida*). Most prominent in the understory are blueberry (*Vaccinium* sp.) and Mountain Laurel (*Kalmia latifolia*). The ground cover is primarily seedlings of blueberry and the canopy trees. A quantitative vegetation survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six circular samples, 253/acre; total basal area 86.5 ft<sup>2</sup>/acre. Species comprising 89% of the total number of trees: Chestnut Oak (*Quercus prinus*), 132, 52, 49, 83; Red Oak (*Q. rubra*), 18, 7, 4, 50; Black Oak (*Q. velutina*), 18, 7, 2, 67; White Oak (*Q. alba*), 8, 3, 1, 33, Pitch Pine 42, 16, 22, 67; Black Locust (*Robinia pseudo-acacia*) 10, 4, 3.5, 50. Trees by diameter size class A (3-6 in.) 130, 51, 13, 15; B (6-9 in.) 70, 27, 21, 24; C (9-15 in.) 45, 17, 36, 41; D (15-21 in.) 6.7, 3, 12, 14; E (21-27 in.) 1.6, .7, 5.1, 6. Shrub stems/acre 24,000;

ground cover 43%, canopy cover 83%, average canopy height 55 ft (range 43-85). **Edge:** Bordered on all sides by similar habitat. **Topography:** Steep, west-facing slope. **Elevation:** 2300-2450 ft. **Weather:** Cool and dry with fog most mornings. **Coverage:** June 4-7; dawn-800 or 1900-2100. Total party-hours: 7. **Census:** Acadian Flycatcher, 2; Am. Robin, 2; Wood Thrush, 2; E. Wood Pewee, 1.5, Great Crested Flycatcher, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Worm-eating Warbler, 1; Cerulean Warbler, 1; Am. Redstart, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Black-and-white Warbler, 0.5; Whip-poor-will, +; Least Flycatcher, +; White-breasted Nuthatch, +; Ovenbird, +; Chipping Sparrow, +. **Total:** 22 species; 20 territorial males or females (329/km<sup>2</sup>, 133/100 acres). **Visitors:** Com. Crow, Pileated Woodpecker, Brown-headed Cowbird. **Remarks:** One wood pewee nest was found. Chickadees, nuthatches and gnatcatchers were seen with young out of the nest. — *BOB HOSTOTTE* and *ANNE EDDY* (compiler), *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

**53. OAK-PINE-HICKORY FOREST.** — **Location:** West Virginia; Hardy Co., 5 mi NW from Mathias, 38°55'35"N, 78°56'31"W, Lost River State Park Quadrangle, USGS; extends N curving W. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 × 660 yds, length measured, width estimated). **Description of Plot:** A mixed forest undisturbed since 1940. The dominant canopy trees are Table Mountain Pine (*Pinus pungens*), Red Oak (*Quercus rubra*), and Chestnut Oak (*Q. prinus*). Prominent in the understory are blueberry (*Vaccinium* sp.), Scrub Oak (*Q. ilicifolia*), and Black Locust (*Robinia pseudo-acacia*). The ground cover is mostly the smaller blueberries with Goldenrod (*Solidago erecta*), Pussytoes (*Antennaria virginica*), and a few ferns and grasses. A quantitative vegetation survey of six 0.1 acre samples gives: Trees 3 in. dbh and over 382/acre, total basal area 109.2 ft<sup>2</sup>/acre. Species comprising 91% of the total number of trees: Red Oak, 80, 21, 25, 100; Chestnut Oak, 93, 24, 25, 100; Table Mountain Pine, 58, 15, 26, 67; Pitch Pine (*P. rigida*), 18, 5, 5, 67; Pignut Hickory (*Carya glabra*), 72, 19, 9, 83; dead trees, 27, 7, 4, 100. Trees by diameter size class: A (3-6 in.) 202, 53, 20, 2, 18, B (6-9 in.) 113, 30, 33.9, 31; C (9-15 in.) 65, 17, 52, 48, D (15-21 in.) 2, 1, 3, 3. Shrub stems/acre 9370; ground cover 31%; canopy cover 75%; average canopy height 48 ft (range 40-60). **Edge:** Forest continues on all sides. **Topography:** Centerline about level a few feet above the 2400 ft contour. Sidehill plot 60-200 ft below ridge, SW exposure. Fall 80-150 ft across plot. **Weather:** Clear and dry first day, then cool, wet and windy. **Coverage:** June 5, 7-9; 10 trips, dawn-0800 and one evening trip. Total party-hours: 8. **Census:** Ovenbird, 2.5; Rufous-sided Towhee, 2; Pine Warbler, 1.5; Black-capped Chickadee, 1; Downy Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Tufted Titmouse, 0.5; Rose-breasted Grosbeak, 0.5; Pileated Woodpecker, +; Hairy Woodpecker, +; E Wood Pewee, +; Blue Jay, +; White-breasted Nuthatch, +; Wood Thrush, +; Brown-headed Cowbird, +; Scarlet Tanager, +. **Total:** 16 species; 9 territorial males (148/km<sup>2</sup>, 60/100 acres). **Remarks:** This area of shale soils and low rainfall (less than 40 in./year), where the trees mature and start to deteriorate before reaching a good saw log size, does not support high bird populations. The

extremely dry weather this spring may have discouraged some possible breeders. — *NEVADA LAITSCH* and *GEORGE KOCH* (compilers), *JEAN ANDERSON*, *RICHARD DIENER*, *KATHLEEN FINNEGAR*, *GEORGE A. HALL*, *EDWARD INGENFRITZ*, *STUART ROBBINS*, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

**54. OAK-PINE WOODLAND.** — **Location:** West Virginia; Hardy Co., 4.7 mi NW of Mathias; 38°54'37"N, 78°56'01"W, Lost River State Park Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 150 acres (rectangular, 110 x 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are oak, pine and hickory. Most prominent in the understory are blueberry (*Vaccinium* sp.) and Flowering Dogwood (*Cornus florida*). The ground cover is primarily grasses (*Carex* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on six 0.1 acre circular samples, 216/acre; total basal area 103 ft<sup>2</sup>/acre. Species comprising 95% of the total number of trees: Chestnut Oak (*Quercus montana*), 28, 13, 27, 67; White Oak (*Q. alba*), 30, 14, 23, 83; Black Oak, (*Q. velutina*), 23, 11, 9, 50; Red Oak (*Q. rubra*), 23, 11, 6, 83; Virginia Pine (*Pinus virginiana*), 20, 9, 6, 33; White Pine (*P. strobus*), 13, 6, 3, 16; Pitch Pine (*P. rigida*), 7, 3, 2, 50; Table Mountain Pine (*P. pungens*), 3, 2, 1, 16; Pignut Hickory, (*Carya glabra*), 15, 7, 7, 67; Mockernut Hickory (*C. tomentosa*), 8, 4, 2, 50; dead trees, 17, 7, 9, 83. Trees by diameter size class: A (3-6 in.) 88, 41, 9, 9; B (6-9 in.) 62, 28, 18, 18; C (9-15 in.) 47, 21, 37, 36; D (15-21 in.) 18, 8, 33, 32; E (21-27 in.) 2, 1, 5, 5. Shrub stems/acre 5558; ground cover 25%; canopy cover 85%, average canopy height 57 ft (range 51-68). **Edge:** Similar habitat on all sides. **Topography:** Steep SW-facing hillside. **Elevation:** 2500 ft. **Weather:** Cold and dry. **Coverage:** June 5-10; dawn-0740. Total party-hours: 13. **Census:** E. Wood Pewee, 2.5; Red-eyed Vireo, 2.5; Wood Thrush, 2; Great Crested Flycatcher, 1; Tufted Titmouse, 1; Blue-gray Gnatcatcher, 1; Worm-eating Warbler, 1; Scarlet Tanager, 1; White-breasted Nuthatch, 0.5; Rose-breasted Grosbeak, 0.5; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Downy Woodpecker, +; Blue Jay, +; Com. Crow, +; Brown-headed Cowbird, +. **Total:** 16 species; 13 territorial males (214/km<sup>2</sup>, 87/100 acres). **Visitors:** Com. Flicker, E. Phoebe, Acadian Flycatcher, Carolina Wren, Gray Catbird, Am. Robin, Pine Warbler, Indigo Bunting, Am. Goldfinch and Rufous-sided Towhee. **Remarks:** This plot lies in the "rain shadow" of the Appalachian Mountains and has an average annual precipitation of only 32-36 in. Even so, the census was taken when the rainfall was far below normal and growing corn was killed in the fields by cold weather. The lack of moisture was reflected by scarcity of ground cover in the woodlots, apparently adversely affecting the number of ground-nesting birds. The sample of woodland reported is, we feel, indicative of much of the upland area of the county. — *JEAN ANDERSON*, *E R CHANDLER*, *RICHARD DIENER*, *HOWARD HEIMERDINGER*, *ROBERT HOSTOTTE*, *EDWARD ILGENFRITZ*, *DAVID JONES*, *ELIZABETH MCINTYRE*, *DONALD NEUMANICH*, *JAMES SIRCH*, *LOUIS STURM*, *JOSEPHINE WOOD* and *GLEN PHILLIPS* (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

**55. CENTRAL HARDWOOD FOREST WITH SCATTERED PINE.** — **Location:** Washington, D C, Rock Creek Park, lying S of Military Road and W of Rock Creek. **Continuity:** Established 1948; 18 intermittent years. **Size:** Until 1963, 80 acres; since 1963, 26 3 ha = 65 acres. **Description of Plot:** See AFN 2:153-154 (1948). **Coverage:** April 16, 23; May 1, 4, 7, 8, 12, 14-15, 17, 20-22, 24, 29; June 3, 10-12, 16, 19, 24; July 3. Total 27 trips, 23 at 0600-1100 hours and 4 at 1445-1900, EST Total man-hours: 81.8. **Weather:** In general, clear and calm; average temperature 65°F. **Census:** Red-eyed Vireo, 16 (61, 25); Wood Thrush, 8 (30, 12); Ovenbird, 8, Red-bellied Woodpecker, 7 (27, 11); Tufted Titmouse, 6 (23, 9); Scarlet Tanager, 5 (19, 8); Blue Jay, 4 (15, 6), Cardinal, 4; Downy Woodpecker, 3 (11, 5); Carolina Chickadee, 3; Veery, 3; Com. Flicker, 2; E. Wood Pewee, 2, Pileated Woodpecker, 1; Acadian Flycatcher, 1; Com Crow, 1; White-breasted Nuthatch, 1; Starling, 1; Com Grackle, 1; Gray Catbird, +; Brown-headed Cowbird, +. **Total:** 21 species; 77 territorial males (293/km<sup>2</sup>, 118/100 acres). **Remarks:** Nests found: Tufted Titmouse, 2, Downy Woodpecker, Blue Jay, Wood Thrush, Starling, Com. Grackle, 1 each. The present total of 77 territories continues to reflect the radical loss of summer residents which is taking place in this area. Comparison of this census with others taken in the Washington, D.C. area has shown this to be a general trend in Rock Creek and other locations, apparently related to loss of adjacent or nearby similar habitat and greater human use of the area. In the present census, the total of 118 territories per 100 acres is the lowest to date and is far below the average of 221 territories per 100 acres from 1947 to 1958, before the decrease became pronounced. In addition the decrease in this area has probably been augmented by predation by Blue Jays that entered the tract as nesters after the loss of adjacent similar habitat — *JOAN H. CRISWELL* (compiler), *R. FORD*, *J. LYNCH*, *M. M. TERRY*, *R. D. VINE*, *R. WHITCOMB*, Audubon Naturalist Society, 8940 Jones Mill Road, Washington, D.C. 20015.

**56. MIXED OAK - PINE AND SWAMP FOREST.** — **Location:** North Carolina; Carteret Co., Theodore Roosevelt Natural Area on Bogue Bank; 34°41'45"N, 76°49'45"W, Mansfield Quadrangle, USGS. **Continuity:** Established 1974; 2 intermittent years (formerly Mixed Maritime and Swamp Forest). **Size:** 10.1 ha = 25 acres. **Description of Area:** See AB 28:1004-1005 (1974) **Weather:** Temperatures normal, precipitation below normal. **Coverage:** May 12, 15, 17-18, 28, 31; June 1-2, 4, 15; 0630-0900, EDT. Total man-hours: 34. **Census:** Cardinal, 8 (79, 32); Prothonotary Warbler, 5 (49, 20), White-eyed Vireo, 4 (40, 16); Yellow-billed Cuckoo, 2, Great Crested Flycatcher, 2; Carolina Wren, 1.5; Black-throated Green Warbler, 1.5; Blue Jay, 1; Carolina Chickadee, 1; Red-shouldered Hawk, +; Chuck-will's-widow, +. **Total:** 11 species; 26 territorial males (257/km<sup>2</sup>, 104/100 acres). **Remarks:** The number of territorial male Carolina Wrens was much less than in 1974 (9.5) — *JOHN O. FUSSELL III*, P.O. Box 520, Morehead City, N.C. 28557.

**57. TAMARACK BOG AND HARDWOOD.** — **Location:** Michigan; Berrien Co., 1 mi SW of Stevensville in the Grand Mere State Park, 0.5 mi N of Willow Drive on Wishart Road, 41°59'30"N, 86°33'W, Bridgman Quadrangle. **Continuity:** Established 1976. **Size:** 8.5 ha =

21 acres. **Description of Plot:** See AB 30.1049 (1976). **Weather:** May was hot and dry; June, cool and dry. **Coverage:** May 28-29; June 7-12; 0630-0900. Total man-hours: 9. **Census:** Veery, 3 (35, 14); Cardinal, 2.5; Great Crested Flycatcher, 2; Red-eyed Vireo, 2; Canada Warbler, 2; Red-headed Woodpecker, 1; E. Wood Pewee, 1; Blue Jay, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Am. Robin, 1; Downy Woodpecker, 0.5; Black-capped Chickadee, 0.5; Scarlet Tanager, 0.5; Mourning Dove, +; Com. Flicker, +; Cedar Waxwing, +. **Total:** 18 species; 20 territorial males ( $235/\text{km}^2$ , 95/100 acres). **Remarks:** Gained four new species; lost two. — *ALBERT MORSE, JAMES MULLINS (compiler), 2558 Locust Lane, Stevensville, Mich. 49127.*

**58. MIXED PINE-HARDWOOD FOREST.** — **Location:** Texas; Angelina Co., Angelina College Property, 1.6 mi S of intersection of Loop 287 and US 59;  $31^{\circ}17'34''\text{N}$ ,  $94^{\circ}44'1''\text{W}$ , Lufkin Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 6.32 ha = 15.6 acres. **Description of Plot:** See AB 28:1016 (1974). **Weather:** Clear to partly cloudy skies; precipitation was negligible. Temperatures 67-73°F. **Coverage:** May 16-20, 24-26; 0800-0900, with an average of 60 minutes per trip. Total man-hours: 8. **Census:** Cardinal, 8 (127, 51); White-eyed Vireo, 5 (79, 32); Red-eyed Vireo, 3 (48, 19); Acadian Flycatcher, 2; Carolina Chickadee, 2; Tufted Titmouse, 2; Swainson's Warbler, 2; Hooded Warbler, 2; Green Heron, 1; Yellow-billed Cuckoo, 1; Carolina Wren, 1; Kentucky Warbler, 1; Brown-headed Cowbird, +. **Total:** 13 species; 30 territorial males or females ( $475/\text{km}^2$ , 192/100 acres). **Remarks:** No nests were found. Population density was at a four-year low. — *LOUIS DEBETAZ (compiler), Science Division, Angelina College, Lufkin, Tex. 75901.*

**59. UPLAND SCOTCH PINE PLANTATION.** — **Location:** New York; Allegany Co., 2 mi WSW of Alfred, bordering on the W side of Lake Road, adjacent to the evergreen plantings on the E side of Foster Lake;  $42^{\circ}7'30''\text{N}$ ,  $77^{\circ}45'\text{W}$ , Andover Quadrangle, USGS. **Continuity:** Established 1969; 9 consecutive years. **Size:** Approximately 9.3 ha = 23 acres. **Description of Plot:** See AFN 23:743-744 (1969). No Christmas trees were harvested this year. Selective cutting of second-growth pine increased the open spaces in the large sections of the plantation where the pines are much too tall for use as Christmas trees. **Weather:** Alfred Cooperative Weather Station data indicates that precipitation during May, June and July was near normal. Average mean daily temperatures during June and July were within normal range but May was a full 10°F warmer than the 57-year average. **Coverage:** April 10; May 6, 14, 24, 30-31; June 4, 10, 16, 21; July 11, 15, 22, 29; August 3; 0845-1530, EDT, plus one trip at dusk. Total man-hours: 22. **Census:** Song Sparrow, 25 (269, 109); Chipping Sparrow, 20 (215, 87); Com. Yellowthroat, 9 (97, 39); Field Sparrow, 9; Rufous-sided Towhee, 5 (54, 22); Am. Robin, 4 (43, 17); Purple Finch, 4; Am. Woodcock, 3 (32, 13); Nashville Warbler, 3; Cedar Waxwing, 2; Magnolia Warbler, 2; Yellow-rumped Warbler, 2; Brown-headed Cowbird (females), 2; Black-billed Cuckoo, 1; Alder Flycatcher, 1; Tree Swallow, 1; Gray Catbird, 1; Brown Thrasher, 1; Prairie Warbler, 1; Indigo Bunting, 1; E. Kingbird, +; Bobolink, +; Red-winged Blackbird, +. **Total:** 23 spe-

cies, 97 territorial males ( $1042/\text{km}^2$ , 422/100 acres). **Remarks:** Nests found: Chipping Sparrow, 8; Song Sparrow, 6; Am. Robin, 3; Field Sparrow, 3; Purple Finch, 2; Tree Sparrow, 1; Prairie Warbler, 1; Com. Yellowthroat, 1. Two Song Sparrow nests were parasitized by cowbirds. Nashville Warbler and Indigo Bunting were new breeding species this year. Appreciation is extended to Eddy Foster for permission to conduct the study; to Clarence Klingensmith for assistance; and to Gaylord Rough for weather data. — *ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N.Y. 14803.*

**60. YOUNG SPRUCE FOREST.** — **Location:** Maine, Hancock Co., Deer Isle; 0.35 mi N of Stinson Point,  $44^{\circ}10'\text{N}$ ,  $68^{\circ}43'\text{W}$ , Deer Isle Quadrangle, USGS. **Continuity:** New. **Size:** 5.06 ha = 12.5 acres (from survey map). **Description of Plot:** Area was cut and partially burned prior to 1958. The rejuvenating forest provides a patchy habitat with dense stands of conifers interspersed with open areas of hardwoods, shrubs, and herbaceous ground cover. Scattered White Birch and spruce snags 6-14 m high provide perches for singing and feeding. There are a few granite outcroppings: a small gravel road and old woods roads cross the W and S parts of the plot. Dominant canopy trees are Red Spruce (*Picea rubens*), White Spruce (*P. glauca*), Balsam fir (*Abies balsamea*), White Birch (*Betula papyrifera*), Yellow Birch (*B. lutea*), and Red Maple (*Acer rubrum*). The largest conifers are 4.5 m in height and 5-10 cm dbh; the largest hardwoods are 10 m high and 15 cm dbh. Most prevalent shrubs are Pin Cherry (*Prunus pensylvanica*), Blackberry (*Rubus* sp.), Raspberry (*Rubus strigosus*) and Meadowweet (*Spiraea* spp.). Ground cover consists of boreal forbs such as Bunchberry (*Cornus canadensis*) and Cranberry (*Vaccinium macrocarpon*). Grasses, ferns — predominantly Hayscented (*Dennstaedtia punctilobula*), mosses (*Polytrichum* spp. and *Sphagnum* spp.) and lichens (*Cladonia* spp.). **Edge:** Bordered on all sides by patches of similar habitat and mature forest. Bold rocky shore of Penobscot Bay lies 300 ft W of plot. **Topography:** Slopes NW. **Elevation:** 20-120 ft. **Weather:** June very wet, July dry. Temperature range 54-80°F. Winds up to 25 mph. **Coverage:** June 20-24, 28-30; July 1-8; 0430-2000 hours, usually 0630-1030. Total man-hours: 20. **Census:** Magnolia Warbler, 7 (56, 23); Am. Redstart, 6 (48, 19); Black-throated Green Warbler, 4 (32, 13); White-throated Sparrow, 4; Black-and-white Warbler, 2.5; Swainson's Thrush, 2; Am. Goldfinch, 2; Dark-eyed Junco, 2; Winter Wren, 1.5; Cedar Waxwing, 1.5; Com. Yellowthroat, 1.5; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Olive-sided Flycatcher, 1; Red-breasted Nuthatch, 1; Gray Catbird, 1; Am. Robin, 1; Nashville Warbler, 1; Purple Finch, 1; Downy Woodpecker, 0.5; E. Wood Pewee, +; Starling, +. **Total:** 23 species; 43.5 territorial males ( $860/\text{km}^2$ , 348/100 acres). **Visitors:** Com. Crow, Com. Raven, Yellow-rumped Warbler. **Remarks:** Cedar Waxwing unusually abundant. Species observed after census period as visitors or transients included Tree Swallow, Barn Swallow, Hermit Thrush, Song Sparrow — *KENNETH L. and THOMAS L. CROWELL, Sunset, Me. 04683.*

**61. MIXED FOREST, OLD FIELD AND HOME-SITE.** — **Location:** Vermont; Windsor Co., 1.5 mi S of Woodstock on Church Hill;  $43^{\circ}36'\text{N}$ ,  $72^{\circ}31'\text{W}$ , Woodstock Quadrangle, USGS. **Continuity:** Established 1973,

5 consecutive years. **Size:** 10.9 ha = 27 acres. **Description of Plot:** See *AB* 27:982 (1973). **1976. Weather:** Cool and wet, 36-53°. **Coverage:** May 30-31; June 1-2, 4-5, 7, 11, 15, 20; August 7, 12, 18; 0500-0830 or 1800-2000 hours. Total man-hours: 22. **Census:** Am. Robin, 13 (119, 48); Song Sparrow, 12 (110, 44); Black-capped Chickadee, 11 (101, 41); Red-eyed Vireo, 9 (82, 33); Ovenbird, 9; Wood Thrush, 8 (73, 30); Veery, 7 (64, 26); Com. Yellowthroat, 7; Least Flycatcher, 5 (46, 19); N. Oriole, 5; Tree Swallow, 4 (37, 15); Blue Jay, 4; Cedar Waxwing, 4; Rose-breasted Grosbeak, 4; Ruby-throated Hummingbird, 3 (27, 11); Am. Goldfinch, 3; Yellow-bellied Sapsucker, 2; Hairy Woodpecker, 2; Downy Woodpecker, 2; E Kingbird, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Hermit Thrush, 2; Warbling Vireo, 2; Black-and-white Warbler, 2; Red-winged Blackbird, 2; Com. Grackle, 2; Scarlet Tanager, 2; Ruffed Grouse, 1; Mourning Dove, 1; Com. Flicker, 1; E. Phoebe, 1; E. Wood Pewee, 1; Barn Swallow, 1; Com. Crow, 1; House Wren, 1; Gray Catbird, 1; Starling, 1; Solitary Vireo, 1; Nashville Warbler, 1; Yellow Warbler, 1; Yellow-rumped Warbler, 1; Chestnut-sided Warbler, 1; Canada Warbler, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Cardinal, 1; Indigo Bunting, 1; Chipping Sparrow, 1. **Total:** 49 species; 153 territorial males or females (1400/km<sup>2</sup>, 567/100 acres). **Remarks:** Birds were generally down this year. Most noticeable was the decrease in warblers and thrushes (except robins). Bluebirds were discouraged by Tree Swallows and the phoebes apparently failed to lay any eggs in four nesting attempts. Twenty-three nests were found: Tree Swallow, 4 (all in boxes); Am. Robin, 4; Song Sparrow, 4; Least Flycatcher, 2; N. Oriole, 2; E. Kingbird, 1; E. Phoebe, 1; House Wren, 1 (in box); Gray Catbird, 1; Hermit Thrush, 1; Cedar Waxwing, 1; Com. Yellowthroat, 1.

**1977. Weather:** Cool, sunny and windy 40-56°. **Coverage:** May 26-28; June 3, 6, 8, 12, 17, 19-20, 26-27; August 10; between 0530-0830 or 1730-1930 hours. Total man-hours 22. **Census:** Am. Robin, 11 (100, 41); Red-eyed Vireo, 10 (92, 37); Ovenbird, 9 (82, 33); Black-capped Chickadee, 8 (73, 30); Wood Thrush, 8; Song Sparrow, 8; Veery, 7 (64, 26); Least Flycatcher, 5 (46, 19); Com. Yellowthroat, 5; Tree Swallow, 3 (27, 11); Hermit Thrush, 3; Cedar Waxwing, 3; Red-winged Blackbird, 3; Rose-breasted Grosbeak, 3; Hairy Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; Gray Catbird, 2; Warbling Vireo, 2; Black-and-white Warbler, 2; N. Oriole, 2; Chipping Sparrow, 2; Ruby-throated Hummingbird, 1.5; Ruffed Grouse, 1; Com. Flicker, 1; Yellow-bellied Sapsucker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Blue Jay, 1; White-breasted Nuthatch, 1; House Wren, 1; Solitary Vireo, 1; Yellow Warbler, 1; Black-throated Green Warbler, 1; Canada Warbler, 1; Am. Redstart, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Cardinal, 1; Indigo Bunting, 1; Am. Goldfinch, 1; White-throated Sparrow, 1; Barn Swallow, 0.5. **Total:** 44 species; 124 territorial males or females (1135/km<sup>2</sup>, 459/100 acres). **Remarks:** Total number of territorial males was down again this year, from 153 in 1976 to 124. Perhaps increased wood-gathering activity has had a slightly adverse effect, reducing some cover. The number of species was down also, from 49 in 1976 to 44. Most notable is the absence, for the first time since starting the census in 1973, of territorial Yellow-rumped and Chestnut-sided Warblers. 22 nests were found: Am. Robin, 4; Tree Swallow,

low, 3 (all in boxes); Song Sparrow, 2; Yellow-bellied Sapsucker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Blue Jay, 1; House Wren, 1 (in box); Gray Catbird, 1; Hermit Thrush, 1; Veery, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Red-winged Blackbird, 1; N. Oriole, 1; Chipping Sparrow, 1. — *JULIA NICHOLSON, Vermont Institute of Natural Science, Woodstock, Vt. 05091.*

## 62. ABANDONED NURSERY WITH HEDGEROWS. — Location: Connecticut; New London Co., Town of Waterford; 0.15 mi S intersection of State Rt 156 and Power Station Rd., 41°19'10"N, 72°10'W, Niantic Quadrangle, USGS. Continuity: New. Size: 14.2 ha = 35.08 acres (planimetered, about 2150 x 700 ft).

**Description of Plot:** This area is cut into sections by several stone walls interspersed and bordered with shrubs and trees forming hedgerows. Principal shrubs along hedgerows are: Rose (*Rosa* sp.), N. Arrowwood (*Viburnum recognitum*), Poison Ivy (*Rhus radicans*), and Highbush Blueberry (*Vaccinium corymbosum*). Tree layer when present is dominated by Red Maple (*Acer rubrum*), Black Cherry (*Prunus serotina*), Sour Gum (*Nyssa sylvatica*), and Shad-bush (*Amelanchier* sp.). Tree height averages 15 ft. Although most of the ornamental plants have been removed, planted rows of Mountain Ash (*Sorbus* sp.), Cherry (*Prunus* sp.), Atlantic White Cedar (*Chamaecyparis thyoides*), Flowering Dogwood (*Cornus florida*), Yew (*Taxus* sp.), Azalea (*Rhododendron* sp.), *Pieris floribunda* and *P. japonica* remain. Between these plantings, old field vegetation has invaded. The E portion is dominated by herbaceous perennials, especially graminoids, Goldenrod (*Solidago rugosa*), and Ragweed (*Ambrosia artemisiifolia*). Scattered among this vegetation are a number of invading shrubs dominated by rose and remaining rows of ornamental species. Moving W, shrubs become more important. Dominant species are N Arrowwood and rose with Steeplebush (*Spirea tomentosa*), Winged Sumac (*Rhus copallina*) and N. Bayberry (*Myrica pensylvanica*) present as associated species. The E edge consists of an almost continuous cover of shrubs. Several wetlands occur including a shallow pond and a small, slow moving stream. Wet meadow vegetation includes Skunk Cabbage (*Symplocarpus foetidus*), *Iris versicolor*, Tussock Sedge (*Carex stricta*), rushes and cat-tails (*Typha latifolia*). **Edge:** A cleared, fenced materials storage area and deciduous trees border the S edge. The E edge is delineated by a paved road, on the other side of which are abandoned fields. Fields and thickets border the W edge. Fields used by horses border the N edge. **Topography:** Relatively flat; ditch parallels the road along the E edge. A slight rise occurs in the NW which drops steeply to the stream. **Elevation:** 70 ft. **Weather:** Normal spring, very hot and dry July and early August. **Coverage:** April 17; May 6, 29; June 1, 3, 14; August 10, mostly 0530-0830. Total man-hours: 25. **Census:** Red-winged Blackbird, 21 (148, 60); Yellow Warbler, 15 (106, 43); Com. Yellowthroat, 13.5 (95, 38); Song Sparrow, 10 (70, 29); Gray Catbird, 8 (56, 23); Am. Goldfinch, 8; Am. Robin, 5 (35, 14); Brown Thrasher, 4 (28, 11); Willow Flycatcher, 3 (21, 9); Mourning Dove, 2; E. Kingbird, 2; Blue Jay, 2; White-eyed Vireo, 2; Chestnut-sided Warbler, 2; Brown-headed Cowbird, 2 (females); Field Sparrow, 2; Bobwhite, 1; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Com. Flicker, 1; House Wren, 1; Starling, 1; House Finch, 1; Cardinal, 0.5; Rufous-sided Towhee, 0.5; E. Meadowlark, +

**Total:** 27 species, 110.5 males or females ( $778/\text{km}^2$ ,  $315/100$  acres). **Visitors:** Mallard, Black Duck, Am. Kestrel, Barn and Tree Swallows, Com. Crow, Mockingbird, Cedar Waxwing, Com. Grackle. **Remarks:** The plot is a part of a large heterogeneous tract containing two nuclear electrical generating plants bordering Long Island Sound. Owing to security regulations, the plot incurs a minimum of human activity. Special thanks to Allison MacMillan, Joan Tabachnick, and Lauren Tucker for habitat description. Cooperation of Northeast Utilities in granting access is gratefully acknowledged. — **GRACE BISSELL, ANDREW DASINGER, BRUCE DASINGER (compiler), 12 Stone Cliffe Drive, Niantic, Conn. 06357.**

**63. MIXED UPLAND HABITAT AND SWAMP.** — **Location:** Connecticut; Fairfield Co., Newtown, intersection of Route 34 and Zoar Road;  $41^\circ 24' \text{N}$ ,  $73^\circ 14' \text{W}$ , Southbury Quadrangle, USGS. **Continuity:** Established 1968; 10 consecutive years. **Size:** 14.17 ha = 35 acres. **Description of Plot:** See AFN 22:714-715 (1968). **Coverage:** May 26-30; June 4-5, 12, 15-17, 19-20, 23-24, 26; July 2-4, 14; 0510-1215 or 1355-1630, EDT. Total man-hours: 39. **Census:** Ovenbird, 16 (113, 46); Wood Thrush, 15 (106, 43); Rufous-sided Towhee, 12 (85, 34); Veery, 8 (56, 23); Red-eyed Vireo, 7 (49, 20); Scarlet Tanager, 7; Rose-breasted Grosbeak, 7; Am. Robin, 6 (42, 17); Com. Flicker, 5 (35, 14); Blue Jay, 5; Tufted Titmouse, 5; E. Wood Pewee, 3 (21, 9); White-breasted Nuthatch, 3; Black-and-white Warbler, 3; Com. Yellowthroat, 3; N. Oriole, 3; Cardinal, 3; Ruffed Grouse, 2; Black-capped Chickadee, 2; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Phoebe, 1; House Wren, 1; Gray Catbird, 1; Brown Thrasher, 1; Yellow-throated Vireo, 1; Indigo Bunting, 1; Field Sparrow, 1; Song Sparrow, 1; Great Crested Flycatcher, 0.5. **Total:** 30 species, 125.5 territorial males or females ( $886/\text{km}^2$ ,  $359/100$  acres). **Visitors:** Chimney Swift, Starling, Blue-winged Warbler, Red-winged Blackbird. **Remarks:** In the span 1973-77, Wood Thrush numbered 13, 8, 14, 7.5, 15, Red-eyed Vireo, 13, 11, 10, 8, 7; Rufous-sided Towhee, 12, 14, 10, 8.5, 12. — **LAURA H. MOSELEY, 1083 Hillsboro Beach, Pompano Beach, Fla. 33062.**

**64. UPLAND BRUSHY PASTURE.** — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield;  $41^\circ 42' 50'' \text{N}$ ,  $73^\circ 13' 28'' \text{W}$ , Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 11 intermittent years. **Size:** 8.5 ha = 21 acres. **Description of Plot:** See AFN 19:609-610 (1965). **Coverage:** June 3-6; 14-15; 0630-2045. Total man-hours: 16. **Census:** Com. Yellowthroat, 13 (153, 62); Gray Catbird, 12 (141, 57); Rufous-sided Towhee, 11 (129, 52); Blue-winged Warbler, 7 (82, 33); Song Sparrow, 6 (71, 29); Am. Woodcock, 4 (47, 19); Brown Thrasher, 4; Veery, 4; Cedar Waxwing, 4; Am. Goldfinch, 4; Field Sparrow, 4; Blue Jay, 3 (35, 14); Black-and-white Warbler, 2.5; Am. Redstart, 2.5; Rose-breasted Grosbeak, 2.5; Ruffed Grouse, 2, Red-eyed Vireo, 2; Nashville Warbler, 2; Yellow Warbler, 2; N. Oriole, 2; Black-capped Chickadee, 1.5; Am. Robin, 1.5; Chestnut-sided Warbler, 1.5; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Wood Thrush, 1; Brewster's Warbler, 1; Prairie Warbler, 1; Ovenbird, 1; Brown-headed Cowbird, 1; Cardinal, 1. **Total:** 31 species; 106 territorial males ( $1,247/\text{km}^2$ ,  $505/100$  acres). **Remarks:** Habitat continues to undergo rapid change from open,

grazed pasture to hardwood forest. After a rise in density by 12.5 territorial males in 1976, density rose this year by 26.5 males, a phenomenal 33% of the 1976 total. The main increases over 1976 are Com. Yellowthroat (from 6 to 13, now at the highest density recorded for any species on this plot), Rufous-sided Towhee (from 7 to 11), and Veery (from 1.5 to 4). Special thanks to Jim Cavanaugh for his help. — **ANDREW MAGEE, 34 Hobson St, Springfield, Mass. 01109.**

**65. ABANDONED PASTURE-YOUNG MIXED FOREST.** — **Location:** New York; St. Lawrence Co., 0.25 mi E of Howardville Rd., 0.25 mi SW of Rte 68;  $44^\circ 33' \text{N}$ ,  $75^\circ 03' \text{W}$ , Pierrepont Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 3.44 ha = 8.5 acres. **Description of Plot:** Last grazed in 1967, but larger trees (40cm dbh, 15m high) date well before that. Small patches of conifer seedlings, White Pine (*Pinus strobus*), Scotch Pine (*P. sylvestris*), and White Spruce (*Picea glauca*), were planted in 1969-71. Dominant canopy species are Red Maple (*Acer rubrum*), Gray Birch (*Betula populifolia*), Hophornbeam (*Ostrya virginiana*), Quaking Aspen (*Populus tremuloides*), Apple (*Pyrus malus*), Am. Elm (*Ulmus americana*). Significant understory species are E. Hemlock (*Tsuga canadensis*), Meadowsweet and Hardhack (*Spiraea* spp.), Com. Blackberry (*Rubus allegheniensis*), and hawthorn (*Crataegus* spp.). Ground cover consists of a mixture of common grasses and meadow and woodland forbs such as Aster spp., goldenrod (*Solidago* spp.), Partridge Berry (*Mitchella repens*) and Hairy-capped mosses (*Polytrichum* spp.). **Edge:** Similar but wetter habitat on all sides. Small potholes have been constructed just beyond W, S, and NE boundaries. Mature stand of hemlock lies 100 m W of plot. An intermittent stream runs close to the NE boundary. **Topography:** Irregular, a low rocky ridge runs NW-SE. **Elevation:** 620-650 ft **Weather:** 1976 wet; 1977 dry. **Coverage:** 1976. May 30, June 1-2, 6; 0500-1600. Total man-hours: 5. **Census:** Gray Catbird, 2; Nashville Warbler, 2; Chestnut-sided Warbler, 2; Rufous-sided Towhee, 2; Field Sparrow, 2, Song Sparrow, 2; Veery, 1; Black-and-white Warbler, 1; Golden-winged Warbler, 1; Yellow-rumped Warbler, 1, Com. Yellowthroat, 1; Brown-headed Cowbird, 1, White-throated Sparrow, 1; E. Kingbird, +; Alder Flycatcher, +; Am. Robin, +; Yellow Warbler, +; N. Oriole, +; Rose-breasted Grosbeak, +; Am. Goldfinch, + **Total:** 20 species; 19 territorial males ( $552/\text{km}^2$ ,  $224/100$  acres) **Coverage:** 1977. May 21-22; June 5, 10-11, 16, 0430-1945. Total man-hours: 5. **Census:** Black-and-white Warbler, 2; Rufous-sided Towhee, 2; White-throated Sparrow, 2; Song Sparrow, 2; Yellow Warbler, 1.5, Field Sparrow, 1.5; Ruffed Grouse, 1; Alder Flycatcher, 1, Black-capped Chickadee, 1; Gray Catbird, 1, Am. Robin, 1; Wood Thrush, 1; Veery, 1; Chestnut-sided Warbler, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Black-billed Cuckoo, +; E. Kingbird, +; Blue Jay, +, Red-winged Blackbird, +; Brown-headed Cowbird, +, Am. Goldfinch, +. **Total:** 22 species; 21 territorial males ( $610/\text{km}^2$ ,  $247/100$  acres). **Visitors:** Am. Woodcock, Com. Snipe, Great Horned Owl, Com. Crow, Yellow-rumped Warbler, N. Oriole. — **KENNETH L CROWELL, Dept. of Biology, St. Lawrence Univ., Canton, N.Y. 13617.**

**66. MIXED UPLAND HABITAT.** — **Location:** Pennsylvania; Montgomery Co.; woods of St. Charles Seminary, 0.4 mi SW of Philadelphia city limits on US

30; 40°0'N, 75°15'W, Lansdowne Quadrangle, USGS. **Continuity:** New. **Size:** 7.77 ha = 19.2 acres (nearly triangular, measured). **Description of Plot:** Part of a hard-wood forest with stream edge that was extensively cleared and used as a commercial tree nursery. Nursery was abandoned four years ago, leaving approx. 50% open meadows and thickets interspersed with approximately 50% woodlands. The dominant canopy trees are willow and oak while many smaller ornamental trees remain. The shrub layer consists mostly of Black Raspberry (*Rubus occidentalis*) thickets and small saplings of the canopy trees. The ground cover is primarily Skunk Cabbage (*Symplocarpus foetidus*), Lesser Celandine (*Ranunculus ficaria*) and May Apple (*Podophyllum peltatum*) in the wet woodlands adjacent to the stream and Poison Ivy (*Rhus radicans*), Thicket Creeper (*Parthenocissus inserta*) and Com. Ragweed (*Ambrosia artemisiifolia*) in higher elevation. A quantitative survey of vegetation gave



**Census 66. Mixed Upland Habitat. Photo/David M. Wright.**

the following results: trees, 3 in. diameter and over, based on six 0.1-acre circular samples, 219/acre; total basal area 121.4 ft<sup>2</sup>/acre. Species comprising 91% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance (%), and frequency in that sequence): Sugar Maple (*Acer saccharum*), 27, 13, 3, 50; ornamental Red Cedar (*Juniperus virginiana*), 27, 12, 2, 26; Weeping Willow (*Salix babylonica*), 22, 10, 43, 17; dead trees, 21, 10, 7, 67; White Oak (*Quercus alba*), 16, 7, 11, 33; E. Hemlock (*Tsuga canadensis*), 14, 7, 2, 17; Chinese Elm (*Ulmus parvifolia*), 13, 6, 3, 17; Red Oak (*Q. rubra*), 11, 5, 3, 50; Tulip-tree (*Liriodendron tulipifera*), 10, 4, 7, 17; ornamental Mimosa, 10, 4, 1, 17; European Black Alder (*Alnus glutinosa*), 8, 4, 1, 17; Red Mulberry (*Morus rubra*), 6, 3, 1, 33; White Ash (*Fraxinus americana*), 5, 2, 4, 50; Black Cherry (*Prunus serotina*), 5, 2, 1, 17; Black Locust (*Robinia pseudo-acacia*), 5, 2, 2, 17. Trees by diameter size class (figures after each class give the number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (3-6 in.) 128, 56, 12.3, 10; B (6-9 in.) 32, 15, 9.6, 8; C (9-15 in.) 43, 20, 34.6, 28; D (15-21 in.) 14, 6, 23.0, 19; E (21-27 in.) 3, 1, 9.9, 8; F (27-33 in.) 1, 1, 7.8, 6; G (33-40 in.) 1, 1, 11.4, 9; H (> 40 in.) 2, 1, 12.8, 11. Shrub stems/acre 13,446; ground cover 82.5%; canopy cover 51%; average canopy height 43 ft (range 15-65). **Edge:** Bordered on E by mature oak-beech forest, partially disturbed by hiking trails and diversion

of stream to form nature pond; on all other sides by suburban residential areas. **Topography:** A gradual east-facing slope, extending from 210 ft on the E bordering stream and ascending to 260 ft on W border. **Weather:** Fair and warm. **Coverage:** May 8, 13, 15, 19 22, 29; June 12, 16, 18, 26; July 2-3, 10, 16; 14 trips, mostly 0530-1100, occasionally 1900-2000. Total man hours: 26. **Census:** Am. Robin, 9 (116, 47); Cardinal, 9, Gray Catbird, 8.5 (109, 44); Com. Yellowthroat, 7 (90, 36); Song Sparrow, 6 (77, 31); Am. Goldfinch, 5 (64, 26); House Wren, 4 (51, 21); Ring-necked Pheasant, 3 (39, 16); Wood Thrush, 3; Red-eyed Vireo, 3; La. Water-thrush, 3; Rufous-sided Towhee, 3; Downy Woodpecker, 2; Starling, 2; Ovenbird, 2; Com. Grackle, 2; Scarlet Tanager, 2; Mourning Dove, 1.5; Com. Flicker, 1.5; Screech Owl, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Tufted Titmouse, 1; Am. Redstart, 1; Brown-headed Cowbird, 1 (female); N. Oriole 0.5; Mallard, +; Mockingbird, +; Red-winged Blackbird, +. **Total:** 30 species; 84 territorial males or females (1081/km<sup>2</sup>, 438/100 acres). **Visitors:** Rock Dove, Chimney Swift, Barn Swallow, Com. Crow, Carolina Chickadee, White-breasted Nuthatch. **Remarks:** Eight nests were located: Starling, 2; Downy Woodpecker, 1, Blue Jay, 1 with 3 nestlings; House Wren, 1; Wood Thrush, 1 with 2 thrush eggs and 1 cowbird egg; Red-eyed Vireo, 1 with 2 nestlings; Cardinal, 1 with 3 nestlings. Ring-necked Pheasant, Carolina Chickadee, House Wren, Gray Catbird, Com. Yellowthroat, Com. Grackle, Cardinal were seen feeding fledglings. My deepest thanks to Father Thomas C. Hagan for permission to use the St. Charles Seminary woods. —DAVID M. WRIGHT, 527 Rock Glen Dr., Wynnewood, Pa. 19096.

**67. MOUNTAIN TOP BOG WITH MIXED HARDWOOD AND EVERGREEN EDGE.** — **Location:** Pennsylvania; Westmoreland Co., 10 mi SSW of Ligonier, 6 mi S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; 40°0'20"N, 79°10'28"W, Bakersville Quadrangle, USGS. **Continuity:** Established 1974: 4 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See AB 28:1027 83 (1974). **Weather:** Sunny except for one rainy day; mostly warm and clear. **Coverage:** June 4-5, 7, 11-12; 0500-0930, 1200-1300 and 1700-1930. Total party-hours: 13.5. **Census:** Chipping Sparrow, 4 (66, 27); Dark-eyed Junco, 3.5 (58, 23); Com. Yellowthroat, 3 (49, 20); Indigo Bunting, 3; Rufous-sided Towhee, 3; Field Sparrow, 2.5; Cedar Waxwing, 2; Solitary Vireo, 2; Red-eyed Vireo, 2; House Wren, 1.5; Am. Robin, 1.5; Scarlet Tanager, 1.5; Song Sparrow, 1.5; Yellow-billed Cuckoo, 1; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; Hermit Thrush, 1; Gray Catbird, 0.5; Veery, 0.5; Red-shouldered Hawk, +; Com. Raven, +; Com. Crow, +; Wood Thrush, +; Golden crowned Kinglet, +; Com. Grackle, +. **Total:** 25 species, 36 territorial males (593/km<sup>2</sup>, 240/100 acres). **Visitors:** Chimney Swift, E. Wood Pewee, Barn Swallow, Blackburnian Warbler, Rose-breasted Grosbeak, Purple Finch. —R. CARRELL ABBOTT (compiler), Audubon Society of Western Pennsylvania, Pittsburgh, Pa. 15213.

**68. 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; 4 consecutive years. **Size:** 10.1 ha = 25 acres. **Description**

**of Plot:** See AB 28 1027-1028 (1974) **Weather:** Late May was hot and dry; early June was unusually cold; late June, July and August were normal in temperature, but above average in precipitation. **Coverage:** May 27; June 1, 3, 5, 9; July 1, 12, 16; August 3; 0500-0730. Total man-hours: 25. **Census:** Field Sparrow, 7 (69, 28); Indigo Bunting, 6 (59, 24); Cardinal, 4 (40, 16); Rufous-sided Towhee, 4; Red-eyed Vireo, 3.5 (35, 14); Com. Yellowthroat, 3 (30, 12); Black-capped Chickadee, 2; Ruby-throated Hummingbird, 1; Tufted Titmouse, 1; House Wren, 1; Gray Catbird, 1; Golden-winged Warbler, 1; Yellow-breasted Chat, 1; Brown-headed Cowbird, 0.5; Vesper Sparrow, 0.5; Whip-poor-will, +; Great Crested Flycatcher, +; Blue-gray Gnatcatcher, +; Cedar Waxwing, +; Prairie Warbler, +; Am. Goldfinch, +. **Total:** 21 species; 36.5 territorial males or females ( $361/\text{km}^2$ , 146/100 acres). **Remarks:** Field Sparrow (3), House Wren (1) and Cardinal (1) nests were located. Thanks to Kris Watson — *R. MICHAEL SLATER, 1323 Powers Run Rd., Pittsburgh, Pa. 15238.*

**69. OVERGROWN FIELD.** — **Location:** West Virginia, Ohio Co.; 1.5 mi E of Greggsville;  $40^\circ 5' 25''\text{N}$ ,  $80^\circ 39' 36''\text{W}$ , Wheeling Quadrangle, USGS. **Continuity:** New Size: 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are White Ash (*Fraxinus americana*) and Am. Elm (*Ulmus americana*). Most prominent in the understory are blackberry (*Rubus* sp.) and Poison Ivy (*Rhus radicans*). The ground cover is primarily Sweet Cicely (*Osmorhiza longistylis*) and grasses. A quantitative survey of the vegetation gave the following results: Trees 3-in. diameter and over, based on two circular samples, 190/acre; total basal area 35.5 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees: Black Locust, 175, 92, 93, 100; Black Oak (*Quercus velutina*), 10, 5, 6, 50, dead trees, 5, 3, 2, 50. Trees by diameter size class: A (3-6 in.) 120, 63, 12, 34; B (6-9 in.) 65, 35, 19.5, 55; C (9-15 in.) 5, 3, 4, 11. Shrub stems/acre 1850 (not a true understory, blackberries only); ground cover 63%; canopy cover 51%, average canopy height 54 ft (range 43-81). **Edge:** Bordered on all sides by similar habitat except that the slope becomes very steep (as much as 45°). **Topography:** Essentially a ridge with slopes on both sides of about 10°. **Elevation:** 2150-2282 ft. **Weather:** Warm and dry days and cool nights. A killing frost occurred in the region one night. **Coverage:** June 4-6, 8; dawn-800 or 1900-2100 Total party-hours: 5. **Census:** Indigo Bunting, 3 (49, 20), Chipping Sparrow, 3; Field Sparrow, 3; Yellow-breasted Chat, 1.5; Gray Catbird, 1; Brown Thrasher, 1; Am Robin, 1; Rufous-sided Towhee, 1; Song Sparrow, 1, Turkey Vulture, +; Am. Kestrel, +; Bobwhite, +; E Phoebe, +; Great Crested Flycatcher, +; Barn Swallow, +; Com. Crow, +; E. Bluebird, +; Blue-gray Gnatcatcher, +; Cardinal, +. **Total:** 19 species; 15.5 territorial males or females ( $255/\text{km}^2$ , 103/100 acres). **Visitors:** Least Flycatcher, E. Wood Pewee, Carolina Chickadee, Starling, Com. Grackle, Brown-headed Cowbird (1 male), Am. Goldfinch. **Remarks:** Two pairs of Chipping Sparrows and one pair of Field Sparrows were seen feeding young out of the nest. This area is very dry because it is in the rain shadow of the higher mountains to the west. It is an active pasture; cattle were seen on nearly every trip, so the ground cover is very short. No tall grass birds, such as meadowlarks, were seen. Special thanks to Glen Phillips and George Koch for locating the study area and to Anne Eddy and Bill Smith for help with the quantitative habitat description. — *GREG EDDY (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W Va 26003.*

**70. WOODED PASTURE.** — **Location:** West Virginia; Hardy Co., 3.5 mi N of the administration building, Lost River State Park, on ridge on W side of Whetzel Hollow;  $38^\circ 56' 36''\text{N}$ ,  $78^\circ 55' 21''\text{W}$ , Lost River State Park Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yds, measured longitudinally and estimated laterally). **Description of Plot:** 75% is a treeless pasture of grasses, wild flowers and blackberries. In the wooded portion of the plot Black Locust (*Robinia pseudo-acacia*) is the dominant canopy tree. No understory is present and the ground cover is primarily grasses. A quantitative survey of the vegetation on the wooded portion gave the following results: Trees 3-in. diameter and over, based on two circular samples, 190/acre; total basal area 35.5 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees: Black Locust, 175, 92, 93, 100; Black Oak (*Quercus velutina*), 10, 5, 6, 50, dead trees, 5, 3, 2, 50. Trees by diameter size class: A (3-6 in.) 120, 63, 12, 34; B (6-9 in.) 65, 35, 19.5, 55; C (9-15 in.) 5, 3, 4, 11. Shrub stems/acre 1850 (not a true understory, blackberries only); ground cover 63%; canopy cover 51%, average canopy height 54 ft (range 43-81). **Edge:** Bordered on all sides by similar habitat except that the slope becomes very steep (as much as 45°). **Topography:** Essentially a ridge with slopes on both sides of about 10°. **Elevation:** 2150-2282 ft. **Weather:** Warm and dry days and cool nights. A killing frost occurred in the region one night. **Coverage:** June 4-6, 8; dawn-800 or 1900-2100 Total party-hours: 5. **Census:** Indigo Bunting, 3 (49, 20), Chipping Sparrow, 3; Field Sparrow, 3; Yellow-breasted Chat, 1.5; Gray Catbird, 1; Brown Thrasher, 1; Am Robin, 1; Rufous-sided Towhee, 1; Song Sparrow, 1, Turkey Vulture, +; Am. Kestrel, +; Bobwhite, +; E Phoebe, +; Great Crested Flycatcher, +; Barn Swallow, +; Com. Crow, +; E. Bluebird, +; Blue-gray Gnatcatcher, +; Cardinal, +. **Total:** 19 species; 15.5 territorial males or females ( $255/\text{km}^2$ , 103/100 acres). **Visitors:** Least Flycatcher, E. Wood Pewee, Carolina Chickadee, Starling, Com. Grackle, Brown-headed Cowbird (1 male), Am. Goldfinch. **Remarks:** Two pairs of Chipping Sparrows and one pair of Field Sparrows were seen feeding young out of the nest. This area is very dry because it is in the rain shadow of the higher mountains to the west. It is an active pasture; cattle were seen on nearly every trip, so the ground cover is very short. No tall grass birds, such as meadowlarks, were seen. Special thanks to Glen Phillips and George Koch for locating the study area and to Anne Eddy and Bill Smith for help with the quantitative habitat description. — *GREG EDDY (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W Va 26003.*

**71. DISTURBED OAK-HICKORY FOREST, PINE STAND, EDGE, AND POND.** — **Location:** Ohio; Licking Co., Eden Township, Camp Falling Rock, 1.2 mi NNE of the intersection of County Road 210 and State Route 79;  $40^\circ 11' \text{N}$ ,  $82^\circ 18.5' \text{W}$ , Newark Quadrangle, USGS. **Continuity:** Established 1937; 39 intermittent years (formerly listed under five other titles). **Size:** 14.16 ha = 35 acres. **Description of Plot:** See *Bird-Lore* 39:379-380 (1937). Habitat changes: Except for a few wind-blown limbs and dead trees, no major habitat alteration took place, although the vegetation underwent considerable stress. **Weather:** During late December and throughout January severe conditions prevailed because of low temperatures and prolonged deep snow. The

record-breaking winter was followed by an early Spring. A severe frost in early May slowed vegetative processes. Completing an unusual series of weather patterns was the reduced rainfall through July, somewhat less so in August. **Coverage:** June 4, 7, 10, 22; August 11, 17. Total man-hours: 35. **Census:** Acadian Flycatcher, 7 (49, 20); Red-eyed Vireo, 7; Wood Thrush, 6 (42, 17); Scarlet Tanager, 6; Am. Robin, 5 (35, 14); House Wren, 4 (28, 11), Gray Catbird, 3 (21, 9); Cardinal, 3; Chipping Sparrow, 3; Mourning Dove, Ruby-throated Hummingbird, Downy Woodpecker, Great Crested Flycatcher, E. Phoebe, E. Wood Pewee, Yellow-throated Vireo, Cerulean Warbler, Ovenbird, Kentucky Warbler, 2 each; Ruffed Grouse, Yellow-billed Cuckoo, Red-bellied Woodpecker, Hairy Woodpecker, Blue Jay, Carolina Chickadee, Tufted Titmouse, White-breasted Nuthatch, Carolina Wren, Blue-gray Gnatcatcher, Cedar Waxwing, Warbling Vireo, Louisiana Waterthrush, Yellow-breasted Chat, N. Oriole, Brown-headed Cowbird, Rose-breasted Grosbeak, Indigo Bunting, Am. Goldfinch, Song Sparrow, 1 each. **Total:** 39 species; 84 territorial males or females ( $593/\text{km}^2$ , 240/100 acres). **Remarks:** The record-breaking temperatures and deep snows of winter probably accounted for the reduction of the Carolina Wren populations. Only 21 nests were found, counting all field work through August, compared to a previous average of about 35. I am indebted to H Granville Smith for assistance in field work. — *A. H. CLAUGUS, 228 S. Lake St., Carey, Ohio 43316.*

**72. MIXED HABITAT.** — **Location:** Ohio; Montgomery Co., Aullwood Audubon Center; 1 mi NE of Englewood;  $40^\circ 17' \text{N}$ ,  $84^\circ 95' \text{W}$ , Trotwood Quadrangle, USGS. **Continuity:** Established 1957; first published in 1976, but censused annually. **Size:** 28.3 ha = 70 acres. **Description of Plot:** See AB 31:60-61 (1977). **Edge:** Bordered on all sides by similar forest and vegetation. **Topography:** A gentle downward slope from the north woods to the wet woods. **Elevation:** 892.5 ft. **Weather:** Hot and humid. Average temperature around  $85^\circ$ . **Coverage:** May 8; June 22, 28 (2 trips); July 11, 28 (2); August 8 (2), 0600-1500. Total man-hours: 35. **Census:** Am. Goldfinch, 7.5 (26, 11); Field Sparrow, 7.5; Am. Robin, 6.5 (23, 9); Com. Grackle, 6.5; Cardinal, 6.5; Indigo Bunting, 6 (21, 9); Blue Jay, 5.5 (19, 8); Chimney Swift, 4.5 (16, 6), Carolina Chickadee, 4.5; House Sparrow, 4.5; Com. Crow, 4 (14, 6); Red-winged Blackbird, 4; House Wren, 3.5 (12, 5); Wood Thrush, 3.5; Red-eyed Vireo, 3.5; Song Sparrow, 3.5; Mourning Dove, 3 (11, 4); Great Crested Flycatcher, 3; Starling, 3; Downy Woodpecker, 2.5; Cedar Waxwing, 2.5; N. Oriole, 2.5; Com. Flicker, 2; Red-bellied Woodpecker, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Com. Yellowthroat, 2; Kentucky Warbler, 2; Scarlet Tanager, 2; Rufous-sided Towhee, 2; Yellow-billed Cuckoo, 1.5; Traill's Flycatcher, 1.5; Carolina Wren, 1.5; Mockingbird, 1.5; Gray Catbird, 1.5; Blue-gray Gnatcatcher, 1.5; White-eyed Vireo, 1.5; Ruby-throated Hummingbird, 1; Hairy Woodpecker, 1; Least Flycatcher, 1; Yellow-breasted Chat, 1; Brown Thrasher, 0.5; Am. Kestrel, +; Black-billed Cuckoo, +; Acadian Flycatcher, +; E. Bluebird, +; Warbling Vireo, +; Blue-winged Warbler, +; Yellow Warbler, +; Ovenbird, +; E. Meadowlark, +. **Total:** 52 species; 131 territorial males ( $462/\text{km}^2$ , 187/100 acres). **Visitors:** Killdeer, Turkey Vulture, Red-tailed Hawk, Bell's Vireo, E. Kingbird, Brown-headed Cowbird **Remarks:** Nests found House Sparrow, 2 White-

eyed Vireo was breeding for the first time since 1957, and Traill's Flycatcher for the first time. In 1957 there were no trails, just an old barn that would become the Aullwood Audubon Center in Dayton. The habitat was primarily meadow with thickets and 3rd growth forest. By 1967 the 3rd growth forest had probably grown to 2nd growth and the thickets to 3rd growth. The meadows became thickets and the Center naturalists cut them to make two meadows. A prairie was planted and maintained by burning. A marsh was bull-dozed and a pond was made. Pines were planted. By 1976 Aullwood was fast reaching maturity. The pond and marsh had grown up. The meadows and thickets remained the same due to cutting and pruning. The prairie has been kept by burning. The 2nd growth forest has greatly matured to a 75-ft canopy. The pines grew straight and tall. All habitats have matured. In 1977 there was little change in habitats but a lot in bird populations. Such wintering species as Bobwhite, E. Bluebird, Carolina Wren, E. Meadowlark, Cardinal, and Song Sparrow were virtually wiped out by a severe winter with temperatures 10 to  $20^\circ\text{F}$  below zero. Birds that made frequent trips to feeding stations were not affected, and some even increased. — *ROGER EBERTHART, STEVE PLEASANT and CLIFF CATHERS, 24 Grecian Ave., Trotwood, Ohio 45426*

**73. RAILROAD, LIGHTLY USED.** — **Location:** Ohio; Wyandot Co., Crawford Township, 3.5 mi section of the C.C.C. and St. Louis Railroad extending from the village of Carey, N through sections 9, 10, 3, and 2 in Wyandot County and 0.5 mi into Seneca County. Approximately  $40^\circ 57' 22'' \text{N}$ ,  $83^\circ 21' 47'' \text{W}$  at Carey,  $40^\circ 59' 58'' \text{N}$ ,  $83^\circ 19' 15'' \text{W}$  in Seneca County; Upper Sandusky Quadrangle, USGS map. **Continuity:** New. **Size:** 8.58 ha = 21.2 acres (3.5 mi x 50 ft; 5.63 km x 15.24 m) Length determined from USGS map and width of the right-of-way estimated on the horizontal. **Description of Plot:** Elevated; paralleled by ditches most of the way, vegetated by coarse herbs, shrubs, and small diameter trees. Only light traffic is maintained, mostly by the commercial or local activities of the National Lime and Stone Company. The right-of-way vegetation has not been vigorously controlled and has encroached between the ties, covering the sloping sides of the track-bed, and the ditches. Conspicuous herbs include Pigweed, Lamb's-quarters, Cinquefoil, Indian Hemp, Milkweeds, Mullein, Giant Ragweed, Sunflowers, Sneezeweed, and Goldenrods, in addition to various shrubs and trees. **Weather:** See Census No. 71. **Coverage:** Irregular. Total man-hours: 30. **Census:** The numbers in parentheses represent (1) pairs/ $\text{km}^2$ , (2) pairs/100 acres, (3) pairs per linear km, (4) pairs per linear mile. Song Sparrow, 10 (117, 47, 1.8, 2.9); Red-winged Blackbird, 6 (70, 28, 11, 1.7); Indigo Bunting, 6; Gray Catbird, 5 (58, 24, .9, 14); Am. Goldfinch, 5; Willow Flycatcher, 4 (47, 19, .7, 11); Com. Yellowthroat, 4; Cardinal, 4; Am. Robin, 3 (35, 14, .5, .9); Mourning Dove, 2; Rough-winged Swallow, 2; House Sparrow, 2; Com. Grackle, 2; Field Sparrow, 2; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; Mockingbird, 1; Brown Thrasher, 1; Yellow Warbler, 1; Brown-headed Cowbird, 1. **Total:** 21 species; 64 pairs ( $746/\text{km}^2$ , 302/100 acres, 11.4/km, 18.3 pairs/mi). **Remarks:** The absence of the Carolina Wren, and probably for the Bobwhite also, might be attributed to the very cold January with deep snow cover. The absence of E. Kingbird, Cedar Waxwing, and Yellow-breasted Chat is not so obvious. Somewhat of a surprise were the four pairs of Willow Fly-

catchers, which apparently found small units of brush in the moist depressions adjacent to the railroad suitable habitat for nesting. There has been some concern that this species might decrease to an endangered status if wetlands were continually to diminish. It is hopeful that such small units of habitat are sufficient to maintain a few pairs. No cowbird eggs were found in any nest. — *A H CLAUGUS*, 228 S. Lake St., Carey, Ohio 43316.

**74. HACKBERRY - BLUE ASH - CHESNUT OAK SAVANNAH AND OLD FIELDS.** — **Location:** Ontario; Essex Co.; Scudder, Ontario Ministry of Natural Resources Lighthouse Point Nature Reserve; 41°50'N, 82°37'W, Pelee, Dept. of National Defense, Ottawa. **Continuity:** New. **Size:** 28.3 ha = 70 acres (measured from map, scale 1:4800). **Description of Plot:** Hackberry (*Celtis occidentalis*) and Blue Ash (*Fraxinus quadrangulata*) co-dominate the canopy over most of the 40-acre savannah. Many of the ashes are large. Trees 3-in. diameter and over, based on 20 point-centered samples, 78/acre. Species comprising 90% of the total number of trees (figures after each give relative density (%), relative dominance (%), relative frequency (%), and importance value (%), in that sequence): Hackberry, 33, 65, 24, 40; Blue Ash 19, 22, 19, 20; Yellow Oak (*Quercus muehlenbergii*), 12, 4, 13, 10; Hop Hornbeam (*Ostrya virginiana*), 10, 0, 13, 8. Mean point-to-plant distance 24 ft (7.3 m). Canopy height 25-50 ft (7.6-15 m). The low tree and discontinuous tall shrub layer is comprised largely of *Cra-taeus mollis*, *C. crus-galli*, young Hackberry, and Gray Dogwood (*Cornus racemosa*). Ground cover under trees is 95%, mostly continuous, and comprised of grasses, alien weeds and some spring-blooming native herbs. Old-field vegetation consists of scattered clumps of Staghorn Sumac (*Rhus typhina*), Fragrant Sumac (*R. aromatica*), Gray and Drummond's Dogwood (*Cornus drummondii*), roses (*Rosa* sp.), mulberries (*Morus* sp.) and Wafer-ash (*Ptelea trifoliata*). Herbaceous cover consists mostly of pasture grasses, a few native grasses, and weeds such as goldenrods (*Solidago* sp.), Hoarhound (*Marrubium vulgare*), Wild Carrot (*Daucus carota*), and Yellow Sweet Clover (*Melilotus officinalis*). Young Cottonwoods (*Populus deltoides*) are invading the lower fringes along the N edge of the old fields, and Hackberries are established in small groves and hedges on the uplands. **Edge:** A farm and a semi-active stone quarry exist on the E side; Lake Henry, a dyked impoundment of Lake Erie, and its marshy flats, border the N side; farms, old-fields and a township road extend along the E and S edges. **Topography:** Flat. **Elevation:** 575 ft (175 m). **Weather:** Cool, mostly breezy and clear. **Coverage:** June 8-14 Total man-hours: 16.8. **Census:** Red-winged Blackbird, 10 (35, 14); Indigo Bunting, 4 (14, 6); Mourning Dove, 3 (11, 4); Am. Goldfinch, 2.5; Ring-necked Pheasant, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Am Robin, 2; Starling, 2; Yellow Warbler, 2; Cardinal, 2; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Great Horned Owl, 1; Com. Flicker, 1; Willow Flycatcher, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Red-eyed Vireo, 1; Com. Yellowthroat, 1; Vesper Sparrow, 1; Song Sparrow, 1; E. Kingbird, +. **Total:** 24 species; 45.5 territorial males (161/km<sup>2</sup>, 65/100 acres). **Visitors:** Chimney Swift, Tree Swallow, Barn Swallow, Purple Martin, Blue Jay, Com. Crow, Cedar Waxwing, Yellow-breasted Chat, House Sparrow, Bobolink, Orchard Oriole, Com. Grackle, Brown-headed

Cowbird, E. Bluebird. **Remarks:** This area on Pelee Island has been part of a nature reserve since 1972. Yellow Warblers were more numerous than in 1975. Cowbirds (up to 3 males), Blue Jay and Com. Crow may have been residents but their behavior left us in doubt. Song Sparrows and certain other passerines seemed scarce, as they are on the island generally, perhaps because of insularity, or because of numerous snakes. One flicker nest was found. There were 3 broods of pheasants flushed by the dog. — *CRAIG CAMPBELL* and *GREGORY DONALDSON* (co-compilers), Box 747, Waterloo, Ont., Canada N2J 4C2.

#### 75. MIXED SWAMP AND ABANDONED FIELD.

— **Location:** Ontario; 4.8 km (3 mi) N of Acton, Conc 3, Lot, 5, Parcel 7. Plot center military grid co-ordinate 736355, Map #40P9. **Continuity:** New. **Size:** 4.85 ha = 12.0 acres (2.22 ha in swamp, 2.63 ha in field; 146 3 x 331.6 m (480 x 1,088 ft) by survey). **Description of Plot:** The dominant tree species in the swamp are Silver Maple (*Acer saccharinum*), E. Hemlock (*Tsuga canadensis*), Black Ash (*Fraxinus nigra*), E. White Cedar (*Thuja occidentalis*), and Quaking Aspen (*Populus tremuloides*), with much standing deadwood. There are 2 concentrations of standing water, each with a depth of less than 75 cm, one of which is adjacent to a pond whose maximum depth is 1 to 1.5 m. The drier sections of the swamp consist of organic mucks and only in a few places is the ground firm. The hemlock, cedar, and aspen are largely confined to the drier areas. The latter species is concentrated in 2 stands near the pond and a third (secondary regrowth) on the edge of the north field. There is also a scattering of White Birch (*Betula papyrifera*), Yellow Birch (*B. lutea*) and Tamarack (*Larix laricina*) throughout the dry area. Cedar is the dominant edge species, maple and ash are largely confined to the wetter areas. The ground cover in the drier areas consists of Round-leaved Dogwood (*Cornus rotundifolia*), Ground Hemlock (*Taxus canadensis*), Mountain Maple (*A. spicatum*), and Sensitive Fern (*Onoclea sensibilis*). There is much fallen deadwood throughout the swamp making walking difficult but providing abundant habitat for fungi. The open field is divided into 2 segments bisected by the swamp. The sizes are 1.82 ha (4.5 ac.) for the north field and .81 ha (2 ac.) for the south. The north field had been planted in mixed grains but was abandoned in 1959. There is one single-family dwelling in the S-E corner. Local regeneration of Soft Maple, White Cedar, and Am Elm (*Ulmus americana*), all less than 1 m in height, and a healthy stand of aspen, 6-8 m high, is occurring in the N field. Herbaceous cover, typical of southern Ontario fields, includes goldenrod (*Solidago* sp.), milkweed (*Asclepias* sp.), Plantain (*Plantago major*), Heal-all (*Prunella vulgaris*), Aster sp., Yarrow (*Achillea millefolium*), Clover (*Trifolium* sp.), Queen Anne's Lace (*Daucus carota*) and other common plants. The south field has scattered regeneration with numerous Tamaracks and willow (*Salix* sp.). Numerous grasses compose the ground cover. **Weather:** Generally clear with no wind; lowest starting temperature 5°C, highest finishing temperature 29°C. **Coverage:** May 22, 28; June 4, 9, 29-30; July 8; 0600-1000. Total man-hours: 28. **Census:** Red-winged Blackbird, 6 (124, 50); Song Sparrow 3.5 (72, 29); Com. Flicker, 2; Great Crested Flycatcher, 2; Black-capped Chickadee, 2; E. Meadowlark, 2, N Oriole, 2; Com. Grackle, 2; Brown-headed Cowbird, 2,

Veery, 1 5, Starling, 1 5, Rose-breasted Grosbeak, 1 5, Ruffed Grouse, 1; Mourning Dove, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Am. Robin, 1; Cedar Waxwing, 1; Black-and-white Warbler, 1; Yellow Warbler, 1; N. Waterthrush, 1; Am. Goldfinch, 1; Chipping Sparrow, 1; White-throated Sparrow, 1; Pileated Woodpecker, 0.5; Bobolink, 0.5; Killdeer, +; Barn Swallow, +; Com. Crow, +; Wood Thrush, +; Cardinal, +; Indigo Bunting, +; Savannah Sparrow, +. **Total:** 38 species; 46 territorial males or females ( $947/\text{km}^2$ , 383/100 acres). **Visitors:** Great Blue Heron, Canada Goose, Mallard, Black Duck, Pintail, Red-tailed Hawk, Rock Dove, Chimney Swift, Red-headed Woodpecker, E. Phoebe, Alder Flycatcher, Least Flycatcher, House Wren, Bay-breasted Warbler, Com. Yellowthroat, Vesper Sparrow. **Remarks:** The following nests were found: Red-winged Blackbird, 4; E. Meadowlark, 2; Com. Flicker, 2; Mourning Dove; Downy Woodpecker; Ruffed Grouse; Great Crested Flycatcher; Song Sparrow. Thanks to P. F. Eagles for advice. — *M. SHARP, T. N. TOBIAS, Dept. of Man-Environment Studies, Univ. of Waterloo, Waterloo, Ont., Canada.*

Census 76 will be found on p. 14 as part of an article by PAUL EAGLES and TERRY TOBIAS.

**77. ASPEN CLEARCUT.** — **Location:** Minnesota; Itasca Co., Chippewa National Forest, NE  $\frac{1}{4}$  of SE  $\frac{1}{4}$ , Sec 3, T57N, R25W. **Continuity:** New. **Size:** 10.4 ha = 25 7 acres. **Description of Plot:** This area was clear-cut logged in early 1974. At the time of the census, maximum sapling height was 12 ft, with Aspen (*Populus tremuloides* and *P. grandidentata*) the dominant species. Paper Birch (*Betula papyrifera*) and Red Maple (*Acer rubrum*) also occur. Understory species include raspberry (*Rubus spp.*), Bracken (*Pteridium aquilinum*), Bush Honeysuckle (*Dierilla lonicera*), Round-leaved Dogwood (*Cornus rugosa*), and willow (*Salix spp.*). **Edge:** Bordered on the W by similar vegetation; on the S by a Black Spruce bog, an aspen-birch woods, and similar vegetation; on the E by aspen-birch; and on the N by a young Red Pine (*Pinus resinosa*) plantation. **Topography:** Rolling. **Elevation:** 1410 ft. **Coverage:** June 2-3, 9-11, 16-17, 20-21; 0530-1000. Total man-hours: 28 5. **Census:** Chestnut-sided Warbler, 31 (298, 121); White-throated Sparrow, 7.5 (72, 29); Mourning Warbler, 7 (67, 27); Song Sparrow, 6.5 (62, 25); Golden-winged Warbler, 6 (58, 23); Gray Catbird, 5.5 (53, 21); Alder Flycatcher, 5 (48, 19); Veery, 4.5 (43, 18); Am. Goldfinch, 3 (29, 12); Com. Yellowthroat, 2.5; Rose-breasted Grosbeak, 1.5; Indigo Bunting, 1.5; Black-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Tree Swallow, 1; Black-and-white Warbler, 1; Brown-headed Cowbird, 1; Rufous-sided Towhee, 1; E. Kingbird, 0.5; Brown Thrasher, 0.5; Killdeer, +; Chimney Swift, +; Hairy Woodpecker, +; Blue Jay, +; Cedar Waxwing, +; Nashville Warbler, +; Connecticut Warbler, +. **Total:** 27 species; 8.5 territorial males ( $851/\text{km}^2$ , 344/100 acres). — *DEANNA K. DAWSON and JOHN R. PROBST, North Central Forest Experiment Station, Forest Service, USDA, 1992 Folwell Ave., St. Paul, Minn. 55108.*

**78. MIXED WETLAND WITH TAMARACK AND ASPEN GROVES, SHRUBLAND AND FEN.** — **Location:** Wisconsin; Waukesha Co., Falk Woods Nature Conservancy Area, 3 mi S of Waukesha, 2.5 mi S of intersection of County Highways A and F; 42°56'N, 88°14'W, Muskego Quadrangle, USGS. **Continuity:** New. **Size:** 16.9 ha = 41.7 acres (approximately quadrangular, E side irregular, 410 m; S bounded by a footpath approx 405 m; W 522 m; N 380 m; NE corner irregularly beveled; planimetered from aerial survey map). **Description of Plot:** The major vegetational communities are tamarack groves (about 25%), aspen groves (15%), shrubland (30%), and fen (30%). The predominant tree in the tamarack groves is Tamarack (*Larix laricina*); Quaking Aspen (*Populus tremuloides*) predominates in the aspen groves, willow (*Salix spp.*) and dogwoods (*Cornus spp.*) are dominant in the shrubland; and while the dominant species in the fen are sedges (*Carex spp.*) and *Potentilla fruticosa*, a large diversity of other vegetation is present. A quantitative survey based on a quarter-point survey of 20 points in the Tamarack groves showed a relative density of 96%, a relative dominance of 98%, and a frequency of 87%. Trees by class size N/A. The most frequent understory species was Red Osier Dogwood (*C. stolonifera*). A quarter-point survey of 10 points in the aspen groves showed a relative density of 93%, a relative dominance of 95%, and a frequency of 77%. A survey of the shrubland based on 12 transects of 5 m each showed a relative cover of 49% and a frequency of 36% for Red Osier Dogwood, and a relative cover of 28% and a frequency of 43% of six willow species. A survey of the fen based on 12 transects of 5 m each showed a relative cover of 34% and a frequency of 16% for sedges, and a relative cover of 18% and a frequency of 11% for *Potentilla*. Ground cover in the fen neared 100%. **Edge:** Bordered on W and N by similar vegetation, E by a wide grassy roadside and a small plot of cropland, and S by upland hardwood forest. **Topography:** Essentially flat with gentle slope to the NW. Numerous springs occur at the base of a morainic ridge to the S of the plot. Drainage patterns are poorly defined but gradually converge in the NW part of the plot to form the headwaters of Redwing Creek. **Elevation:** 825-855 ft. **Weather:** Normal temperatures (45-90°F) and precipitation following an abnormally hot and dry month. **Coverage:** June 4, 12, 14, 16, 19, 22, 25, 27; July 3, 6; 0530-1000 except one trip 1530-1715. Total man-hours: 21. **Census:** Com. Yellowthroat, 15 (89, 36); Red-winged Blackbird, 15; Song Sparrow, 13 (77, 31); Yellow Warbler, 11 (65, 26); Swamp Sparrow, 10 (59, 24); Gray Catbird, 8 (47, 19); Willow Flycatcher, 4.5 (27, 11); Great Crested Flycatcher, 4 (24, 10); Black-capped Chickadee, 4; Veery, 4; Indigo Bunting, 4; Alder Flycatcher, 3 (18, 7); Am. Robin, 3; Blue-winged Warbler, 3; Mourning Dove, 2; Com. Flicker, 2; Downy Woodpecker, 2; Wood Thrush, 2; Great Horned Owl, 1; Blue Jay, 1; House Wren, 1; Black-and-white Warbler, 1; Brown-headed Cowbird (female), 1; N. Oriole, 1; Cardinal, 1; Rose-breasted Grosbeak, 1; Rufous-sided Towhee, 1; Red-eyed Vireo, +. **Total:** 28 species; 118.5 territorial males or females ( $702/\text{km}^2$ , 284/100 acres). **Visitors:** Ring-necked Pheasant, Am. Woodcock, Yellow-billed Cuckoo, Ruby-throated Hummingbird, Red-headed Woodpecker, E. Kingbird, Cedar Waxwing, Mourning Warbler, Com. Grackle, E. Meadowlark. **Remarks:** 1 Red-winged Blackbird nest located. Fledglings noted: Black-capped Chickadee, Red-winged Blackbird, N. Oriole. Special

thanks to David Steingraeber for the quantitative habitat description and Charles Weise for general assistance. —  
*VERNON D. AUNE, S. 13, W. 22167 Ridge Road,  
Waukesha, Wis. 53186.*

**79. DECIDUOUS CLEARCUT.** — **Location:** Tennessee; Washington Co., House Cove Gap; about 4.5 mi S of Johnson City; 36°14'N, 82°22'W, Erwin Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 20.23 ha = 50 acres. **Description of Plot:** See AB 1117-8 (1975). **Weather:** Generally warm and clear. **Coverage:** May 27-31; June 3-4, 6, 8; 0600-0800. Total man-hours: 13. **Census:** Indigo Bunting, 13 (64, 26); Rufous-sided Towhee, 8 (40, 16); Yellow-breasted Chat, 6 (30, 12); White-eyed Vireo, 4 (20, 8); Kentucky Warbler, 4; Hooded Warbler, 4; Prairie Warbler, 3 (15, 6); Ruby-throated Hummingbird, 2; Cardinal, 2; Com. Flicker, 1; E. Wood Pewee, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Chestnut-sided Warbler, 1; Brown-headed Cowbird (female), 1; Downy Woodpecker, +. **Total:** 17 species; 53 territorial males or females (262/km<sup>2</sup>, 106/100 acres). **Remarks:** Nest found, Com. Flicker. An increase of 65% in total density from last year was observed. some of the most noted increases included Indigo Bunting (9 to 13), White-eyed Vireo (+ to 4), Kentucky Warbler (2 to 4), Hooded Warbler (+ to 4), and Prairie Warbler (0 to 3). Carolina Wren, which was present in good numbers in the two previous censuses (5 in 1975 and 4 in 1976), was absent this year. The Chestnut-sided Warbler, which normally nests above 3500 ft elevation in this area, was unusual here (2400 ft). — *RICHARD LEWIS, Rte. 3, Box 683B, Erwin, Tenn. 37650.*

**80. PASTURES WITH BRUSH, WOODED STRIPS, AND SCATTERED TREES.** — **Location:** Tennessee; Putnam Co., about 5 mi NW of Monterey, in Barnes Hollow to NW of Lee Knob; 36°9'45"N, 85°22'W, Monterey Quadrangle, USGS. **Continuity:** New. **Size:** About 8.7 ha = 21.5 acres (very irregular, surveyed with steel tape). **Description of Plot:** The 6 pastures (separated by hedgerows or wooded strips) are dominated by Fescue (*Festuca elatior*) in the less steep portions. Broomsedge (*Andropogon virginicus*) is abundant as are numerous other grasses and forbs. Scattered trees 3 to 15 in dbh are in all the pastures; saplings are numerous in the brushy areas (mostly on steeper slopes). Frequent tree species are: Tulip-tree (*Liriodendron*), Flowering Dogwood (*Cornus florida*), Redbud (*Cercis*), Red Cedar (*Juniperus virginiana*), Virginia Pine (*Pinus virginiana*), Sourwood (*Oxydendrum*), Persimmon (*Diospyros*), Tupelo (*Nyssa sylvatica*), Sassafras, Red Maple (*Acer rubrum*), White Ash (*Fraxinus americana*), Winged Elm (*Ulmus alata*), Sycamore (*Platanus*), White Oak (*Quercus alba*) and other oaks, hickories (*Carya* spp.), Hornbeam (*Carpinus*), and Buckthorn (*Rhamnus caroliniana*). The bottomland wooded strips include many of the above trees, also Black Walnut (*Juglans nigra*), Beech (*Fagus*), Sugar Maple (*A. saccharum*), Buckeye (*Aesculus octandra*), Slippery Elm (*U. rubra*), and hackberry (*Celtis* sp.). Other numerous woody plants on the plot are brambles (*Rubus* spp.), Winged Sumac (*Rhus copallina*), Spicebush (*Lindera benzoin*), Strawberry-bush (*Euonymus americanus*), Prairie Rose (*Rosa setigera*), wild grapes (*Vitis* spp.), greenbrier (*Smilax* spp.), Honeysuckle (*Lonicera japonica*), Poison Ivy (*Rhus radicans*),

and Cane (*Arundinaria gigantea*). Ground cover about 80 to 95%. Rocks, either detached or outcropping, of sandstone, limestone, or chert, are frequent. A rocky, usually dry creek crosses the plot; a jeep trail follows the bottom land and joins an improved dirt road at the NW end. **Edge:** Bordered on W by similar habitat; on other sides by woods or mixed-mesophytic forest. **Topography:** Gentle to rather steep (25%) slopes. **Elevation:** 1075-1280 ft. **Weather:** Rather hot, some dry spells (no severe drought). **Coverage:** May 11-12, 27, 31; June 2, 5-6, 17, 21; 0530-0900 (CDT), and 1930-2030. Total man-hours 20%. **Census:** Indigo Bunting, 8.5 (98, 40); Field Sparrow, 5 (57, 23); Yellow-breasted Chat, 4.5 (52, 21), White-eyed Vireo, 4 (46, 19); Blue-gray Gnatcatcher, 3.5 (40, 16); Prairie Warbler, 3 (34, 14); Red-eyed Vireo, 2.5, E. Wood Pewee, 2; Rufous-sided Towhee, 2; Cerulean Warbler, 1.5; Summer Tanager, 1.5; Ruby-throated Hummingbird, 1; Kentucky Warbler, 1; Com. Yellowthroat, 1; Cardinal, 1; Am. Goldfinch, 1; Yellow-billed Cuckoo, 0.5; Downy Woodpecker, 0.5; Tufted Titmouse, 0.5; Brown-headed Cowbird, 0.5; Red-tailed Hawk, +; Broad-winged Hawk, +; Screech Owl, +; Whip-poor-will, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Acadian Flycatcher, +; Carolina Chickadee, +; Yellow-throated Vireo, +; Scarlet Tanager, +. **Total:** 30 species; 45 territorial males or females (517/km<sup>2</sup>, 209/100 acres). **Visitors:** Turkey Vulture, Sharp-shinned Hawk, Chimney Swift, Barn Swallow, Purple Martin, Com. Crow, E. Bluebird. **Remarks:** No active nests located. Young Field Sparrows were numerous. About 25-30 beef cattle grazed the plot throughout the period — *RICHARD W. SIMMERS, JR., 128 Shipley St, Cookeville, Tenn. 38501.*

**81. DECIDUOUS CLEARCUT.** — **Location:** Georgia; Rabun Co.; Chattahoochee National Forest; 5 mi S of Clayton; Tiger Quadrangle, USGS. **Continuity:** New. **Size:** 6.88 ha = 17 acres (irregular, measured with tape). **Description of Plot:** The area was clearcut in 1974. Roads bulldozed and occasional trees left standing were Dogwood (*Cornus florida*), Sourwood (*Oxydendrum arboreum*), Serviceberry (*Amelanchier laevis*). The dominant sprout growth is from Red Maple (*Acer rubrum*), Black Gum (*Nyssa sylvatica*), Tulip-tree (*Liriodendron tulipifera*), Chestnut Oak (*Quercus prinus*), Black Locust (*Robinia pseudo-acacia*). Common shrubby species are Mountain Laurel (*Kalmia latifolia*), blackberry (*Rubus* sp.), Blueberry (*Vaccinium vacillans*). **Edge:** Bordered on the N by clearcut; E, W, S by mature forest; SE by gravelled Eastman Mtn Road. The census was not conducted within 50 ft of the forest edge or the road. **Topography:** On the SE slope of Boggs Mountain. **Elevation:** 2160-2360 ft. **Weather:** Extremely hot and dry; rainfall below normal. **Coverage:** April 28; May 13-15, 22, 28-29; June 4-5, 10-11, 25; July 3; 0700-1200. Total man-hours 21. **Census:** Rufous-sided Towhee, 10 (145, 59); Prairie Warbler, 4 (58, 24); Indigo Bunting, 3 (44, 18); Mourning Dove, 1; Carolina Wren, 1; Brown Thrasher, 1; E. Bluebird, 1; Yellow-breasted Chat, 1. **Total:** 8 species; 22 territorial males (320/km<sup>2</sup>, 129/100 acres). **Visitors:** Ruffed Grouse, Bobwhite, Yellow-billed Cuckoo, Ruby-throated Hummingbird, Com. Flicker, Hairy Woodpecker, Great Crested Flycatcher, E. Phoebe, Blue Jay, Carolina Chickadee, Solitary Vireo, Red-eyed Vireo, Black-and-white Warbler, Pine Warbler, Ovenbird, Hooded Warbler, Brown-headed Cowbird, Scarlet Tanager, Cardinal,



Census 81. Deciduous Clearcut. Photo/Louis Schweizer.

**Am. Goldfinch.** **Remarks:** A Mourning Dove nest with 2 eggs was located on the ground. Special thanks to Marie and E. O. Mellinger, Beanie Newhall, Sybil Arbery, Hester Wilks, and Dorothy Ickringill for their assistance.  
— LOUIS W. SCHWEIZER, 1729B LaVista Rd. NE, Atlanta, Ga. 30329.

**82. DISTURBED MIXED PRAIRIE.** — **Location:** Illinois; Grundy Co.; Goose Lake Prairie State Park, near Morris; bordered on the W by the Elgin, Joliet and Eastern RR., on the N by Collins Road and on the E and S by similar prairie; 41°23'N, 88°18'W, Monooka Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 16 ha = 39.5 acres. **Description of Plot:** See AB 29:1121-1122 (1975). **Weather:** Predominantly overcast but little rain during coverage. Temperature 60-90°F. **Coverage:** May 1; June 1, 18-19, 26-27; July 2-4, 8, 24; August 7, 14; 0500-1300. Total man-hours: 103.5. **Census:** Red-winged Blackbird, 5 (31, 13); Bell's Vireo, 4 (25, 10); Black-capped Chickadee, 3 (19, 8); Ring-necked Pheasant, 2; Gray Catbird, 2; Am. Robin, 2; Indigo Bunting, 2; Field Sparrow, 2; Am. Woodcock, 1; Mourning Dove, 1; Com. Flicker, 1; Downy Woodpecker, 1; Brown Thrasher, 1; Com. Yellowthroat, 1; E. Meadowlark, 1; Cardinal, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1. **Total:** 18 species; 32 territorial males ( $200/\text{km}^2$ , 81/100 acres). **Remarks:** Potholes and slough, dry all winter, were partially filled by late May rains. Utility company cleared right-of-way decimating approximately 80,000 Black Willows (*Salix nigra*) of 1 in. and under. Correction to 1976 census: Delete European Tree Sparrow. Thanks to the Nyhoff's for their hospitality and help and to the Tweits for their continued support. — JANICE LINKLETTER and FRED WOOLEY, 2211 W. Carmen Ave., Chicago, Ill. 60625.

**83. KENTUCKY BLUE GRASS PRAIRIE.** — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 12, T142N, R68W; 47°8'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 4.84 ha = 11.97 acres. **Description of**

**Plot:** See AB 26:972 (1972). This plot was subjected to a prescribed burn in fall 1972, and again on June 1, 1977. Censuses were performed both before and after the 1977 burn. The fire reduced nearly all vegetation to ashes, but growth resumed almost immediately. The two small seasonal wetlands in the plot were dry throughout the census period. **Weather:** Following a very dry summer and fall of 1976, little precipitation occurred in winter or early spring, and conditions were dry through the middle of May. Frequent rains during late spring enabled vegetation to grow, but were inadequate to restore wetlands. Precipitation totaled 3.29 in. in May and 2 in. in June. Temperatures in May were much above normal, with average extremes of 77 and 52°F. June was somewhat warmer than average; the daily low averaged 53°, the daily high, 78°. Phenologically, the spring season seemed about two weeks advanced from normal, with respect to both plants and birds. **Coverage (Pre-burn):** May 24-25 June 1; 4 trips, 0655-1010, CDT. **(Post-burn):** June 2, 8 16, 23, 29; July 6, 13; 7 trips, 0820-1040, CDT. Total man-hours: 3.2 **Census:** (Pre-burn): Bobolink, 1; W Meadowlark, 1; Red-winged Blackbird, 1; Savannah Sparrow, 0.5; Grasshopper Sparrow, 0.5; Brown-headed Cowbird (female), +. (Post-burn): Upland Sandpiper, 2 Killdeer, 1; W. Meadowlark, +; Red-winged Blackbird, +; Brown-headed Cowbird (female), +. **Total:** (Pre-burn): 6 species; 4 territorial males or females ( $83/\text{km}^2$ , 33/100 acres). (Post-burn): 5 species; 3 territorial males ( $62/\text{km}^2$ , 25/100 acres). **Visitors:** (Pre-burn): Blue winged Teal, Killdeer, Willet, E. Kingbird, W. Kingbird Barn Swallow, Yellow-headed Blackbird. (Post-burn) Red-tailed Hawk, Marbled Godwit, Com. Nighthawk, E Kingbird, Tree Swallow, Cliff Swallow, Yellow-headed Blackbird, Com. Grackle. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

**84. 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; 6 consecutive years. **Size:** 10 ha = 24.7 acres. **Description of Plot:** See AB 26:972 (1972). All wetlands were dry throughout the census period. **Weather:** See Census 83. **Coverage:** May 19, 24-25; June 1-2, 8, 16, 23; 8 trips, 0655-1000, CDT. Total man-hours: 6.5 **Census:** Clay-colored Sparrow, 7 (70, 28); Red-winged Blackbird, 3 (30, 12); Brown headed Cowbird (females), 2; Bobolink, 1.5; W Meadowlark, 1.5; Willow Flycatcher, 1; Gray Catbird, 1 Yellow Warbler, 1; Com. Yellowthroat, 1; Grasshopper Sparrow, 1; Mourning Dove, 0.5; E. Kingbird, 0.5, Savannah Sparrow, 0.5. **Total:** 13 species; 21.5 territorial males or females ( $215/\text{km}^2$ , 87/100 acres). **Visitors** Mallard, Gadwall, Blue-winged Teal, Ring-necked Pheasant, Killdeer, Upland Sandpiper, Willet, Barn Swallow, Cliff Swallow, Brown Thrasher, Am. Goldfinch — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

**85. 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; 6 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:972-973 (1972). This plot was burned in fall 1971 and spring 1976. Since the last burn, the vegetation, nearly all

herbaceous, has regrown and litter has begun to accumulate. The vegetation was resurveyed in 1977 to determine changes since 1972. A few patches of Choke Cherry (*Prunus virginiana*) were present. Wolfberry (*Symporicarpos occidentalis*) and Silverberry (*Elaeagnus commutata*) also occurred, but in low growth form, rather than dense thickets. Uplands were dominated by Alfalfa (*Medicago sativa*), Stiff Sunflower (*Helianthus rigidus*), Stiff Goldenrod (*Solidago rigidia*) and various grasses: Muhly (*Muhlenbergia cuspidata* and *M. racemosa*), Needle-and-thread (*Stipa comata*), Green Needlegrass (*Stipa viridula*), Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Andropogon scoparius*), Blue Grama (*Bouteloua gracilis*), Smooth Brome (*Bromus inermis*), Kentucky Bluegrass (*Poa pratensis*), Quackgrass (*Agropyron repens*). A sedge (*Carex filifolia*) was also fairly common, as well as many forbs. Wetlands were dominated by Sprangletop (*Scolochloa festucacea*) and Slough Sedge (*Carex atherodes*) in the central portion and various herbs in wet meadow zones. All six seasonal wetlands and two temporary wetlands were dry throughout the census period. **Weather:** See Census 83. **Coverage:** May 24-25, June 1-2, 8, 16, 23; 8 trips, 0655-1145, CDT. Total man-hours: 2.5. **Census:** W. Meadowlark, 1; Red-winged Blackbird, 2; Bobolink, 1.5; Grasshopper Sparrow, 1; W. Meadowlark, 0.5; Brown-headed Cowbird (female), 0.5; Clay-colored Sparrow, 0.5; Upland Sandpiper, +; E. Kingbird, +. **Total:** 8 species; 6 territorial males or females (98/km<sup>2</sup>, 40/100 acres). **Visitor:** Am. Goldfinch. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**86. MIXED PRAIRIE (III).** — **Location:** North Dakota; Stutsman Co., NW quarter of Sect. 6, T142N, R67W, 47°9'N, 99°14'W, Goldwin Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:973 (1972). This plot was burned fall 1970, spring 1975, and again on June 1, 1977. Censuses were conducted before and after this year's burn. Prior to the most recent burn, the herbaceous vegetation had substantially regrown, but shrubs, mostly Wolfberry (*Symporicarpos occidentalis*), were still reduced in stature. The seasonal wetlands were dry throughout the census period. **Weather:** See Census 83. **Coverage** (Pre-burn): May 19, 24-25; June 1; 6 trips, 0655-0950, CDT. (Post-burn): June 2, 8, 16, 23, 29; July 6, 13, 7 trips, 0830-1100, CDT. Total man-hours: 4.1. **Census** (Pre-burn): Bobolink, 1; W. Meadowlark, 1; Red-winged Blackbird, 1; Brown-headed Cowbird (female), 1; Grasshopper Sparrow, 1; E. Kingbird, 0.5; Upland Sandpiper, +. (Post-burn): Killdeer, 2; Upland Sandpiper, 1; Com. Nighthawk, +; W. Meadowlark, +; Grasshopper Sparrow, +; Clay-colored Sparrow, +. **Total** (Pre-burn): 7 species; 5.5 territorial males or females (90/km<sup>2</sup>, 37/100 acres). (Post-burn): 6 species; 3 territorial males (49/km<sup>2</sup>, 20/100 acres). **Visitors** (Pre-burn): Barn Swallow, Yellow-headed Blackbird, Am. Goldfinch. (Post-burn): Willet, Bank Swallow. **Remarks:** The post-burn Grasshopper and Clay-colored Sparrows did not appear until July, after a month of plant growth. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**87. 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, 6 consecutive years. **Size:** 6.1 ha = 15.06 acres. **Description of Plot:** See AB 26:973-974 (1972). This plot was burned in spring 1970, fall 1972, and again spring 1976. Vegetation has regrown since the last fire. All wetlands on the plot were dry throughout the census period. **Weather:** See Census 83. **Coverage:** May 24-25; June 1-2, 8, 23; 8 trips between 0655-1145 hours, CDT. Total man-hours: 2.5. **Census:** Red-winged Blackbird, 2; Bobolink, 1.5; Grasshopper Sparrow, 1; W. Meadowlark, 0.5; Brown-headed Cowbird (female), 0.5; Clay-colored Sparrow, 0.5; Upland Sandpiper, +; E. Kingbird, +. **Total:** 8 species; 6 territorial males or females (98/km<sup>2</sup>, 40/100 acres). **Visitor:** Am. Goldfinch. — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**88. 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; 6 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, paced). **Description of Plot:** See AB 26:974 (1972). After a series of prescribed burns and two seasons of intensive sheep-grazing, most woody vegetation has been killed, although dead trunks and branches remain. Grasses and forbs have regrown since the most recent burn in May 1976. The vegetation was resurveyed in 1977. The succession of burns and intensive sheep-grazing has reduced the thickets of Hawthorn (*Crataegus chrysocarpa*), Choke Cherry (*Prunus virginiana*) and Wolfberry (*Symporicarpos occidentalis*) to scattered individuals. Blue Grama (*Bouteloua gracilis*) and Fringed Sage (*Artemisia frigida*) were abundant in the uplands. **Weather:** See Census 83. **Coverage:** June 1-2, 8, 23; 7 trips 0700-1105, CDT. Total man-hours: 2.7. **Census:** Grasshopper Sparrow, 3 (49, 20); E. Kingbird, 1; Bobolink, 1; W. Meadowlark, 1; Red-winged Blackbird, 0.5; Brown-headed Cowbird (female), 0.5; Chestnut-collared Longspur, 0.5; Upland Sandpiper, +; Marbled Godwit, +; W. Kingbird, +. **Total:** 10 species; 7.5 territorial males or females (123/km<sup>2</sup>, 50/100 acres). **Visitors:** Willet, Brown Thrasher. **Remarks:** I am grateful to Russell Kologiski for surveying the vegetation — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**89. 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; 2 intermittent years. **Size:** 8.7 ha = 21.50 acres (rectangular, 518 x 168 m, paced). **Description of Plot:** See AB 27:990 (1973). Grazed through 1967 and left idle until June 1974, when it was incompletely burned. Additional burns were made in May of 1975 and 1976. Seven seasonal wetlands partially or entirely within the plot were dry throughout the census period. **Weather:** See Census 83. **Coverage:** May 25; June 1-2, 8, 16; 7 trips, 0700-1130, CDT. Total man-hours 3.2. **Census:** Red-winged Blackbird, 3.5 (40, 16); W. Meadowlark, 1.5; Brown-headed Cowbird (female), 1; Bobolink, 0.5; E. Kingbird, +; Savannah Sparrow, +; Grasshopper Sparrow, +. **Total:** 7 species; 6.5 territorial males or females (75/km<sup>2</sup>, 30/100 acres). **Visitors:** Sharp-tailed Grouse, Killdeer, Upland Sandpiper, Black Tern, W. Kingbird, Barn Swallow, Am. Goldfinch — *DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.*

**90. SANDHILL PRAIRIE.** — **Location:** Kansas, Harvey Co., Sand Prairie Natural History Reservation, 4 mi E and 4 mi N of Burton; E½SE¼ Sect. 36, R3W, T22S, 38°5'N, 97°36'W, Halstead Quadrangle, USGS. **Continuity:** Established 1967; 9 intermittent years. **Size:** 32.38 ha = 80 acres. **Description of Plot:** See AB 29: 1146-1147 (1975). **Weather:** Cloudy to partly cloudy on 7 of 8 censuses; light winds; wetlands mostly dried out. **Coverage:** June 11, 14, 18, 21, 23-25, 29; 0550-0815. Total man-hours: 35. **Census:** Mourning Dove, 8 (25, 10); Bobwhite, 6 (19, 8); Field Sparrow, 6; N. Oriole, 5.5 (17, 7); E Kingbird, 5 (15, 6); Yellow-billed Cuckoo, 4 (12, 5); Cardinal, 3.5 (11, 4); Ring-necked Pheasant, 3 (9, 4); Com. Yellowthroat, 2; Barn Swallow, 1.5; Orchard Oriole, 1.5; Great Horned Owl, 1; Blue Jay, 1; Great Crested Flycatcher, 1; House Wren, 1; Brown Thrasher, 1; E Meadowlark, 1; Indigo Bunting, 0.5. **Total:** 18 species, 52.5 territorial males ( $162/\text{km}^2$ , 66/100 acres). **Remarks:** An average of 12 male and 4 female Brown-headed Cowbirds were seen per census. Eight nests were found (2 E. Kingbird, 2 N. Oriole, 1 Mourning Dove, 1 Blue Jay, 1 E. Meadowlark, 1 Cardinal). The Gray Catbird, Bell's Vireo and Red-winged Blackbird, nesting on most previous censuses, were not found this year. — *DEBBIE HUNSMERGER, JANET MOYER, DWIGHT R PLATT (compiler) and RICHARD PLATT, Dept. of Biology, Bethel College, North Newton, Kans. 67117.*

**91. MIXED HABITAT - DISTURBED BOTTOM-LAND.** — **Location:** Oklahoma; Washington Co., Dewey, 2 mi W of intersection of Ninth St. and Hwy 75 and 0.3 mi N on E bank of Caney River; 36°48'N, 95°58'W, Tulsa Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 26:976-977 (1972). **Weather:** Mild and dry. Temperature extremes on count days (which were clear to partly cloudy) were 52° and 92°F. **Coverage:** April 9, 16, 22, 29; May 6, 18, 25, 29-30; June 2, 13, 22, 29; 0650-1300, 1315-1630. Total man-hours: 45. **Census:** Indigo Bunting, 15.5 (38, 16); Blue-gray Gnatcatcher, 14 (35, 14); Red-winged Blackbird, 11 (27, 11); Cardinal, 10 (25, 10); Com. Yellowthroat, 8.5 (21, 9); Yellow-billed Cuckoo, 6.5 (16, 7); Ruby-throated Hummingbird, 6 (15, 6); Brown-headed Cowbird, 5 (12, 5); Am. Goldfinch, 4 (10, 4); Field Sparrow, 4; Tufted Titmouse, 3.5 (9, 4); Yellow-breasted Chat, 3.5; Painted Bunting, 3.5; Dickcissel, 3.5; E. Wood Pewee, 3 (7, 3); Blue Jay, 3; Carolina Chickadee, 3; Red-eyed Vireo, 3; Red-bellied Woodpecker, 2.5; Downy Woodpecker, 2.5; N. Parula, 2; Kentucky Warbler, 2; E. Meadowlark, 2; Bobwhite, 1; Red-headed Woodpecker, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; Acadian Flycatcher, 1; Rough-winged Swallow, 1; White-breasted Nuthatch, 1; E. Bluebird, 1; Warbling Vireo, 1; Red-shouldered Hawk, 0.5; Barred Owl, 0.5; Orchard Oriole, 0.5; Com. Flicker, +; Brown Thrasher, +; Wood Thrush, +; Prothonotary Warbler, +; N. Oriole, +; Blue Grosbeak, +. **Total:** 41 species; 132 territorial males ( $326/\text{km}^2$ , 132/100 acres). **Remarks:** The marsh has been dry for two years. Cattails were scattered and only a few female Red-wings found nesting sites. Carolina Wrens were absent. The Wood Thrush was a new species. — *ELLA DELAP, 409 N. Wyandotte, Dewey, Okla. 74029.*

**92. FLOODPLAIN COTTONWOOD FOREST.** — **Location:** Colorado; Jefferson Co., about 10 mi SW of

Denver, NE/4, Sect. 14, T6S, R69W, 6th P M , 39°32'N, 105°5'W, Littleton Quadrangle, USGS. **Continuity:** Established 1971; 7 consecutive years. **Size:** 9.7 ha = 24 acres. **Description of Plot:** See AB 25:966 (1971). **Weather:** Winter and spring through June much drier than normal; July normal. **Coverage:** March 26; April 9, May 1, 15, 22, 28; June 4-5, 11, 14, 26; July 2, 9, 16-17, 23; 0615-1930. Total man-hours: 37. **Census:** Great Blue Heron, 42 (432, 175); House Wren, 26 (268, 108); Starling, 12 (124, 50); Com. Yellowthroat, 12; Com. Grackle, 12; Mourning Dove, 7 (72, 29); Yellow Warbler, 7; Com. Flicker, 6 (62, 25); Am. Robin, 6; Song Sparrow, 6; Lazuli Bunting, 5 (51, 21); W. Meadowlark, 4 (41, 17); N. Oriole, 4; E. Kingbird, 3 (31, 13); Am. Kestrel, 2; Downy Woodpecker, 2; Black-billed Magpie, 2; Black-capped Chickadee, 2; Gray Catbird, 2; Warbling Vireo, 2; Yellow-breasted Chat, 2; Red-winged Blackbird, 1.5; Great Horned Owl, 1; W. Kingbird, 1; Tree Swallow, 1; Am. Goldfinch, 1; Rufous-sided Towhee, 1; Belted Kingfisher, +; Brown-headed Cowbird, +. **Total:** 29 species, 172.5 territorial males ( $1776/\text{km}^2$ , 719/100 acres). Excluding the colonial nesting herons, 130.5 territorial males ( $1344/\text{km}^2$ , 544/100 acres). **Remarks:** The population reached its highest total in the 7 years of the census — 8 territorial males higher than the first year — with 30% more heron nests than last year and an increase in the balance of the population to slightly more than the 6-year average. As reported last year, only about 25% of the cottonwoods are still alive. Perhaps 10% of the dead trees have fallen. The live trees remain in stands among expanses of dead trees. The open areas of dead trees have created hot micro-climates, which contrast with milder daytime temperatures in the canopied sections. Nonetheless a number of species that normally nest in deciduous, leafy trees, persisted in less-than-ideal conditions. Most warblers, robins, and orioles confined their nest sites to live patches, and all canopy nesters have declined. The high non-heron population arises in part from a new species, Com. Grackle, which arrived *en masse*. Hole-nesting species, utilizing dead trees, continue to increase a little — flicker, woodpecker, Starling — and the House Wrens have maintained almost average numbers. The herons increased by 10 pairs over last year; and from 9 pairs in 1971 to this year's 42. The new reservoir has provided more extensive feeding sites close in, and it has also led to an undisturbed nesting site. This year, for the first time, herons perched in trees away from the heronry; the young fledged 1-2 weeks earlier than usual, nesting possibly accelerated by the dry, warm spring. The only species recording new peaks this year besides the grackle was Song Sparrow, up to 6 from a previous high of 2. Up from their average populations were yellow-throats and flickers, each double the 6-year average. Dropping were canopy nesters: robins, Yellow Warblers, orioles, and goldfinches, each less than half of its 6-year average. The Yellow Warbler has dropped especially this year, from a previous low of 10 in 1975, and from a 6-year average of 16. For herons, grackle, and Starling, the population reported equals the number of nests found. These species are apparently non-territorial, except perhaps around the immediate vicinity of their nests, and each feeds far from the nest site, outside the plot. 94 Nests found: 42 heron, 12 Starling, 12 grackle, 9 wren, 6 flicker, 4 robin, 2 magpie and oriole, and one each of owl, Downy Woodpecker, E. Kingbird, chickadee, and Song Sparrow. The plot is located in Chatfield State Park, and

we thank Ron Madsen, and his staff, for providing access. — *FRANK and JAN JUSTICE, URLING KINGERY, HUGH KINGERY* (compiler), 869 Milwaukee St., Denver, Colo. 80206.

### 93. FLOODPLAIN COTTONWOOD FOREST. —

**Location:** Colorado; Weld Co., on the W bank of the South Platte River about 6 mi S and 1.5 mi E of Johnstown, extends from the confluence of the St. Vrain Creek and South Platte River S about .7 mi. Parts of Sects. 34 & 35 T4N, R67W, 40°21'N, 104°14'W, Milliken Quadrangle, USGS. **Continuity:** Established 1973; 5 consecutive years. **Size:** 52.2 ha = 128.9 acres. **Description of Plot:** See AB 27:997 (1973). **Weather:** Mostly clear, dry and warm throughout period. **Coverage:** May 6, 13, 24, 31, June 7, 14, 22, 28; 0600-0945. Total man-hours: 19. **Census:** House Wren, 58 (111, 45); Starling, 45 (86, 35); Mourning Dove, 8 (15, 6); Com. Yellowthroat, 8; Com. Flicker, 7 (13, 5); Brown-headed Cowbird, 7; E. Kingbird, 5 (10, 4); Red-winged Blackbird, 4 (8, 3); N. Oriole, 3 (6, 2); Killdeer, 2; Am. Robin, 2; W. Meadowlark, 2; Song Sparrow, 2; Am. Kestrel, 1; Belted Kingfisher, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; Yellow Warbler, 1; Yellow-breasted Chat, 1; Lazuli Bunting, 1. **Total:** 23 species; 163 territorial males (312/km<sup>2</sup>, 126/100 acres). **Remarks:** An increase of 16% in territorial males over 1976 was seen. This is mostly attributable to an increase in Starlings and to the inclusion of Brown-headed Cowbirds in this year's data. The number of breeding species decreased by 3 from 1976 but most breeding birds occurred in similar numbers. — *LADISLAV R. HANKA, Dept. of Zool. and Ent., Colorado State Univ., Fort Collins, Colo. 80523.*

### 94. SYCAMORE - COAST LIVE OAK RIPARIAN WOODLAND. —

**Location:** California; Orange Co., on the Starr Ranch Audubon Sanctuary, in Bell Canyon, 4.5 mi SE of Trabuco Canyon Post Office (5 mi N of the entrance to Ronald W. Caspers Regional Park on the Ortega Highway); 33°36'30"N, 117°34'W, Cañada Gobernadora Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 6.8 ha = 16.8 acres. **Description of Plot:** See AB 31:70 (1977). **Weather:** Morning temperatures 39-52°F, averaging 46°. Precipitation: 2.34 in. **Coverage:** April 12, 19, 25; May 2, 14-15, 18, 20; 0510-0940 Total man-hours: 62. **Census:** House Wren, 15.5 (228, 92); Starling, 10 (147, 60); Lesser Goldfinch, 6.5 (96, 39); Ash-throated Flycatcher, 5 (74, 30); Plain Titmouse, 5; Orange-crowned Warbler, 5; Com. Bushtit, 4.5 (66, 27); Rufous-sided Towhee, 4.5; Brown Towhee, 4.5; Western Flycatcher, 4 (59, 24); Scrub Jay, 4; Bewick's Wren, 3.5 (51, 21); Hutton's Vireo, 3.5; N. Oriole, 2.5; Mourning Dove, 2; Black-chinned Hummingbird, 2; Com. Flicker, 2; Acorn Woodpecker, 2; Nuttall's Woodpecker, 2; W. Wood Pewee, 2; Black-headed Grosbeak, 2; White-breasted Nuthatch, 1.5; Am Kestrel, 1; Costa's Hummingbird, 1; Anna's Hummingbird, 1; W. Bluebird, 1; Warbling Vireo, 1; Brown-headed Cowbird (female), 1; House Finch, 1; Song Sparrow, 1; Red-shouldered Hawk, 0.5; Barn Owl, +. **Total:** 32 species; 102 territorial males or females (1500/km<sup>2</sup>, 607/100 acres). **Visitors:** Red-tailed Hawk, California Quail, Wrentit. **Remarks:** 32 nests of the following species were located: House Wren, 11; Starling, 10; Com. Bushtit, 2; Bewick's Wren, 2; Red-shouldered Hawk, 1; Black-chinned Hummingbird, 1;

Plain Titmouse, 1; White-breasted Nuthatch, 1; W. Bluebird, 1; Hutton's Vireo, 1; Orange-crowned Warbler, 1. — *BOB and RUTH LOVELESS, Starr Ranch Audubon Sanctuary, P.O. Box 157, San Juan Capistrano, Calif. 92675.*

### 95. SYCAMORE-COAST LIVE OAK RIPARIAN WOODLAND. —

**Location:** California; Orange Co., on the Ronald W. Caspers Regional Park in Bell Canyon, 6.1 mi SE of Trabuco Oaks Post Office; 33°35'33"N, 117°34'W, Cañada Gobernadora Quadrangle, USGS. **Continuity:** New. **Size:** 7.2 ha = 17.8 acres (rectangular, 120 x 600 m); measured with tape). **Description of Plot:** Typical canyon-bottom riparian woodland, mostly closed canopy of Sycamore (*Platanus racemosa*), and Coast Live Oak (*Quercus agrifolia*) with about 20% open grassy area. Understory shrubs in order of relative frequency are California Sagebrush (*Artemesia californica*), Black Sage (*Salvia mellifera*), Prickly Pear (*Opuntia* sp.), Mulefat (*Baccharis* sp.). White Sage (*S. apiana*), California Buckwheat (*Eriogonum fasciculatum*), Cardoon (*Cynara cardunculus*), Poison Oak (*Toxicodendron diversilobum*), Laurel Sumac (*Rhus laurina*), and several unidentified grasses. A dry stream bed approximately 75 ft wide transects the plot. Discontinuous clumps of Mulefat grow along the stream bank and in the bed. A quantitative survey gave the following results. Trees, 3 in. diameter and over, based on ten 0.1 acre square samples, 800/acre; total basal area 159.7 sq ft/acre. Species comprising 100% of the total number of trees (figures after each number of trees/acre, relative density in percent, relative dominance and relative frequency in that sequence) Sycamore 590, 74, 51, 70; Coast Live Oak 210, 26, 49, 80. There are a small number of dead trees on the ground. Trees by diameter size class (figures after each class give number of trees/acre, relative density in percent, basal area in sq ft/acre, relative dominance in percent): A (3-6 in.) 280, 35, 28, 2; B (6-9 in.) 90, 11, 27, 2; C (9-15 in.) 110, 14, 88, 6; D (15-21 in.) 60, 8, 108, 7; E (21-27 in.) 90, 11, 279, 17; F (26-33 in.) 80, 10, 392, 25; G (33-40 in.) 50, 6, 355, 22; H (> 40 in.) 40, 5, 320, 20. Shrub stems/acre 15,850; ground cover 48.5%; canopy cover 35.5%, average canopy height 31.4 ft (range 9-45 ft). Plants providing seeds are the Sycamore, Coast Live Oak, California Buckwheat, and miscellaneous shrubs. Tree Tobacco (*Nicotiana glauca*) was blooming and provides a source of nectar for hummingbirds. This was a very dry year and few annual plants were blooming. No running water was on the plot. **Weather:** The average maximum-minimum temperatures were 71/48°F. The highest temperature was 85° and the lowest was 41°. Approximately half of the days were overcast. All the rain (2.34 in.) fell on May 8-9. **Edge:** Bordered on the E by a slope covered with the typical coastal sage plants already listed. On the W a gentle grass-covered slope that gradually steepens to a 75 ft wall covered with Laurel Sumac and oak. Contiguous riparian woodland lies N and S. **Topography:** Flat. **Elevation:** 520 ft. **Coverage:** Apr. 23-May 22; 9 surveys Average time per survey: 175 minutes; 0630-0930 (6) and 1600-1900 (3). Total man-hours: 26. In addition, 6 hours were spent locating nests. **Census:** House Wren, 10 (139, 156); Scrub Jay, 7.5 (104, 42); Ash-throated Flycatcher, 5 (69, 28); Brown Towhee, 5; Acorn Woodpecker, 4.5 (62, 25); Starling, 4.5; Mourning Dove, 3 (42, 17); Plain Titmouse, 3; Com. Bushtit, 3; Com. Flicker, 2.5; Cactus Wren, 2.5; Nuttall's Woodpecker, 2; Rufous-sided Towhee, 1.5; Am Kestrel, 1; Barn Owl, 1; Poor-will, 1,

Anna's Hummingbird, 1; Western Flycatcher, 1; Wren-tit, 1; White-breasted Nuthatch, 1; W. Bluebird, 1. **Total:** 21 species; 62 territorial males or females (861/100 ha, 348/100 acres). **Remarks:** Nests located: Mourning Dove, 3; House Wren, 3; Acorn Woodpecker, 2; Cactus Wren, 2; Am. Kestrel, 1; Anna's Hummingbird, 1; Com. Flicker, 1; Starling, 1. We thank Erin Flanagan for help laying out the plot and Kathy Bishop and Karen Cox for doing the vegetation analysis. — *THOMAS R. GUNDY and PATRICIA A. FLANAGAN, 2412 Teasley, La Crescenta, Calif. 91214.*

**96. WILLOW RIPARIAN.** — **Location:** California; Inyo Co., E slope of the Inyo Mtns., at Willow Creek Camp, 43.2 mi SE of Big Pine, along Saline Valley Rd., Sec 2, T13S, R37E, Waucoba Wash Quadrangle, USGS; 36°50'N, 117°55'W. **Continuity:** New. **Size:** 3.66 ha = 9.04 acres (1335 m long and a mean width of 27.4 m. Width varies from 7 to 62 m depending on width of vegetation). **Description of Plot:** A riparian and mesquite community along the lower portion of Willow Creek in one of the E facing canyons of the Inyo Mtns.; the canyon drains into Saline Valley. The plot follows a permanent stream (E - W in direction) and lies at the mouth of Willow Creek Canyon. The vegetation varies in density; the lower E end and upper W end contain dense stands of trees, while the middle 1310 ft has sparse vegetation either because of lack of water or narrowness of the gorge, at the upper W end the water is underground for about 492 ft. Dominant trees are Red Willow (*Salix laevigata*), Narrow-leaf Willow (*S. exigua*), and Screwbean Mesquite (*Prosopis pubescens*). Mule Fat (*Baccharis glutinosa*) forms narrow groves of understory throughout the plot. Squaw Waterweed (*B. sergiloides*) is present but rare. Arrowweed (*Pluchea sericea*) occurs primarily in the center of the plot where it is dominant. Cattail (*Typha domingensis*) is present in one area where the stream has been dammed. Ground cover is nearly absent in the lower half due to scouring from the stream and grazing by feral burros. The majority of the ground cover in the upper half is composed of Cooper's Rush (*Juncus cooperi*), it occurs in dense stands in three areas. Watercress (*Rorippa nasturtium-aquatica*), Stream Orchid (*Epipactis gigantea*), Paintbrush (*Castilleja minor*) and Salt Grass (*Distichlis spicata*) make up the other components of the ground cover. In a few areas Creosote Bush (*Larrea tridentata*) and Four-wing Saltbush (*Atriplex canescens*) occur in small clumps. Flash floods occur frequently in the gorge. There are several areas within the plot where feral burros have grazed or trampled vegetation from ground level to a height of 5 ft. A quantitative survey of the vegetation gave the following results: Trees, 3-in. diameter and over, based on a count of all trees 84/acre; total basal area, 282.3 ft<sup>2</sup>/acre (figures after each give number of trees/acre, relative density (%), relative dominance, in that sequence: Willow, both Red and Narrow-leaf 51, 61, 60; Screwbean Mesquite 33, 39, 40. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance, in that sequence): A (3-6 in.) 5, 6, 0.5, +; B (6-9 in.) 8, 10, 2.4, 1; C (9-15 in.) 18, 21, 14, 1, 5; D (15-21 in.) 17, 20, 30.1, 11; E (21-27 in.) 10, 12, 31, 4, 11; F (27-33 in.) 9, 11, 44.1, 16; G (33-40 in.) 6, 8, 43, 6, 15; H (> 40 in.) 11, 13, 116.1, 41. Tree species by diameter size class — Willow: A 3, 4, 0.3, +; B 4, 5, 1.2, +, C 12, 14, 9.4, 3; D 10, 12, 17.7, 6; E 7, 8, 22.0, 8; F 5, 6, 24.5, 9; G 3, 4, 21.8, 8; H 7, 8, 73.9, 26. Screwbean

Mesquite: A 2, 2, 0.2, +, B 4, 5, 1.2, +, C 6, 7, 4.7, 2, D 7, 8, 12.4, 4; E 3, 4, 9.4, 3; F 4, 5, 19.6, 3; G 3, 4, 21.8, 8, H 4, 5, 42.2, 15. Canopy cover, 80%; average canopy height, 11 ft. **Topography:** A narrow canyon wash with a stream flowing through it; gradually sloping downhill from W to E. **Elevation:** 2700 ft in the W to 2400 ft in the E. **Edge:** Steep canyon walls form N and S boundaries; E and W edges are formed by the end of riparian vegetation and beginning of a sparse Creosote Bush community.

**Weather:** Temperatures varied from 55-92°F. No precipitation was recorded during the census period. **Coverage:** April 6, 13, 20, 27; May 5, 19, 26, 31; 0545-0945. Total man-hours: 32. **Census:** Mourning Dove, 22 (601, 243); House Finch, 8 (219, 88); Costa's Hummingbird (males), 5 (137, 55); Blue-gray Gnatcatcher, 5, Hooded Oriole, 2; Black-headed Grosbeak, 2; Lesser Goldfinch, 2; Ash-throated Flycatcher, 1. **Total:** 8 species; 47 territorial males (1285/km<sup>2</sup>, 520/100 acres)

**Remarks:** The following nests were found: Mourning Dove, 4; Costa's Hummingbird, 2; Blue-gray Gnatcatcher, 3; Hooded Oriole, 1; House Finch, 2; Lesser Goldfinch, 1. A group of 10-20 feral burros used the plot regularly during the census period, and in the vicinity of the water course, caused erosion and scarring by trampling and wallowing; destruction of vegetation through heavy grazing and trampling can damage the rich flora and fauna of this riparian area. I thank Michael C Long for identification of some of the plants and a special thanks to the staff for their assistance and suggestions. The study was sponsored by the Bureau of Land Management, California Desert Plan Program. — *ROBERT L. MCKERNAN, 2620 N. 40th Street, Phoenix, Ariz 85008.*

**97. WILLOW-RIPARIAN I.** — **Location:** California, Inyo and Kern Cos., Sand Canyon, in S extension of the Sierra Nevada Mtns., 12 mi N on State Hwy. 14 from intersection of State Hwys. 178 and 14, then 3.5 mi W on Brown Rd.; from center of Sect. 7, T25S, R38E, up the canyon following the main stream approximately 1 4 mi, Little Lake Quadrangle, USGS; 35°47'N, 117°56'W. **Continuity:** New. **Size:** 2.3 ha = 5.7 acres. **Description of Plot:** Canyon bottom with constant running stream. Area sampled for birds was approximately 6.5-10 ft on each side of the stream. A dirt road follows the stream at varying distances all along the willow plot. Three intermittent streams and many gullies feed the stream after rains. Vegetation: A streamside community consisting of willows, cottonwoods and woody shrubs. The woody understory consists primarily of Willow (*Salix gooddingii*), Mule Fat (*Baccharis glutinosa*), Squaw Waterweed (*B. sergiloides*), Rabbit Brush (*Chrysothamnus nauseosus*, *C. viscidiflorus*, *C. teretifolius*), Four-wing Saltbush (*Atriplex canescens*), and California Grape (*Vitis californica*). Other shrubs are *Gnaphalium wrightii*, *Gutierrezia microcephala*, *Artemisia dracunculus*, *A. ludoviciana*, *Haplopappus linearifolius*, *Salvia dorrii*, *Salazaria mexicana*, *Lepidospartum squamatum*, *Zauschneria californica*, *Stephanomeria pauciflora*, *Penstemon fruticosus*, and *Solidago occidentalis*. A quantitative survey of the vegetation gave the following results: trees, 3-in. diameter and over, based on six 0.1-acre circle samples, 137.6/acre; total basal area, 62.6 ft<sup>2</sup>/acre. Species comprising the study plot (figure after each species gives number of trees/acre, relative density (%), relative dominance, and frequency in that order): Willow 112, 81, 79, 83; Cottonwood (*Populus fremontii*) 26, 19, 21, 33

Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, and relative dominance): A (3-6 in.) 75, 55, 8, 3, 13; B (6-9 in.) 30, 22, 9.3, 15; C (9-15 in.) 19, 14, 15.1, 24, D (15-21 in.) 10, 7, 17.0, 27; E (21-27 in.) 2, 1, 5.0, 8; F (27-33 in.) 2, 1, 7.8, 12. Tree species by diameter size class - Willow: A 66, 48, 6.5, 10; B 22, 16, 6.9, 11; C 14, 10, 11, 3, 18; D 6, 5, 11.3, 18; E 2, 1, 5.0, 8; F 2, 1, 7.8, 12. Cottonwood: A 10, 7, 1.1, 2; B 8, 6, 2.4, 4; C 5, 4, 3.8, 6; D 3, 2, 5.6, 9. Ground cover, 28%; canopy cover, 49%; average canopy height, 32.2 ft (range 8-55 ft). Livestock grazing is prevalent and has reduced vegetation in the understory, contributing to clearings within the willows and shrubs; cattle trails criss-cross the plot. Human use (campers) may also contribute to clearings and loss of cover. Litter of sticks and fallen woods is lacking and appears to have been collected for firewood. **Edge:** The long edges border on a variety of desert plant communities, most of which include a large amount of Burro-bush (*Ambrosia dumosa*). **Coverage:** April 16-17, 23; May 12, 19-20, 25-26; 0430-0830, PST. Total man-hours: 32. **Census:** Mourning Dove, 15 (650, 263); Lazuli Bunting, 9 (390, 158); Bewick's Wren, 8 (347, 140); Wilson's Warbler, 8; House Finch, 7 (303, 123); Costa's Hummingbird, 6 (260, 105); Brown Towhee, 6; Black-headed Grosbeak, 4 (173, 70); Scrub Jay, 3 (130, 53); Lesser Goldfinch, 3; Ash-throated Flycatcher, 2; Warbling Vireo, 2; W. Wood Pewee, 1. **Total:** 13 species; 74 territorial males (3208/km<sup>2</sup>, 1298/100 acres). **Remarks:** High density figures are to some extent an artifact of the sampling technique. While the area of willow habitat is only 5.7 acres, many birds nesting in the willows use adjacent habitats extensively. Thus the actual area of all habitats used by the birds breeding in the willows is probably 10 or 20 times greater than the area sampled for birds. Estimates of numbers of Mourning Doves and House Finches may be inaccurate due to the difficulties of determining breeding birds in contrast to those passing through. A Hermit Thrush may breed on the census area, although no positive evidence was found. Thrushes appeared to be regularly spaced along the stream and were repeatedly found in the same locations. A Brown-headed Cowbird probably reproduces in the area, but no actual cases of parasitism were recorded. Several species expected to breed here (Bell's Vireo, yellowthroat and Yellow-breasted Chat) apparently did not. This study was sponsored by the Bureau of Land Management, California Desert Program; they also provided the vegetation data. — CHARLES F. DOCK, 1164 W. Adams Blvd., Los Angeles, Calif. 90007.

**98. WILLOW RIPARIAN II.** — **Location:** California; Kern Co., Grapevine Canyon. The Grapevine Canyon road turns W off U.S. Hwy. 395 2 mi N of the junction of State Hwy. 14 and U.S. Hwy. 395; the plot begins 2.3 mi up the canyon road in the NW $\frac{1}{4}$  Sect. 29, T25S, R38E and ends in SW $\frac{1}{4}$  Sect. 19, T25S, R38E, Inyokern Quadrangle, USGS; 35°44'N, 117°55'W. **Continuity:** New. **Size:** 3.88 ha = 9.59 acres (rectangular, 1931 m long following streambed, paced; width ranges from 5 to 82 m, paced at 50 m intervals to give a mean of 20.1 m). **Description of Plot:** Begins at the old Los Angeles aqueduct in the canyon and ends at the last continuous section of cottonwoods. Water is present in five different sections totaling 2457 ft. None of the water is naturally on the surface but there are wells for the residents of the

canyon and artificial springs for the cattle. The stream is less than 1.6 ft in width in all sections and 0.4-2 in in depth. The riparian habitat varies greatly in width, canopy height, and composition. **Vegetation:** Willows and Cottonwoods are interspersed with White Alder and California Grape. The woody undergrowth consists of (listed in decreasing order of density): Arroyo Willow (*Salix lasiolepis*), California Grape (*Vitis girdiana*), Rabbit Bush (*Chrysothamnus nauseosus*), Broom Baccharis (*Baccharis sergiloides*), Four-wing Saltbush (*Atriplex canescens*), Cottonwood (*Populus fremontii*), White Alder (*Alnus rhombifolia*), Bladderpod (*Isomeris arborea*), Cheesebush (*Hymenoclea salsola*), Big Sagebrush (*Artemisia tridentata*), Desert Straw (*Stephanomeria pauciflora*), Burrobush (*Ambrosia dumosa*), Paper Bag Bush (*Salazaria mexicana*), Brickellia (*Brickellia californica*), Joshua Tree (*Yucca brevifolia*), and Flannel Bush (*Fremontodendron californicum*). Two tree species which were present but not sampled are: Black Walnut (*Juglans nigra*) and Digger Pine (*Pinus sabiniana*). Herbaceous plants are represented by Wire Grass (*Juncus mexicanus*), Salt Grass (*Distichlis spicata*), Beard Grass (*Polygonum monospeliensis*), Foxtail (*Bromus rubens*), Tule Grass (*Scirpus cernuus*) and Needle Grass (*Stipa speciosus*). A quantitative survey of the vegetation gave the following results: Trees, 3 in. diameter and over based on sixteen 0.1 acre circular samples, 229/acre, total basal area, 73.3 ft<sup>2</sup>/acre. Species comprising the study plot (figures after each give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance, in that sequence): Arroyo Willow 97, 42, 26, 94; Cottonwood 79, 35, 40, 88; White Alder 46, 20, 34, 50; California Grape 7, 3, 1, 6. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance, in that sequence): A (3-6 in.) 125, 54, 12, 3, 16; B (6-9 in.) 57, 25, 16.6, 22; C (9-15 in.) 37, 16, 29, 5, 38; D (15-21 in.) 9, 4, 16.8, 22; E (21-27 in.) 1, +, 1, 2, 3. Tree species by diameter size class - Arroyo Willow A 71, 31, 6.9, 9; B 18, 8, 5.2, 7; C 7, 3, 5.5, 7; D 1, +, 2, 2, 3, Cottonwood: A 36, 16, 3.6, 5; B 21, 9, 6.2, 8; C 19, 8, 15.5, 20; D 2, 1, 3.4, 4; E 1, +, 1.9, 2; White Alder: A 11, 5, 1.1, 1; B 18, 8, 5.2, 7; C 11, 5, 8.5, 11; D 6, 3, 11.2, 14, California Grape: A 7, 3, 0.7, 1. Ground Cover, 37%; canopy cover, 63%; average canopy height, 41.3 ft (range 16-68). Cattle can get to the streambed in three separate sections totaling 2356 ft, 607 ft of which has water in the bed. In these areas the undergrowth has been trampled and except for a few grapes, the shrubs have been destroyed. One resident lives in the census area during the winter months. **Edge:** The riparian habitat is surrounded primarily by a Rabbit Brush – Four-wing Saltbush community in the lower half, and a Rabbit Brush – California Grape community in the upper half, and Big Sagebrush only in the upper 262 ft of the plot. **Topography:** Slightly sloping W to E from an elevation of 3500-3150 ft. The creekbed is within 225 ft of the mountain slopes on the N side of the canyon and within 600 ft on the S side. The plot follows the N fork of the creek. **Weather:** Temperatures, 48-84°F. One-tenth inch of rain fell during one census day; winds, 0-20 mph. **Coverage:** April 3, 5, 7-9; May 24-26, 28, 30; June 1, 5; 0530-1200 and 1830-2215, PST. Total man-hours: 53. **Census:** California Quail, 18 (464, 188); House Finch, 14 (361, 146); Lesser Goldfinch, 11 (283, 115); Bewick's Wren, 4 (103, 42); Brown Towhee, 4; Mourning Dove, 2; Costa's

Hummingbird, 2; Anna's Hummingbird, 2; Starling, 2; N Oriole, 2; Great Horned Owl, 1; Rufous Hummingbird, 1; Ladder-backed Woodpecker, 1; Scrub Jay, 1; Plain Titmouse, 1; W. Bluebird, 1; Com. Yellowthroat, 1; Yellow-breasted Chat, 1; Lawrence's Goldfinch, 1; Rufous-sided Towhee, 1. **Total:** 20 species; 71 territorial males ( $1829/\text{km}^2$ ,  $740/100 \text{ acres}$ ). **Remarks:** Nests found include Mourning Dove, 2; Anna's Hummingbird, 2; House Finch, 1; and Rufous-sided Towhee, 1. Seven coveys of immature California Quail were observed. The visiting *Empidonax* flycatchers, W. Wood Pewee, and Wilson's Warblers might be breeding here but neither nesting behavior nor nests were observed. Several species nesting around the riparian habitat on the mountain slopes that may or may not forage in or over the riparian habitat are: Turkey Vulture, Red-tailed Hawk, Roadrunner, Poor-will, Com. Raven, Rock Wren, Loggerhead Shrike, Sage Sparrow, and Black-throated Sparrow. Densities of California Quail may be inaccurate because of difficulty differentiating birds nesting in the riparian from those just feeding or roosting there. The high density of California Quail may be a result of minimum of hunting pressures on this private land. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — **PETER WOODMAN, 1825 Weiman, Ridgecrest, Calif. 93555.**

**99. OPEN ASPEN GROVE - SCATTERED CONIFERS.** — **Location:** Colorado; Larimer Co., Rocky Mountain National Park, NE  $\frac{1}{4}$  Sect. 31, T5N, R73W;  $40^\circ 22'N$ ,  $105^\circ 37'W$ , Longs Peak Quadrangle, USGS. **Continuity:** Established 1976. **Size:** 14 ha = 34.6 acres. **Description of Plot:** See AB 31:72-73. **Weather:** One of the driest Springs on record. Snowpack 40% of normal; 100 mph wind during the second week in May blew down many good nesting trees. **Coverage:** April 29; May 7, 21-22, June 4, 11-12, 18, 25; 0530-1100. Total man-hours: 22. **Census:** House Wren, 11 (79, 32); Tree Swallow, 7 (50, 20); Mountain Bluebird, 4 (29, 12); Warbling Vireo, 4; Dusky Flycatcher, 3 (21, 9); Pygmy Nuthatch, 3; Am. Robin, 3; Gray-headed Junco, 3; Broad-tailed Hummingbird, 2.5; Williamson's Sapsucker, 2.5; Com. Flicker, 2; W. Wood Pewee, 2; Mountain Chickadee, 2; Chipping Sparrow, 2; Hairy Woodpecker, 1.5; Green-tailed Towhee, 1.5; Yellow-bellied Sapsucker, 1; Downy Woodpecker, 1; Olive-sided Flycatcher, 1; White-breasted Nuthatch, 1; Yellow-rumped Warbler, 1; Brown-headed Cowbird, 1; W. Tanager, 1; Cassin's Finch, 1; Evening Grosbeak, 0.5; Goshawk, +; Steller's Jay, +; Black-billed Magpie, +; Com. Raven, +; Com. Crow, +; Brown Creeper, +; Rock Wren, +; Townsend's Solitaire, +; Ruby-crowned Kinglet, +; Am. Goldfinch, +; Pine Siskin, +; Red Crossbill, +. **Total:** 37 species; 62.5 territorial males or females ( $446/\text{km}^2$ ,  $181/100 \text{ acres}$ ). **Remarks:** 26 active nests located: Tree Swallow, 7; House Wren, 4; Mountain Bluebird, 4; Williamson's Sapsucker, 2; Mountain Chickadee, 2; Pygmy Nuthatch, 2; Com. Flicker, 1; Yellow-bellied Sapsucker, 1; W. Wood Pewee, 1; White-breasted Nuthatch, 1; and Warbling Vireo, 1. — **PAULA L. HANSLEY, 3192 4th, Boulder, Colo. 80302.**

**100. PONDEROSA PINE - SCRUB OAK - MAHOGANY WOODLAND.** — **Location:** Colorado; Douglas Co., 1 mi E of Franktown, on Highway #86;  $39^\circ 20'N$ ,  $104^\circ 40'W$ , Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 10 consecutive years. **Size:** 8.09 ha

= 20 acres. **Weather:** Extremely dry during spring and first part of summer. **Coverage:** June 7, 13, 22, 28; July 6, 14, 22, 29; August 8, 17, 26; 0800-2030. Total man-hours: 43. **Census:** W. Bluebird, 12 (148, 60); W. Wood Pewee, 3 (37, 15); Broad-tailed Hummingbird, 2; Black-headed Grosbeak, 2; Lesser Goldfinch, 2; Rufous-sided Towhee, 2; Cooper's Hawk, 1; White-breasted Nuthatch, 1; House Wren, 1; Solitary Vireo, 1; Virginia's Warbler, 1; Brown-headed Cowbird (female), 1; W. Tanager, 1; Lark Sparrow, 1. **Total:** 14 species; 31 territorial males or females ( $383/\text{km}^2$ ,  $155/100 \text{ acres}$ ). **Visitors:** Mourning Dove, Rufous Hummingbird, Com. Flicker, Hairy Woodpecker, Steller's Jay, Scrub Jay, Com. Crow, Black-capped Chickadee, Mountain Chickadee, Pygmy Nuthatch, Am. Robin, House Finch, Chipping Sparrow, Brewer's Sparrow. **Remarks:** There were 13 box-nests White-breasted Nuthatch, 1; W. Bluebird, 12; 3 other nests were found: Cooper's Hawk, 1; Solitary Vireo, 1 (with one Brown-headed Cowbird egg); Lark Sparrow, 1 (fledged 2 young). The White-breasted Nuthatch fledged 6 young. This was only a fair year for the W. Bluebirds, only 56 eggs compared to 79 in 1976, but survival was good, 29 fledged, only 2 were infertile; predators got at 7 boxes. Bluebirds nested later this year, perhaps because it was so very dry, consequently few wild flowers and fewer insects. — **MILDRED O. SNYDER, 161 Del Mar Circle, Aurora, Colo. 80011.**

**101. CALIFORNIA-BAY - BISHOP PINE - MIXED FOREST.** — **Location:** California; Marin Co., 0.5 mi S of Inverness;  $38^\circ 03'N$ ,  $122^\circ 50'W$ , Inverness Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 11.7 ha = 29 acres. **Description of Plot:** See AB 26:981 (1972). **Weather:** See Census 106. **Coverage:** March 31; April 14, 18-19, 28; May 25; June 9; 0600-1200. Total man-hours: 21. **Census:** Wilson's Warbler, 8 (68, 28); Purple Finch, 7 (60, 24); Chestnut-backed Chickadee, 6 (51, 21); Pine Siskin, 6; Com. Bushtit, 5 (43, 17); Brown Creeper, 5; Hutton's Vireo, 4 (34, 14); Rufous-sided Towhee, 4; Western Flycatcher, 3.5 (30, 12); Orange-crowned Warbler, 3.5; Winter Wren, 3 (26, 10); Steller's Jay, 2; Pygmy Nuthatch, 2; Wrentit, 2; Swainson's Thrush, 2; Golden-crowned Kinglet, 2; Acorn Woodpecker, 1; Hairy Woodpecker, 1; Hermit Thrush, 1; Am. Goldfinch, 1; Dark-eyed Junco, 1; Song Sparrow, 1; Turkey Vulture, +; Allen's Hummingbird, +; Downy Woodpecker, +; Com. Raven, +; Warbling Vireo, +. **Total:** 26 species; 71 territorial males ( $605/\text{km}^2$ ,  $245/100 \text{ acres}$ ). **Remarks:** Despite very dry winters in 1975-76 and 1976-77 there has not been an appreciable decline of males per 100 acres in 1976 (241) and 1977 (245) breeding seasons compared to 1975 (252). Nests found: Pygmy Nuthatch, 2; Brown Creeper, 2; Bushtit, 1; Chestnut-backed Chickadee, 1; and Winter Wren, 1 Contribution No. 149, PRBO. — **ROBERT M STEWART, PRBO, 4990 Shoreline Highway, Stinson Beach, Calif. 94970.**

**102. DOUGLAS-FIR - OAK - MIXED EVERGREEN FOREST.** — **Location:** California; Mendocino Co.; along Elder Creek on the Nature Conservancy's N California Coast Range Preserve 5.5 mi N of Branscomb,  $39^\circ 44'N$ ,  $123^\circ 38'W$ , Lincoln Ridge Quadrangle, USGS. **Continuity:** New. **Size:** 7.89 ha = 19.5 acres (irregular, approximately a rectangle, paced with compass) **Description of Plot:** Mixed evergreen forest clothing the

lower canyon of Elder Creek. Most of the plot (96%) is densely wooded, but forest structure and species composition vary markedly. This reflects the situation throughout the Elder Creek watershed and the North Coast Ranges generally. Through examination of aerial photographs four forest cover types could be delineated: (I) Douglas Fir (*Pseudotsuga menziesii*) dominant - 42%, (II) Douglas-fir and Oregon Oak (*Quercus garryana*), Interior Live Oak (*Q. wislizenii*) and/or Madrone (*Arbutus menziesii*) dominant - 15%, (III) Oregon Oak, Interior Live Oak and/or Madrone dominant, Douglas-fir sparse or lacking - 33%, and (IV) Bigleaf Maple (*Acer macrophyllum*), White Alder (*Alnus rhombifolia*), and California Bay (*Umbellularia californica*) dominant - 6%. Type I forest, characterized by large (average dbh 16 in.) Douglas-firs, is best developed on north-facing slopes along the S perimeter. The trees form a more or less closed canopy 70 to 130 ft in height. Herbaceous ground cover, primarily grasses, is relatively dense, but understory shrubs are sparse or lacking. Type II forest is characterized by scattered, medium-sized Douglas-firs with an admixture of oaks and/or Madrones. Typically scattered tall firs overlap a dense canopy of hardwoods and smaller firs 30-50 ft in height. Saplings and scattered shrubs, such as Coffeeberry (*Rhamnus californica*), Hazelnut (*Corylus cornuta* var. *californica*), and Poison Oak (*Rhus diversiloba*), form an open woody understory. Herbaceous ground cover is sparse. Type III forest includes (a) park-like groves of Oregon Oak and (b) dense shrub forest of Interior Live Oak and/or Madrone. The Oregon Oaks, which grow on creek-cut, relatively level terraces, form an open canopy about 30 ft high that permits more light penetration than any other forest type. For this reason, perhaps, a lush herbaceous understory, primarily Bear Grass (*Xerophyllum tenax*), flourishes under the trees. Interior Live Oaks and/or Madrones form dense, low canopy (10-30 ft) shrub forests on the relatively steep, south-facing slopes below the ridge along the N boundary. Type IV forest consists of water-loving trees, such as White Alder, Big-leaf Maple, California Bay and Yew (*Taxus brevifolia*), which depend on the high water table in the vicinity of Elder Creek; typically a few Douglas-firs and oaks are intermixed. Snags and down timber are scattered throughout the plot. Forbs, grasses, sedges and ferns are scattered along Elder Creek. Forest cover is interrupted by openings (1) along Elder Creek, both by the creekbed itself and by steep, sparsely vegetated streamcuts and washouts scattered along its course, (2) Wilderness Lodge Road, a narrow dirt road that defines the NW boundary, (3) a small meadow (grasses and forbs less than 1 ft in height) on the NW corner (2% of total area), and (4) a shrubby clearing at the SE corner (2% of total area). This clearing, is partially covered by dense, more or less continuous thickets of W Choke Cherry (*Prunus virginiana* var. *demissa*) 6-20 ft in height (45%) and by a single, very large Whitethorn (*Ceanothus incanus*) 10 ft in height (5%). A profuse tangle of dead stems underlays the foliage. The remainder of the clearing is covered with grasses, scattered thistle (*Cirsium*) and mullein (*Verbascum*), and down trunks and branches. A quantitative survey of the forest vegetation based on 10 more or less evenly spaced 0.01 ha square plots yielded the following data: Trees 3-in. dbh and over 344/acre; total basal area 210 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees 3-in. dbh and over (figures after each give number

of trees/acre, relative density (%), relative dominance (%), frequency (%), maximum height (ft), in that sequence: Douglas-fir 100, 29, 41, 80, 130; Interior Live Oak 96, 28, 25, 40, 50; Oregon Oak 40, 12, 7, 30, 40, snags 32, 9, 12, 30, 130; Oregon Ash (*Fraxinus latifolia*), 20, 6, 1, 30, 40; California-Bay 16, 5, 2, 20, 60; Madrone 12, 3, 1, 10, 30; Big-leaf Maple 12, 3, 4, 10, 40; White Alder 8, 2, 2, 10, 50; Yew 8, 2, 3, 10, 30. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance (%), in that sequence): A (3-6 in.) 104, 30, 10, 5; B (6-9 in.) 116, 34, 35, 17; C (9-15 in.) 64, 19, 51, 24; D (15-21 in.) 56, 16, 101, 48; E (21-27 in.) 4, 1, 12, 6. Trees 3-in. dbh and over by height class (figures after each class give number of trees/acre, relative density (%), frequency (%)): A (3-7 ft) 12, 3; B (17-33 ft) 148, 42; C (33-50 ft) 124, 35; D (over 50 ft) 72, 20. Shrub and sapling stems less than 3-in. dbh 584/acre. Species comprising 100% of the total number of shrubs and saplings (figures after each species give number of stems/acre, relative density (%), frequency (%)): Interior Live Oak 220, 38, 40; Hazelnut 116, 20, 10; Douglas-fir 100, 17, 80; California-Bay 36, 6, 20; Manzanita (*Arctostaphylos* spp.) 32, 5, 10; Serviceberry (*Amelanchier pallida*) 32, 5, 10; Coffeeberry 20, 3, 20; snags 16, 3, 10; Cream-bush (*Holodiscus discolor*) 4, 1, 10; Canyon Oak (*Q. chrysolepis*) 4, 1, 10. Average herbaceous ground cover 30% (range 0-100). Average canopy cover 84% (range 50-100). Average canopy height 60 ft (range 30-130). **Edge:** Surrounding vegetation generally reflects the diversity of forest types found within the plot. Along the S boundary, however some Douglas-firs exceed in size any measured on the plot. The largest are 80 in. dbh. **Topography:** A steep V-shaped canyon with creek-cut terraces; Elder Creek drains in a generally E to W direction. **Elevation:** 1430-1670 ft. **Weather:** Dry, second year of drought. Last year's rainfall was 66% of average; this year's was 35% of average (86 in.). High temperatures during May averaged 62°F (80° below average), and were near average during remainder of period. **Coverage:** April 8-11, 18, 21-23, 26-27, 29; May 5, 7, 17, 24-25, 27, 29, 31; June 6-7, 16-17, 29-30; July 1, 5, 14, 19, 26; August 3-4; 0600-1200, PDT Total man-hours: 90. **Census:** Dark-eyed Junco, 7.5 (95, 38); Solitary Vireo, 7 (89, 36); W. Flycatcher, 6.5 (82, 33); Warbling Vireo, 5.5 (70, 28); Black-headed Grosbeak, 4 (51, 21); Black-throated Gray Warbler, 3.5 (44, 18); Chestnut-backed Chickadee, 3 (38, 15); Steller's Jay, 3, Brown Creeper, 2; Hutton's Vireo, 2; Hermit Warbler, 2; W. Tanager, 2; Hairy Woodpecker, 1; Am. Robin, 1; Red-breasted Nuthatch, 1; Com. Bushtit, 1; Rufous-sided Towhee, 1; Goshawk, 0.5; Com. Flicker, +; Hermit Thrush, +; Pine Siskin, +. **Total:** 21 species; 53.5 territorial males (678/km<sup>2</sup>, 274/100 acres). **Remarks:** Density and diversity of nesting birds was markedly higher in the vicinity of the meadow than elsewhere; 16 territorial males of 13 species had territories including and/or bordering on this shrubby clearing; a density of 3 times higher than that for the plot as a whole. This correlates with the relatively high diversity of plant species and forest types surrounding this clearing: Douglas-fir to the S, mixed fir and Oregon Oak to the W, Live Oak and Madrone to the N, fir and Madrone to the E. Conversely, type IIIb Live Oak-Madrone shrub forest supported only 5 territorial males of 5 species, a density approximately 1/3 that of the plot as a whole. Extensive rooting by feral pigs may have adversely affected nesting of ground-

nesting birds. Thanks to Steve Johnson for the vegetation data and encouragement. This and all succeeding censuses on this plot are dedicated to Heath Angelo, whose love for this forest gave birth to the Coast Range Preserve. — *GREG GRANTHAM, DAVID GAINES* (compiler) and *SALLY JUDY*, Box 33, Branscomb, Calif. 95417.

**103. PONDEROSA PINE FOREST.** — **Location:** Colorado; Boulder Co., in the lower foothills 0.5 mi S of Baseline Road, Boulder, E part of Sect. 1, TIS, R71W, 6th Principal Meridian. **Continuity:** Established 1954; 14 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 8:372 (1954). **Weather:** A dry and hot spring and summer. **Coverage:** April 24; May 9, 14, 22, 29, June 2, 5, 12, 19, 26; July 3, 10, 27; 0700-1540. Total man-hours: 15. **Census:** W. Wood Pewee, 6 (74, 30); Chipping Sparrow, 6; Solitary Vireo, 5 (62, 25); Mourning Dove, 4 (49, 20); Pygmy Nuthatch, 4; Am. Robin, 4; W. Tanager, 3 (37, 15); Broad-tailed Hummingbird, 2; Lesser Goldfinch, 2; Com. Flicker, 1; White-breasted Nuthatch, 1. **Total:** 11 species; 38 territorial males or females (469/km<sup>2</sup>, 190/100 acres). **Remarks:** The population was the lowest in several years. Steller's Jay, Mountain Chickadee, House Wren, Black-headed Grosbeak, Pine Siskin, and Gray-headed Junco did not nest. Thanks to Karen Nickey and Ellen Valentine. — *LOUISE HERING*, 568 Marine Street, Boulder, Colo. 80302.

**104. PINYON-JUNIPER-PONDEROSA PINE ECOTONE.** — **Location:** New Mexico; McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; SE<sup>1/4</sup>, Sec. 34, T13N, R13W; 35°19'N, 108°12'W, Pine Canyon Quadrangle, USGS. **Continuity:** New. **Size:** 36.9 ha = acres (polygonal, gridded with steel tape and Brunton compass). **Description of Plot:** Five randomly located 15 x 25 m plots were used for analysis of vegetation. Within each plot trees over 1 m in height were counted and their dbh recorded. Trees less than 1 m in height were counted in two 25 x 1 m strips in each plot. Ground cover was assessed in 50, 2 x 5 dm sub-plots in each plot. Canopy cover was assessed at one point within each sub-plot. Trees greater than 1 m in height, 752/ha; total basal area, 1498 dm<sup>2</sup>/ha (65.5 ft<sup>2</sup>/acre); trees less than 1 m in height (*i.e.* reproduction), 1200/ha; number of trees less than 1 m in height/ha, number of trees greater than 1 m in height/ha, basal area (dm<sup>2</sup>/ha), absolute coverage (%), frequency (%) (in that order) of tree species: Colorado Pinyon (*Pinus edulis*), 1120, 704, 1442, 38, 100; One-seed Juniper (*Juniperus monosperma*), 40, 27, 32, 1.6, 80; Rocky Mountain Juniper (*J. scopulorum*), 40, 21, 27, 0.4, 60. Size classes of trees, followed by numbers/ha, relative density (%), basal area (dm<sup>2</sup>/ha), relative dominance (%) (based on basal area): A (0-0.5 dm), 331, 44, 16, 1; B (0.5-1.0 dm), 112, 15, 49, 3; C (1.0-2.0 dm), 197, 26, 348, 23, D (2.0-3.0 dm), 48, 6, 236, 16; E (3.0-4.0 dm), 27, 4, 260, 17; F (4.0-5.0 dm), 37, 5, 588, 39. Ground cover (%): bare ground, 44.2; rocks, 3.5; litter 42.3; lichens 2.1; shrubs Horse-brush (*Tetradymia canescens*), Rabbit-brush (*Chrysothamnus nauseosus*), and Snake-weed (*Gutierrezia Sarothrae*), 0.9; Blue Grama (*Bouteloua gracilis*), 8.0; herbs, 2.3. Ponderosa Pine (*P. ponderosa*), Gambel Oak (*Quercus gambelii*), and Wavyleaf Oak (*Q. undulata*) are found, but were not encountered in the plots. The area was logged for *ponderosa* about 50 years ago, but has not been disturbed since. Numerous snags

of this species remain, and dense stands of young trees exist where conditions are favorable, notably on slopes. There are five rustic two-man cabins on the NW edge. Disturbance in their vicinity is minimal and probably has no effect on breeding success. **Edge:** Similar vegetation, except the N end, which approaches the natural boundary between woodland and grassland. **Topography:** Flat mesa tops and gentle slopes. **Elevation:** 7520-7620 ft (2292-2323 m). **Weather:** See Census 113. **Coverage:** May 30; June 3, 6-7, 22, 26; July 1, 4-6, 8-10, 12, 14, 18, 20, August 3; 0530-2000, MDT. Total man-hours: 32. **Census:** Violet-green Swallow, 11 (30, 12); Gray Flycatcher, 7 (19, 8); Mourning Dove, 5.5 (15, 6); Mountain Chickadee, 5.5; W. Bluebird, 5.5; Pygmy Nuthatch, 4 (11, 4); Solitary Vireo, 4; Chipping Sparrow, 4; Plain Titmouse, 3 (8, 3); White-breasted Nuthatch, 3; Black-throated Gray Warbler, 2.5; Ash-throated Flycatcher, 2; Brown-headed Cowbird, 2; Com. Nighthawk, 1; Hairy Woodpecker, 1; W. Wood Pewee, 1; Steller's Jay, 1; Scrub Jay, 1; Mountain Bluebird, 1. **Total:** 19 species; 65 territorial males or females (176/km<sup>2</sup>, 71/100 acres). **Visitors:** Goshawk, Am. Kestrel, Great Horned Owl, Broad-tailed Hummingbird, Yellow-bellied Sapsucker, Williamson's Sapsucker, Pinyon Jay, Com. Raven, Com. Bushtit, Bewick's Wren, Am. Robin, W. Tanager, House Finch, Lesser Goldfinch, Red Crossbill, Gray-headed Junco. **Remarks:** 11 nests found: W. Bluebird and Solitary Vireo, 2 each; Mourning Dove, Com. Nighthawk, Violet-green Swallow, Mountain Chickadee, White-breasted Nuthatch, Pygmy Nuthatch, and Mountain Bluebird, 1 each. We thank C. Grimm, K. Lee, M. Barbehenn, P. Broder, L. Chaffee, and R. Vonnegut for assisting with the census. — *D. ARCHIBALD McCALLUM, SUSAN R. BUCHSBAUM, and JENNIFER J PRICE*, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323.

**105. WHITE FIR - DOUGLAS-FIR FOREST.** — **Location:** Utah; Kane Co., 2.4 km N of Rainbow Point, 1.2 km down the Yovimpa fire road; 37°28'N, 112°15'W, Bryce Canyon Nat'l Park Quadrangle, USGS. **Continuity:** New. **Size:** 60 ha = 148.26 acres (rectangular, 600 x 1000 m, paced). **Description of Plot:** Forest crown considerably closed with very little understory growth, sparse herbaceous ground cover. The plot was relatively flat with one narrow gulley running W through the middle, causing a drop of 50 m in elevation, in 100 m, rising back up to the same elevation on both sides. This narrow gulley showed no difference in vegetation in comparison to the rest of the plot. For 50 m around, the surrounding vegetation was similar. The fir forest is climax in elevations of 2813 at Bryce Canyon National Park. The dominant canopy trees are White Fir (*Abies concolor*), Ponderosa Pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*). Most prominent ground cover is Greenleaf Manzanita (*Arctostaphylos patula*), and Mountain Lilac (*Ceanothus martinii*). There is no understory besides a few tree seedlings. A quantitative survey of the vegetation gave the following results. Trees 3-in. diameter and over, based on five circular samples, 156/acre; total basal area 288 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: White Fir 53, 77, 80; Ponderosa Pine 22, 13, 53, Douglas-fir 18, 9, 46; Limber Pine (*P. flexilis*) 7, 2, 20. Trees by diameter size class: A (3-6 in.) 41, 12, 13.2 10; B (6-9 in.) 72, 18, 29.2, 20; C (9-15 in.) 75, 35, 47, 46, D (15-21 in.) 36, 17, 53.9, 14; E (21-27 in.) 8, 2, 24, 2. Shrub stems/acre, 7,750; ground cover 39%; canopy cover 78%,

average canopy height 10 m (range 6-18 m) **Edge:** Bordered on all sides by similar forest. **Topography:** < 10% slope. **Elevation:** 8606-8806 ft (2623-2684 m). **Weather:** Clear, cool; rain periodically throughout period. **Coverage:** June 10, 12, 16-17, 22-23, 30; July 7, 9, 14, 21, 28; dawn-1130 or 1800-2100. Total man-hours: 48. **Census:** Hermit Thrush, 19 (32, 13); Mountain Chickadee, 17 (28, 11), Yellow-rumped Warbler, 12 (20, 8), Gray-headed Junco, 11 (18, 7); Cassin's Finch, 5 (8, 3); Hairy Woodpecker, 4 (7, 3); White-breasted Nuthatch, 2; Townsend's Solitaire, 2; W. Tanager, 2; Com. Flicker, 1; Williamson's Sapsucker, 1; Great Horned Owl, +; Say's Phoebe, + **Total:** 17 species; 80 territorial males or females (133/km<sup>2</sup>, 54/100 acres). **Visitors:** White-throated Swift, Rufous Hummingbird, Violet-green Swallow, Am. Robin, Ruby-crowned Kinglet, Red Crossbill. **Remarks:** Four nests were located: Hermit Thrush, 1 with four eggs, Gray-headed Junco, 1 with four eggs; Williamson's Sapsucker, 1; W. Tanager, 1 with three eggs. The Hermit Thrush seemed to be abundant this year. All nesting seemed late because of the cold spring and drought. Special thanks to George and Kirk Creighton, Brooke Feeley, John Kittelson, Pat Stutleberg, and Steve Mueller for assistance in bird observations, and Bryce Canyon Nat'l Park for permission to do the census — *JEFF CONNOR, Bard College, Annandale-on-Hudson, N.Y. 12504.*

**106. BISHOP PINE FOREST.** — **Location:** California, Marin Co., 3.75 mi WNW of Inverness; 38°37'N, 122°53'W, Drakes Bay Quadrangle, USGS. **Continuity:** Established 1952 (1951) as Coastal Closed-cone Pine Forest, 8 intermittent years. **Size:** 10.5 ha = 26 acres. **Description of Plot:** See AB 26:986 (1972). **Weather:** For the second winter in a row central California had less than half its normal rainfall. Rainfall 15 mi S of the plot totaled 15.91 in. during winter and spring 1976-77; the previous year had 17.61 in. (9-year average, 1966-1975, 37.33 in.). **Coverage:** March 30; April 13, 20; May 6, 17; 0630-1130. Total man-hours: 23. **Census:** Wrentit, 10 (95, 39); Pine Siskin, 10; Wilson's Warbler, 6.5 (62, 25); Dark-eyed Junco, 4.5 (43, 17); W. Flycatcher, 4 (38, 15); Chestnut-backed Chickadee, 3.5 (33, 13); Pygmy Nuthatch, 3 (29, 12); Winter Wren, 3; Purple Finch, 3; Rufous-sided Towhee, 3; Bewick's Wren, 2.5; Brown Creeper, 2; Hutton's Vireo, 2; Mourning Dove, 1; Hairy Woodpecker, 1; Steller's Jay, 1; Com. Bushtit, 1; Am. Robin, 1; White-crowned Sparrow, 1; Song Sparrow, 1; Violet-green Swallow, 0.5; California Quail, +; Com. Flicker, +; Olive-sided Flycatcher, +; Am. Goldfinch, +. **Total:** 25 species; 64.5 territorial males (613/km<sup>2</sup>, 248/100 acres) **Remarks:** A very definite decrease in numbers of breeding birds occurred in 1977 (248/100 acres compared to the 1972-75 average of 388.5/100 acres). Of the top 12 species in 1977 only the Wrentit and the Pine Siskin were estimated to be above the 1972-75 average; the other ten species were all estimated below the previous average. It is tempting to suggest that the 2-year drought in central California may have played some part in this decline. Nests found: Pygmy Nuthatch, 3; Chestnut-backed Chickadee, 1. Contribution No. 150 PRBO. — *ROBERT M. STEWART, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, Calif. 94970.*

**107. DISTURBED BISHOP PINE FOREST.** — **Location:** California; Marin Co., Inverness Ridge, Point Reyes Nat'l Seashore, 3 mi NW of Inverness Park; 38°

04'N, 122°51'W, Inverness Quadrangle, USGS. **Continuity:** Established 1972; 5 intermittent years. **Size:** 12.0 ha = 29.7 acres. **Description of Plot:** See AB 26:984-985 (1972). Since 1972 there has been an apparent increase in the height and density of the understory, especially of Salal (*Gaultheria shallon*) and California Huckleberry (*Vaccinium ovatum*). This plot supports a relatively large stand of Mount Vision Ceanothus (*Ceanothus gloriosus* var. *porrectus*), a low spreading shrub restricted to this ridge, included on the Smithsonian and California lists of threatened plant species. **Weather:** Despite a continuation of the drought, there were 5 days of fog or light rain during censusing; 3 days were clear. Wind hampered censusing on 1 foggy day and 1 clear day. **Coverage:** April 6, 13, 20; May 1, 11, 18, 25; June 17; 0600-1100 Total man-hours: 26. **Census:** Wrentit, 23 (191, 77); Allen's Hummingbird, 11 (92, 37); Wilson's Warbler, 8.5 (71, 29); Rufous-sided Towhee, 7 (58, 24); Bewick's Wren, 6.5 (54, 22); Western Flycatcher, 6; Chestnut-backed Chickadee, 6; Pygmy Nuthatch, 6 (50, 20); Pine Siskin, 6; Purple Finch, 6; Swainson's Thrush, 5.5 (46, 19); Violet-green Swallow, 3; Com. Bushtit, 3; Brown Creeper, 3; Hutton's Vireo, 3; Hairy Woodpecker, 2; Steller's Jay, 2; Orange-crowned Warbler, 2; Oregon Junco, 1.5; Anna's Hummingbird, 0.5; Red-tailed Hawk, +; Band-tailed Pigeon, +; Mourning Dove, +; Red-shafted Flicker, +; Winter Wren, +; Song Sparrow, +. **Total:** 26 species; 111.5 breeding males (928/km<sup>2</sup>, 375/100 acres). **Remarks:** Nests found, 2: Chestnut-backed Chickadee, Wrentit. Red Crossbills were seen and/or heard flying over the plot on 6 mornings; they are rare nesters on this ridge, but probably regular. Contribution number 157, PRBO. — *BRUCE A. SORRIE, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, Calif. 94970.*

**108. LIMBER PINE FOREST.** — **Location:** California; Inyo Co., SE of New York Butte, about 7.5 airmiles NE of Lone Pine. The study plot consists of two tracts Tract 1 (N section) begins in the SW $\frac{1}{4}$  Sec. 11, T15S, R37E, and ends in NW $\frac{1}{4}$  Sec. 11, T15S, R37E, and tract 2 (S section) is entirely in SE $\frac{1}{4}$  Sec. 11, T15S, R37E, New York Butte Quadrangle, USGS (unsurveyed); 36°39'N, 117°56'W. **Continuity:** New. **Size:** Tract 1: 15.2 ha = 37.5 acres (407 x 242 x 417 x 542 m, paced). Tract 2: 5.8 ha = 14.3 acres (251 x 318 x 174 x 252 m, paced) for a total of 21.0 ha = 51.8 acres. **Description of Plot:** The plot is divided into two tracts by a steep, barren, rocky area, and a wash consisting primarily of Mountain Mahogany approximately 492 ft wide. **Vegetation:** Limber Pine interspersed with small numbers of Bristlecone Pine and Mountain Mahogany. The vegetation throughout both plots is relatively constant with the exception of the relative densities of both pine species. A quantitative survey of the vegetation gave the following results: Trees, 3-in. diameter and over based on ten 0.1 acre circular samples, 113/acre; total basal area, 73.3 ft<sup>2</sup>/acre. Species comprising the study plot (figures after each give number of trees/acre, relative density (%), relative dominance, and frequency, in that sequence): Limber Pine (*Pinus flexilis*) 96, 85, 73, 90; Bristlecone Pine (*P. aristata*) 9, 8, 25, 30; and Mountain Mahogany (*Cercocarpus ledifolius*) 8, 7, 2, 10. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance, in that sequence); A (3-6 in.) 35, 31, 3.5, 5; B (6-9 in.) 31, 27, 9, 3, 13; C (9-15 in.) 33, 30, 26, 4, 36, D (15-21 in.) 13, 12, 27, 0.

37, G (33-40 in) 1, 1, 7 1, 10 Tree species by diameter size class - Limber Pine: A 28, 25, 2.8, 4; B 29, 26, 8.7, 12, C 28, 25, 22.4, 30; D 11, 10, 19.8, 27. Bristlecone Pine: A 1, 1, 0.1, +; C 5, 4, 4.0, 5; D 2, 2, 7.2, 10; G 1, 1, 7 1, 10. Mountain Mahogany: A 6, 5, 0.6, 1; B 2, 2, 0.6, 1. Ground cover, 16%; canopy cover, 40%; average canopy height, 39.5 ft (range 20-52). There is no permanent water in the plot. A campsite, on the saddle between the two tracts where a road ends, is 197 ft from either of the tracts and is not used regularly. Undergrowth consists of (listed in decreasing density): Big Sagebrush (*Artemisia tridentata*), Phlox (*Linanthus nuttallii*), Creambush (*Holodiscus microphyllus*), Limber Pine, Squaw Currant (*Ribes cereum*), Mountain Mahogany, Prickly Gilia (*Lepidodactylon pungens*), Antelope Bush (*Purshia glandulosa*), Bristlecone Pine, and Snowberry (*Symporicarpos longiflorus*). Grasses are represented by Bluegrass (*Poa palustris*) and Squirretail (*Sitanion hystrix* var. *californicum*), with the former species contributing 96% of the individuals. **Edge:** To the W of both tracts is a Sagebrush (*Artemisia tridentata*) community. On the E boundaries is a Limber Pine - Pinyon Pine (*P. monophylla*) - Mountain Mahogany ecotone above a Pinyon Pine woodland. The N edge of tract 1 and S edge of tract 2 are very steep and rocky with scattered vegetation. The S edge of tract 1 and N edge of tract 2 are both steep and rocky for approximately 148 ft with a 131 ft wide wash containing Mountain Mahogany and scattered Limber Pine between the two tracts. The edge effect is minimized by the amount of rocks between the two communities. **Topography:** The tracts are on E facing slopes at an elevation from 9400-10,600 ft. The W edges of the tracts follow the crest of the mountain range. Several outcroppings of large rocks are found in the plot. **Weather:** Temperatures ranged from 33-73°F. There was precipitation during the study period but not on census days. **Coverage:** June 6-7, 15-18, 22-25; July 2, 4, 22-23; 0530-1300 and 2030-2300. Total: 53 man-hours. **Census:** Mountain Chickadee, 10 (48, 19); Dark-eyed Junco, 6 (29, 12); Chipping Sparrow, 6; *Empidonax* sp., 5 (24, 10); Hermit Thrush, 3 (14, 6); Broad-tailed Hummingbird, 2; Rock Wren, 2; Blue-gray Gnatcatcher, 2; Com. Flicker, 1; Hairy Woodpecker, 1; White-breasted Nuthatch, 1; House Wren, 1; Yellow-rumped Warbler, 1. **Total:** 13 species; 41 territorial males (196/km<sup>2</sup>, 79/100 acres). **Visitors** (numbers indicate the total number observed): Clark's Nutcracker, 72; Violet-green Swallow, 26; White-throated Swift, 24; Mountain Chickadee, 19; Piñon Jay, 10; Purple Finch, 10; Mountain Bluebird, 6; Am Kestrel, 4; Com. Raven, 4; Black-throated Gray Warbler, 3; Red-tailed Hawk, 2; Rufous Hummingbird, 2; Brewer's Sparrow, 2; Golden Eagle, 1; Scrub Jay, 1; Am Robin, 1; Black-headed Grosbeak, 1; House Finch, 1. **Remarks:** The following nests were found: Broad-tailed Hummingbird, 2; Mountain Chickadee, 2; *Empidonax* sp., 1. Four species of breeding birds were found in the Mahogany wash that were found in no other community: robin, 1 pr.; Warbling Vireo, 2 pr.; Gray Vireo, 3 pr.; and Fox Sparrow, 3 pr. The Com. Flicker, Hairy Woodpecker, *Empidonax* sp., Mountain Chickadee, Clark's Nutcracker, Blue-gray Gnatcatcher, Dark-eyed Junco and Chipping Sparrow utilized the wash for feeding. Inexplicably absent were owls and goatsuckers. Twenty-three unused woodpecker holes, appearing in good condition, were seen on the plot. The Red-tailed Hawk, Golden Eagle, Am. Kestrel, and raven foraged over the plot but do not nest there. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — **PETER WOODMAN** 1825 *Weiman, Ridgecrest, Calif.* 93555.

**109. LOGGED DOUGLAS-FIR RESEEDED WITH MONTEREY PINE.** — **Location:** California; Marin Co., 4.5 mi S of Olema, approximately 0.5 mi E of east gate to Lake Ranch, Point Reyes Nat'l Seashore; 37°58'N, 122°45'W, Double Point Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 8.17 ha = 20.2 acres. **Description of Plot:** See AB 26:983-984 (1972). **Weather:** Generally clear and warm on census days. Extreme drought conditions prevailed, although there was a light rain on April 25. Night and early morning fog was frequent. **Coverage:** April 10, 18, 25; May 6, 13, 19; June 1; 0600-1300. Total man-hours: 30. **Census:** Wrentit, 12 (147, 59); Orange-crowned Warbler, 12; Swainson's Thrush, 8 (98, 40); Hutton's Vireo, 7 (86, 35); Wilson's Warbler, 7; Rufous-sided Towhee, 6 (73, 30); Pygmy Nuthatch, 4 (49, 20); Purple Finch, 3.5 (40, 17); Chestnut-backed Chickadee, 3 (37, 15); Com. Bushtit, 3; Bewick's Wren, 3; Pine Siskin, 2.5; Violet-green Swallow, 2; Steller's Jay, 2; Dark-eyed Junco, 2; California Quail, 1.5; Acorn Woodpecker, 1.5; Starling, 1.5; Allen's Hummingbird, 1; Com. (Red-shafted) Flicker, 1; Hairy Woodpecker, 1; Ash-throated Flycatcher, 1; W Flycatcher, 1; W. Bluebird, 1; Brown Towhee, 1; Song Sparrow, 1; Mourning Dove, 0.5; Scrub Jay, 0.5; Turkey Vulture, +; Red-tailed Hawk, +; Band-tailed Pigeon, +; Olive-sided Flycatcher, +; Com. Raven, +; Black-headed Grosbeak, +. **Total:** 34 species; 90.5 territorial males (1107/km<sup>2</sup>, 448/100 acres). **Visitors:** Cooper's Hawk, Tree Swallow, Purple Martin, Am. Robin, Red Crossbill. **Remarks:** Nests found (14): Mourning Dove 1; Allen's Hummingbird 1; Pygmy Nuthatch, 3; Com. Flicker, 1; Hairy Woodpecker, 1; Violet-green Swallow, 1; Chestnut-backed Chickadee, 1; Com. Bushtit, 1; W Bluebird, 1; Starling, 1; Hutton's Vireo, 1. The Ash-throated Flycatcher is a new breeding species. The number of Allen's Hummingbirds nesting is undoubtedly greater than indicated above: 7 territorial males were plotted this year, a number significantly lower than previous years. Decreases from last year's totals were also noted in Wilson's Warbler (down 26%) and Rufous-sided Towhee (down 34%). In contrast, Swainson's Thrushes increased 32% and Hutton's Vireos doubled. Three more Monterey Pines (*Pinus radiata*) were felled by winter winds; each was 7.9 in. dbh. Contribution No 148, PRBO. — **JULES EVENS**, *Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, Calif.* 94970.

**110. NORTHERN PINYON PINE WOODLAND.** — **Location:** California; Inyo Co., S of New York Butte, about 7.5 air miles NE of Lone Pine; begins in NE $\frac{1}{4}$  Sec 15, T15S, R37E, and ends in SW $\frac{1}{4}$  Sec. 14, T15S, R37E. New York Butte Quadrangle, USGS (unsurveyed), 36°38'N, 117°56'W. **Continuity:** New. **Size:** 27.8 ha = 68.7 acres (602 x 408 x 422 x 952 m). **Description of Plot:** A Pinyon Pine forest on a S facing slope. There are three washes; one on the S border running E-W one on the W border, and one in the center, both of which run N-S. The washes are the lushest portions, with extensive undergrowth. There is little undergrowth on hillsides. The composition of the vegetation is uniform, with varying densities of cover. **Vegetation:** Pinyon Pine (*Pinus monophylla*) woodland interspersed with Utah Juniper (*Juniperus osteosperma*), Mountain Mahogany (*Cercocarpus*

*carpus ledifolius*), and Limber Pine (*P. flexilis*). The shrublike understory consists of (in order of greatest to least density): Big Sagebrush (*Artemisia tridentata*), Gilman's Goldenbush (*Haplopappus gilmianii*), Mountain Joint Fir (*Ephedra viridis*), Antelope-brush (*Purshia glandulosa*), Long-flowered Snowberry (*Symporicarpos longiflorus*), Prickly Gilia (*Leptodactylon pungens*), Mountain Mahogany, Prickly Pear Cactus (*Opuntia erinacea*), Gooseberry (*Ribes lasianthum*), Mock Orange (*Philadelphus microphyllus*), Rabbit Brush (*Chrysothamnus nauseosus*, *C. viscidiflorus*), Cream-bush (*Holodiscus microphyllus*), and Squaw Currant (*Ribes cereum*). Grass species sampled are (order as above): Rice Grass (*Oryzopsis hymenoides*), June Grass (*Koeleria macrantha*), Rock Melic (*Melica stricta*), and Needle Grass (*Stipa coronata*). Grass species noted, but not sampled are Nevada Bluegrass (*Poa nevadensis*), Squirreltail (*Sitanion hystrix*), and Rye Grass (*Elymus cinereus*); these grasses were found in the S wash near the SE corner. A quantitative survey of the vegetation gave the following results: trees, 3-in. diameter and over based on thirteen 0.1 acre circular samples, 101/acre; total basal area, 44.6 ft<sup>2</sup>/acre (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): Single-leaved Pinyon Pine 80, 79, 81, 92; Utah Juniper 4, 4, 12, 23; Mountain Mahogany 16, 16, 4, 3, Limber Pine 1, 1, 3, 3. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, relative dominance, in that sequence): A (3-6 in.) 44, 44, 4.4, 10; B (6-9 in.) 25, 25, 7.4, 16; C (9-15 in.) 24, 24, 29.0, 43; D (15-21 in.) 8, 8, 13.8, 31. Tree species by diameter size class - Pinyon Pine: A 28, 28, 2.8, 6; B 25, 25, 7.4, 16; C 22, 22, 17.8, 40; D 5, 5, 8.3, 19. Utah Juniper: C 2, 2, 1.2, 3, D 2, 2, 4.1, 9. Mountain Mahogany: A 16, 16, 1.6, 4. Limber Pine: D 1, 1, 1.4, 3. Ground cover, 28%; canopy cover, 43%; average canopy height, 22.9 ft (range 8-43). There are two mining claims near the NE corner and an old, collapsed miner's cabin 66ft E of the SE corner. A well was dug there in the wash and water is available to small birds 2.5 ft below ground level. A small structure was built over the well but small passerines were seen flying out. There is no regular human nor any cattle usage. **Edge:** The N edge is a Mountain Mahogany-Sagebrush community; the upper 1/4 of the W edge has steep, barren rocks and the lower 1/4 is a Pinyon forest; the S edge is bordered by a Sagebrush habitat on a N facing slope; the E edge is bordered by a Pinyon-Mountain Mahogany-Sagebrush ecotone grading to a Mountain Mahogany-Sagebrush community. **Elevation:** Ranges from 8200-9400 ft. **Water:** The nearest permanent water lies 66 ft E of the SE corner, outside the plot. **Weather:** Temperatures ranged from 42° to 68°F. Some precipitation fell during the study period but none fell on study days. **Coverage:** June 7-8, 14-17, 21-24; July 3, 5, 23-24; 0530-1200 and 2000-2300. Total: 50 man-hours. **Census:** Black-throated Gray Warbler, 19 (68, 28); Mountain Chickadee, 9 (32, 13); Gray Flycatcher, 6 (22, 9); Blue-gray Gnatcatcher, 5 (18, 7); *Empidonax* sp., 3 (11, 4); Rufous-sided Towhee, 3; Chipping Sparrow, 3; Com. Flicker, 2; Rock Wren, 2; Broad-tailed Hummingbird, 1; Brown-headed Cowbird, 1. **Total:** 11 species; 54 territorial males (194/km<sup>2</sup>, 79/100 acres). **Visitors** (numbers indicate the total number observed): Clark's Nutcracker, 36, House Finch, 35; Chukar, 34; Piñon Jay, 28; White-throated Swift, 23; Com. Bushtit, 15; Scrub Jay, 5;

Rufous Hummingbird, 4; Hairy Woodpecker, 3; Com Raven, 2; White-breasted Nuthatch, 2; Black-headed Grosbeak, 2; Dark-eyed Junco, 2; Am. Kestrel, 1; Long-eared Owl, 1; Black-chinned Hummingbird, 1; Bewick's Wren, 1; Purple Finch, 1; Fox Sparrow, 1. **Remarks:** One Blue-gray Gnatcatcher nest was found. The Chukar, Scrub Jay, Com. Bushtit, Bewick's Wren, and House Finches probably nested in other areas and were spending the summer in the Pinyon forest. Inexplicably absent were breeding owls. White-throated Swifts, ravens, and the Am. Kestrel all used the plot for foraging but not nesting. The Rock Wren, Rufous-sided Towhee, and Chipping Sparrows are probably products of the edge effect, as they were only near the Mountain Mahogany-Sagebrush community. One pair of White-throated Swifts was seen mating over the plot but there is no suitable nesting area there. Twelve unused woodpecker holes were found, nine of which are in dead trees. Pinyons were used for feeding more than any other vegetation though all species of plants were observed to be used for foraging. This study was sponsored by the Bureau of Land Management, California Desert Plan Program — **PETER WOODMAN, 1825 Weiman, Ridgecrest, Calif 93555.**

**111. PINYON-JUNIPER WOODLAND — Location:** California; San Bernardino Co., Mid Hills, about 0.5 mi W of the entrance to Mid Hills Campground, and about 110 yards E of a poor dirt road that runs N to Cedar Canyon; SW 1/4 Sec. 13, T12N, R14E, Mid Hills Quadrangle, USGS; 35°07'N, 115°26'W. **Continuity:** New. **Size:** 9 ha = 22.24 acres (square, 300 x 300 m, paced on a magnetic N compass grid). **Description of Plot:** See AB 30:1062-1063 (1976). **Weather:** A series of late cold fronts during the census period kept temperatures lower than normal. Temperatures during censuses varied from 40° to 75°F. Skies were clear on the majority of census days. Significant amounts of precipitation fell during May 8-9. **Coverage:** April 16, 23; May 2, 10, 17, 22, 26; June 9, from 0500-0800, PST. Total man-hours: 24. **Census:** Bewick's Wren, 2; Plain Titmouse, 1.5; Com. Bushtit, 1.5; Scrub Jay, 1; Scott's Oriole, 1; House Finch, 1; Black-throated Sparrow, 1; White-throated Swift, +; Ladder-backed Woodpecker, +; Ash-throated Flycatcher, +; Crissal Thrasher, +; Blue-gray Gnatcatcher, +; Brown-headed Cowbird, +. **Total:** 13 species; 9 territorial males (100/km<sup>2</sup>, 40/100 acres). **Remarks:** One Bewick's Wren nest was found and Scrub Jay, Plain Titmouse and Crissal Thrasher were seen with juveniles freshly out of the nest. Bushtits were seen carrying nesting material. White-throated Swifts were seen over the plot and undoubtedly nest in nearby rocky crags. Cowbirds were seen flying low across the plot. Numerous off-road vehicle tracks appeared on the plot. This census was sponsored by the Bureau of Land Management, California Desert Program. — **STEVEN W. CARDIFF, 2736 Court St., Rialto, Calif. 92376.**

**112. COTTONWOOD RIVERBOTTOM — PASTURE. — Location:** Colorado; Weld Co., about 6 mi S and 1 mi E of Johnstown on E bank of St. Vrain Creek and 1 mi upstream from its confluence with South Platte River. Bordered on E by Weld Co. Road No. 38; S3, T3N, R67W, 40°14'N, 104°52'W, Johnstown Quadrangle, USGS. **Continuity:** Established 1973; 5 consecutive years. **Size:** 71.6 ha = 176.9 acres. **Description of Plot:** See AB 27:1006-1007 (1973). **Weather:** Mostly clear,

occasionally overcast, cool to hot. **Coverage:** May 6, 13, 24, 31; June 7, 14, 22, 28; dawn to 0945. Total man-hours: 20. **Census:** House Wren, 36 (50, 20); W. Meadowlark, 35 (49, 20); Red-winged Blackbird, 25 (35, 14); Starling, 22 (31, 12); Com. Flicker, 13 (18, 7); Com. Yellowthroat, 12 (17, 7); Mourning Dove, 11 (15, 6); Am. Kestrel, 5 (7, 3); E. Kingbird, 5; Brown-headed Cowbird, 5, Virginia Rail, 4 (6, 2); Killdeer, 4; Mallard, 3 (4, 2); Rough-winged Swallow, 3; Yellow Warbler, 3; Cinnamon Teal, 2; Ring-necked Pheasant, 2; Rock Dove, 2; Great Horned Owl, 2; Brown Thrasher, 2; Blue Grosbeak, 2; Lazuli Bunting, 2; Am. Bittern, 1; Blue-winged Teal, 1; Sora, 1; Spotted Sandpiper, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Black-billed Magpie, 1; Mockingbird, 1; Am. Robin, 1; Yellow-headed Blackbird, 1; Com. Grackle, 1; Song Sparrow, 1. **Total:** 34 species; 212 territorial males or females (296/km<sup>2</sup>, 120/100 acres). **Remarks:** Major increases (> 50%) occurred in 4 species (House Wren, Com. Flicker, Com. Yellowthroat and Am. Kestrel), while major decreases were *not* noted in any species. In general, there has been an increase in species (15 to 34) and individual pairs (60 to 212) from 1973 to 1977. This is believed due to improvement in water conditions (runoff from the power plant) and habitat. There was virtually no grazing on the area in 1977 and understory vegetation made a remarkable recovery. The area has been censused regularly since 1972 as a continuing avian monitoring program to evaluate the effects of the Fort St. Vrain Nuclear Generating Station, which as yet is not fully operational. — *HERMAN J. GRIESE, Dept. of Fishery and Wildlife Biology, Colorado State Univ., Ft. Collins, Co. 80523.*

### 113. MIXED-MESOPHYTIC CANYON BOTTOM

— **Location:** New Mexico; McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; Sec. 34, T13N, R13W; 35° 19'N, 108°12'W, Pine Canyon Quadrangle, USGS. **Continuity:** Established 1959; 2 intermittent years. **Size:** 12.14 ha = 30.0 acres. **Description of Plot:** See AFN 13: 466-467 (1959). The plot was extended up-and downstream from the 1959 plot, but no new vegetation types were added. The plot comprises about one linear mile of the streambed and the flood plain of Sawyer Creek. The upper half is dominated by mature Ponderosa Pines (*Pinus ponderosa*) with very little understory, and the lower half is dominated by small groves of Narrow-leaf Cottonwood (*Populus angustifolia*) separated by willow (*Salix* spp.) thickets and grassy areas. Because of lack of uniformity, quantitative analysis of the vegetation would appear to be misleading. **Edge:** Pinyon-juniper woodland, except for the lower one-fourth, which is bounded by grassland. **Topography:** Essentially flat bottom of a shallow canyon. Canyon slopes were included where they bore vegetation typical of the canyon bottom. **Elevation:** 7520-7620 ft (2292-2322 m). **Weather:** The first half of 1977 was extremely dry, with virtually no precipitation. The first major rainfall of the summer came on July 21. Monthly precipitation (inches) and mean daily maximum and minimum temperatures (°F) were as follows: June, 0.13, 77.3, 37.3; July, 2.66, 79.1, 48.1; August, 2.35, 84.2, 52.1 (August temperatures for the first half of the month only). Winds were light throughout the census period. **Coverage:** March 26; May 25-June 9, June 17-August 16; 0400-2400, MDT. Total man-hours; well over 100. **Census:** The second number after each species name is the number of territorial males or females found within the

bounds of the 1959 census. Cliff Swallow, 12, 0 (99, 40); Violet-green Swallow, 10, 6 (82, 33); Pygmy Nuthatch, 7, 3 (58, 23); Am. Robin, 6, 4 (49, 20); Mountain Chickadee, 5.5, 3 (45, 18); Dusky Flycatcher, 5, 2 (41, 17); Mourning Dove, 4, 2 (33, 13); Broad-tailed Hummingbird, 4, 2 (33, 13); Virginia's Warbler, 4, 3 (33, 13); Lesser Goldfinch, 4, 2; Gray-headed Junco, 3.5, 1 (29, 12); White-breasted Nuthatch, 3, 1 (25, 10); Starling, 3, 3 (25, 10); Solitary Vireo, 3, 1 (25, 10); Grace's Warbler, 3, 1 (25, 10); Brewer's Blackbird, 3, 0 (25, 10); Chipping Sparrow, 3, 2 (25, 10); Yellow-bellied Sapsucker, 2, 2; W. Wood Pewee, 2, 2; W. Bluebird, 2, 2; W. Tanager, 2, 0; Black-headed Grosbeak, 2, 2; Green-tailed Towhee, 2, 1; Rufous-sided Towhee, 2, 2; Cooper's Hawk, 1, 1; Flammulated Owl, 1, 1; Great Horned Owl, 1, 1; Long-eared Owl, 1, 0; Saw-whet Owl, 1, 0; Hairy Woodpecker, 1, 1; Western Flycatcher, 1, 1; Steller's Jay, 1, 1; Mountain Bluebird, 1, 0; Brown-headed Cowbird, 1, 1; Scrub Jay, 0.5, 0.5. **Total:** 35 species; 107.5 territorial males or females (885/km<sup>2</sup>, 358/100 acres). **Remarks:** 41 nests were found: Cliff Swallow, 12; Violet-green Swallow, 6; Mourning Dove, 3, Dusky Flycatcher, 2; Mountain Chickadee, 2; Pygmy Nuthatch, 2; Am. Robin, 2; W. Bluebird, 2; Starling, 2, Gray-headed Junco 12; Cooper's Hawk, 1; Great Horned Owl, 1; Broad-tailed Hummingbird, 1; Yellow-bellied Sapsucker, 1; W. Wood Pewee, 1; White-breasted Nuthatch, 1; Mountain Bluebird, 1. Compared to the 1959 census, 10 species were lost and 13 gained. Of these, 14 nested in a general area both years and were probably missed because of minor differences in plot size or censusing techniques. Black-chinned Hummingbirds and Yellow-rumped Warblers have disappeared as breeders, and Starlings have moved into the area. Warbling Vireos and Willow Flycatchers (both 1959) may breed locally some years. The Black-capped Chickadees recorded in 1959 are regarded by several authorities as a likely misidentification. Yet the species was also recorded locally in 1960 and 1961. These birds (or bird; the 1959 pair may have been mixed) may have been strays which persisted in the area for several seasons. There is no evidence of a Black-capped Chickadee irruption in AFN reports for any of these years. The total absence of Yellow-bellied Sapsuckers and Gray-headed Juncos from the 1959 census is inexplicable. There is no way of assessing the local history of the Dusky Flycatcher, as the species may have been misidentified in the past. Seven were netted and identified in the hand this year. This is the only known population of the species in western New Mexico between the Jemez Mountains and the White Mountains of Arizona (J. P. Hubbard, pers. comm.). In general, the area seems to support an avian community adapted to slightly more mesic conditions than that of 1959. In keeping with usual patterns of habitat separation, Mountain Bluebirds and Green-tailed Towhees nested downstream in more open habitat than W. Bluebirds and Rufous-sided Towhees. We wish to thank S. Buchsbaum for supplying weather data, C. Grimm for assisting with netting, and S. Pearce and D. Weld for assisting with census taking. — *JENNIFER J. PRICE and D. ARCHIBALD McCALLUM, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323.*

114. FARM WITH PONDS. — **Location:** Utah, Washington Co., Springdale Town (Springdale Development Corp. properties); 37°10'N, 113°00'W; Zion National Park Topographic Map (Zion Canyon Section), USGS. **Continuity:** Established 1976. **Size:** 10.52 ha = 26

acres. **Description of Plot:** See *AB* 31:79 (1977). With summer cattle ranges closed because of the severe drought, the hay fields were grazed all summer, resulting in a lack of seed-bearing plants and cover for ground-nesting birds. One spring that fed the cattail-covered pond failed in mid-June; half of the pond had dried up by the end of the month. **Weather:** May was unusually cold and windy, with average maximum temperatures 8°F below normal. Several good storms brought above average moisture, but it failed to penetrate soil baked by two years of drought. **Coverage:** May 1, 15, 21, 29; June 4, 11, 20, 25; July 3, 10, 15-16, 23; 0545-1300, MDT. Total man-hours: 27. **Census:** Red-winged Blackbird, 17 (162, 65); Am. Robin, 4; Yellow Warbler, 4; Lesser Goldfinch, 4; Gambel's Quail, 3 (29, 12); Black-chinned Hummingbird, 3; N. Oriole, 3; Virginia Rail, 2; Spotted Sandpiper, 2; Broad-tailed Hummingbird, 2; Black-headed Grosbeak, 2; Ring-necked Pheasant, 1; Sora, 1; Black Phoebe, 1; Say's Phoebe, 1; Scrub Jay, 1; Phainopepla, 1; Starling, 1; Song Sparrow, 1. **Total:** 21 species; 64 males and female hummingbirds and blackbirds (608/km<sup>2</sup>, 246/100 acres). **Remarks:** Twenty species that bred in 1976 either failed to appear or did not stay long enough to nest, while only 55% of last year's total nested this year; prolonged drought, coupled with cold, windy weather during May, probably caused the drop in breeding activity. Rails and blackbirds had finished nesting before cattle grazed the cattails from the dried-up pond in late June. Three pairs of quail produced only 8 young. Sora and Broad-tailed Hummingbirds were new this year, the hummingbirds remained in Zion Canyon to use bird feeders, instead of moving to their usual range at higher elevations. — *JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767.*

**115. 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; 5 consecutive years. **Size:** 32.38 ha = 80 acres. **Description of Plot:** See *AB* 27:1002-1003 (1973). **Weather:** Temperatures 31-60°F; clear on 10 censuses and partly cloudy on 5. Rain amounted to 0.46 in. (June 17 to July 31). Fall, winter and spring precipitation was well below normal and snowpack was almost nonexistent, leading to an early nesting season. **Coverage:** June 17-18, 21, 23, 25, 27, 29; July 2, 5, 7-8, 11, 13, 15, 19; 0523-0835, PDST. Total man-hours: 40. **Census:** Chipping Sparrow, 20 (62, 25), Ruby-crowned Kinglet, 9 (28, 11); Yellow-rumped Warbler, 8 (25, 10); White-crowned Sparrow, 7 (22, 9); Lincoln's Sparrow, 6 (19, 8); Am. Robin, 4 (12, 5); Cassin's Finch, 4; Fox Sparrow, 3 (9, 4); Com. Flicker, 1; Mountain Chickadee, 1; Rock Wren, 1; Mountain Bluebird, 1; Golden-crowned Kinglet, 1; Lazuli Bunting, 0.5. **Total:** 14 species; 66.5 territorial males (205/km<sup>2</sup>, 83/100 acres) **Visitors:** Spotted Sandpiper, Rufous Hummingbird, Gray Jay, Steller's Jay, Clark's Nutcracker, Red-breasted Nuthatch, Pine Siskin, Red Crossbill, Vesper Sparrow, Dark-eyed Junco, Brewer's Sparrow. **Remarks:** Nests located; Com. Flicker (2 fledglings), 1; Mountain Chickadee, 1; Yellow-rumped Warbler (2 fledglings), 1; Lincoln's Sparrow (3 fledglings), 1; Numbers of species were down 4 from the 18 recorded last year, with 2 species new for the plot (Rock Wren and Golden-crowned Kinglet). Breeding activity was close to the level

recorded in 1975 with a notable doubling from 4.5 to 9 breeding pairs of Ruby-crowned Kinglets, while Yellow-rumped Warblers were back to the 8 territorial males recorded in 1973. Chipping Sparrows increased by 7 pairs over 1975-76, while Fox Sparrows halved in numbers from the 1976 record 6 pairs; Mountain Bluebirds dropped drastically from 5 pairs in 1976 to just one pair this year. White-crowned Sparrows also dropped drastically from 13 pairs in 1976 to just 7 in 1977. While Spotted Sandpipers were recorded early, drought conditions eliminated this breeding bird for the first time since the census started. Lazuli Buntings have returned after an absence of 3 seasons, though they had bred south of plot in 1974. Cassin's Finches dropped back to 4 pairs after last year's 8. An early and quite dry spring may be responsible for some of the drop in territorial males. We are grateful to the staff of the Malheur National Forest for their cooperation and assistance. — *MERLE A. ARCHIE, and ROBERT A. HUDSON, P.O. Box 81, Bates, Ore. 97817.*

**116. DIGGER PINE PARKLAND** — **Location:** California; Inyo Co., Sand Canyon, in southern most extension of the Sierra Nevadas, 12 mi N on State Hwy 14 from intersection of State Hwys. 178 and 14, then about 6 mi W on Brown Rd., N boundary is immediately adjacent to road, T25S, R37E, sections unsurveyed, Little Lake Quadrangle, 35°47'N 117°56'W. **Continuity:** New. **Size:** 9.06 ha = 22.4 acres. **Description of Plot:** Near the confluence of an intermittent and a permanent stream. A dirt road passes over the SE portion of the plot. A relatively open, park-like stand of Digger Pine (*Pinus sabinaiana*) interspersed with other tree species, predominantly willow. The woody undergrowth is rather sparse and consists of Rabbitbrush (*Chrysothamnus nauseosus*, *C. viscidiflorus*, *C. teretifolius*), Squaw Waterweed (*Baccharis sergiloides*), Mule Fat (*B. glutinosa*), Basin Sagebrush (*Artemisia tridentata*), Linear-leaved Goldenbush (*Haplopappus linearifolius*), Bitterbrush (*Purshia tridentata*), Desert Peach (*Prunus andersonii*), Cottonwood (*Populus eremontii*), Joint-Fir (*Ephedra viridis*), and Beavertail Cactus (*Opuntia basilaris*). Other shrub species are: Snakeweed (*Gutierrezia microcephala*), *Ceanothus* sp., *Vitis Girdiana*, and *Atriplex canescens*. There is ground cover of perennial grasses: *Poa secunda*, *P. nevadensis*, *Sitanion hystrix*, *Elymus glaucus*, *Muhlenbergia asperifolia*, *Melica imperfecta*, and *Koeleria cristata*. Herbaceous growth and annuals are also important, there are such species as *Bromus diandrus*, *B. rubens*, *Descurainia pinnata*, *Lepidium fremontii*, *Phacelia* sp., *Senecia douglasii*, *Cirsium undulatum*, *Salvia columbariae*, and *Trifolium wormskioldii*. A quantitative survey of the vegetation gave the following results: trees, 3-in. in diameter and over, based on six 0.1-acre circle samples: 78.4/acre; total basal area, 136.4 ft<sup>2</sup>/acre. Species comprising the study plot (figures after each species give number of trees/acre, relative density (%), relative dominance, and frequency in that sequence): Digger Pine 62, 80, 94, 100; Willow (*Salix gooddingii*), 8, 10, 1, 33; Flowering Ash (*Fraxinus dipetala*), 6, 8, 4, 17; Black Walnut (*Juglans nigra*) 2, 2, 1, 17. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft<sup>2</sup>/acre, and relative dominance): A (3-6 in.) 10, 12, 1.1, 1; B (6-9 in.) 24, 31, 7.4, 5; C (9-15 in.) 21, 26, 16.3, 12; D (15-21 in.) 11, 14, 19.8, 14; E (21-27 in.) 3, 4, 10.0, 8; F (27-33

in) 2, 2, 7 8, 6, G (33-40 in), 3, 4, 23 3, 17, H (> 40 in), 5, 6, 50.7, 37. Tree species by diameter size class - Digger Pine A 6, 8, 0.7, +; B 18, 22, 5.4, 4; C 16, 20, 12.6, 9; D 10, 12, 17.0, 12; E 3, 4, 10.0, 7; F 2, 2, 7.8, 6; G 3, 4, 23.2, 17, H 5, 6, 50.7, 37. Willow: A 3, 4, 0.4, +; B 5, 6, 1.5, 1. Flowering Ash: B 2, 2, 0.5, +; C 3, 4, 2.5, 2; D 2, 2, 2.8, 2. Black Walnut: C 2, 2, 1.2, 1. Ground cover, 25%, Canopy cover, 75%; average canopy height, 71.7 ft (range 45-85 ft) Cattle have grazed on the plot for decades and continue to use the area; old ranch buildings are nearby. Camping occurs on site and there is a refuse dump in the intermittent streambed on the plot edge. Human related uses have undoubtedly affected vegetation composition and cover. **Edge:** Bounded on E by willows, on N and S by desert scrub and on W by a rather steep hill sparsely covered with pine. **Topography:** Relatively flat, with the exception of the SE corner, where the terrain is more rugged. A rock outcropping extends from the central portion of the S boundary to the center. Elevation: 3920 ft **Weather:** Temperatures 45-94°F. Light rain fell on April 30 and May 1, heavy rain on May 8 and 9. Some precipitation occurred on several other days in May. **Coverage:** April 30; May 3, 5, 8, 10, 13, 18, 27: 0430-0900, PST. Total man-hours: 16. **Census:** Mourning Dove, 5 (55, 22); Scrub Jay, 3 (33, 13); House Finch, 3; Lesser Goldfinch, 3; Costa's Hummingbird, 2; Blue-gray Gnatcatcher, 2; Black-throated Sparrow, 2; Long-eared Owl, 1; Hairy Woodpecker, 1; Cañon Wren, 1; MacGillivray's Warbler, 1; Scott's Oriole, 1; W. Tanager, 1; Lawrence's Goldfinch, 1. **Total:** 14 species; 27 territorial males (298/km<sup>2</sup>, 121/100 acres). **Remarks:** Nests of Lesser Goldfinch (2) and Blue-gray Gnatcatcher (1) were found and 2 recently fledged Long-eared Owls were seen. Hermit Thrushes possibly nested, but no conclusive evidence was found. Estimates of density for Mourning Doves and House Finches may be inaccurate owing to the difficulty of determining breeding birds in contrast to those regularly passing through the plot. This study was sponsored by the Bureau of Land Management, California Desert Plan Program; they also provided vegetation data — **CHARLES F. DOCK**, 1164 W. Adams Blvd., Los Angeles, Calif. 90007.

**117. URBAN NATURE CENTER.** — **Location:** California, Los Angeles Co., El Dorado Nature Center, Long Beach, bounded on the N by Spring St., S by Willow St., E by a tree farm, W by the San Gabriel River. **Continuity:** Established 1976. **Size:** 34.4 ha = 85 acres. **Description of Plot:** See AB 31:78 (1976) censuses no. 131 and 132, see also AB 25:656 (1971) census no. 39. **Weather:** Morning low cloud cover on most days; 1.3 in. rain; temperature range 81°-49°F. **Coverage:** April 12, 14, 17, 19, 21, May 3, 15, 17, 19-22, 26, 28; 0530-1000. Total man-hours 61. **Census:** Mourning Dove, 27 (78, 32); Song Sparrow, 15 (44, 18); Mockingbird, 14 (41, 16); Starling, 6 (17, 7); N. Oriole, 6; Spotted Dove, 5 (15, 6); Lesser Goldfinch, 5; Black-chinned Hummingbird, 3 (9, 4); Loggerhead Shrike, 3; Anna's Hummingbird, 2; Com. Bushtit, 2; Red-winged Blackbird, 2; Brown-headed Cowbird, 2; House Finch, 2; Pied-billed Grebe, 1; Am. Coot, 1; Black Phoebe, 1; Am. Robin, 1. **Total:** 18 species, 98 territorial males or females (285/km<sup>2</sup>, 115/100 acres) **Visitors:** Ash-throated Flycatcher, W. Wood Pewee, Long-billed Marsh Wren, Swainson's Thrush, Tricolored Blackbird. **Remarks:** 40 active nests found: Mourning Dove, 21; Mockingbird, 7; N. Oriole, 6; Com. Bushtit, 2; Starling, 2; Loggerhead Shrike, 1; Lesser

Goldfinch, 1. A flock of 50 (+) immature Starlings was feeding in the study area after May 20. Territories of Mourning Doves and Mockingbirds were only one half of that reported last year. Territories of Song Sparrows were twice as high as last year's. These differences are most likely owing to the different means utilized by the different observers in evaluating the field data. — **JEFF BOYD and BRIAN DANIELS**, Dept. Biol., Cal. St U., Long Beach, Calif. 90840.

**118. WILLOW WOODLAND - FRESHWATER MARSH.** — **Location:** California; Los Angeles Co., South Gardena Park Site; NW of intersection of Artesia Blvd. and Vermont Ave., Gardena; 33°53'N, 118°18'W **Continuity:** New. **Size:** 2.85 ha = 7.03 acres (irregular in shape, acreage determined from paced boundaries) **Description of Plot:** Remnant parcel of natural riparian habitat historically present throughout drainages on the southern California coastal floodplain; such habitat has been essentially eliminated in the Los Angeles basin as a result of stream channelization, draining of wetlands, and urban sprawl. Additional description of physical and vegetational characteristics of the area are given in the 1976 Winter Bird Population Study (AB 32:00). The plot is in a shallow depression, and becomes flooded with rainwater runoff. The extent of this flooding varied between 70% of the area during the first census and 35% of the area on the last census. **Weather:** Daytime temperatures averaged 73°F. Severe drought conditions prevail in California; a heavy rain storm in early May left record precipitation for this single month, but failed to have a significant impact on the overall water supply. **Coverage:** March 8, 15, 22; April 6, 15, 25-26; May 6-7, 0600-1045, Total man-hours: 13. **Census:** Song Sparrow, 12 (422, 171); Mourning Dove, 5 (176, 71); Brown-headed Cowbird, 5; Black-chinned Hummingbird, 4 (141, 57); Com. Bushtit, 3 (105, 43); Lesser Goldfinch, 3; Brown Towhee, 2.5 (87, 36); Anna's Hummingbird, 2; House Sparrow, 2; House Finch, 2; Red-winged Blackbird, 1; W. Meadowlark, 0.5; Red-shouldered Hawk, +. **Total:** 13 species; 42 territorial males or females (1476/km<sup>2</sup>, 597/100 acres). **Remarks:** The following species were present but nesting could not be documented: Cinnamon Teal, Sora, and House Wren. This project was made possible through a grant from the Shirley Wells Conservation Fund of the El Dorado Audubon Society — **JONATHAN ATWOOD**, 2218 San Anseline #6, Long Beach, Calif. 90815.

**119. CREOSOTEWASH.** — **Location:** Texas, El Paso Co., 0.5 mi W of intersection of Interstate 10 and Mesa Street, 31°46'N, 106°30'W, El Paso Quadrangle, USGS. **Continuity:** New. **Size:** 15.62 ha = 38.6 acres (measured from topographic map with planimeter) **Description of Plot:** The dominant shrub species include Creosotebush (*Larrea tridentata*) and White-thorn Acacia (*Acacia constricta*). Snakeweed (*Gutierrezia lucida*), Mesquite (*Prosopis juliflora*) and *Ephedra viridis* occur in lesser amounts. A point-centered-quarter survey of the vegetation gave the following results: Individuals per acre, 417; total percent cover per acre, 18%. Importance percentage of major shrub species: Creosotebush 60%, Acacia 19%, Mesquite 9%, Snakeweed 9%, Ephedra 2% **Edge:** Bordered on the E and N by similar habitat, on the S by a rockwall and on the W by an access road. **Topography:** A gently sloping, steep-sided drainage. **Elevation:**

Approximately 3400 ft **Weather:** Warm throughout period; rain on 2 days. **Coverage:** July 1-8; dawn-0900. Total man-hours: 19. **Census:** Black-throated Sparrow, 10 (64, 26), Black-chinned Hummingbird, 6 (38, 16), Mockingbird, 3 (19, 8), Scaled Quail, 1; Mourning Dove, 1, Scott's Oriole, 1, House Finch, 1. **Total:** 7 species; 23 territorial males ( $147/\text{km}^2$ , 60/100 acres). **Visitors:** Am. Kestrel, Lesser Nighthawk, Loggerhead Shrike, Red-winged Blackbird. **Remarks:** Nests located: Mourning Dove, 2 with two eggs; Scott's Oriole, 1; Scaled Quail with 5 young. — *WILLIAM HOPPES, 300 Country Club, El Paso, Texas. 79922.*

**120. BLUE GRAMA-RABBITBRUSH GRASS-LAND** — **Location:** New Mexico; McKinley Co., Cottonwood Gulch, 7 mi S of Thoreau; SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 26, T13N, R13W; 35°19'N, 108°11'W, Pine Canyon Quadrangle, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (square, surveyed). **Description of Plot:** Species composition, coverage, and frequency were estimated by point interception at 1 m intervals along two 325 m transects. Each 25 m segment of a transect was considered a plot for the purpose of estimating frequency. Absolute percentages for coverage and frequency are as follows: bare ground, 34.2, 100; litter, 2.3, 42; rocks, 1.0, 12; Rabbitbrush (*Chrysothamnus nauseosus*), 10.5, 81; Snakeweed (*Gutierrezia sarothrae*), 7.2, 50; Rose (*Rosa* sp.), 1.5, 12; Four-wing Salt-bush (*Atriplex canescens*), 0.9, 15; Blue Grama (*Bouteloua gracilis*), 18.6, 88; Sand Dropseed (*Sporobolus cryptandrus*), 7.1, 62; herbs, 15.5, 88, other grasses, 5.5, 65. **Edge:** One fourth of the perimeter is bordered by heavily-grazed irrigated pastureland. The remainder of the perimeter is abutted by similar vegetation. **Topography:** Gently sloping to the NW corner, except for a steep 2 m slope which separates the alluvial NW corner from the residual soils on the remainder of the plot. **Elevation:** 7420-7460 ft (2262-2274 m) **Weather:** See Census 113. **Coverage:** May 28; June 3, 7, 24, July 1-2, 9, 19, 28; dawn-1130, MDT. Total man-hours 22. **Census:** Vesper Sparrow, 5.5 (34, 14); Brewer's Sparrow, 4 (25, 10); Horned Lark, 2; W. Meadowlark, 2; Green-tailed Towhee, 1. **Total:** 5 species, 14.5 territorial males ( $90/\text{km}^2$ , 36/100 acres). **Visitors:** Am. Kestrel, Killdeer, Mourning Dove, Broad-tailed Hummingbird, Violet-green Swallow, Cliff Swallow, Sage Thrasher, W. Bluebird, Mountain Bluebird, Brewer's Blackbird, Brown-headed Cowbird. **Remarks:** Nest found: 1 Vesper Sparrow. A Sage Thrasher was seen and heard singing on two occasions, but otherwise was not detected. Grazing has been sporadic for over 10 years. M. Barbehenn, P. Broder, R. Shrigley, R. Vonnegut, and C. Weld assisted with census taking. — *D. ARCHIBALD McCALLUM and JENNIFER J. PRICE, Cottonwood Gulch Foundation, Box 969, Thoreau, N.M. 87323*

**121. CREOSOTEBUSH DESERT SCRUB.** — **Location:** Arizona; Maricopa Co., 1 mi E of Scottsdale; 33°35'N, 111°52'30"W, Sawik Mountain Quadrangle, USGS. **Continuity:** New. **Size:** 19.47 ha = 48.1 acres (1254 x 1672 ft, measured with a compass and tape). **Description of Plot:** The dominant plant is Creosotebush (*Larrea divaricata*) averaging 5 ft in height and spaced 5-20 ft apart. The dominant grass is *Schismus barbatus*. Approximately  $\frac{1}{4}$  of the ground is void of plants. **Edge:** Surrounded on all sides by similar habitat. **Topography:** Flat **Elevation:** 1380 ft **Coverage:** May 14-16, 28-30

**Total:** 6 trips, 0520-1020, averaging 78 minutes Total man-hours: 7.8. **Census:** Bendire's Thrasher, 1; Loggerhead Shrike, 0.5; Gambel's Quail, +; Cactus Wren, +, Verdin, +. **Total:** 5 species; 1.5 territorial males ( $8/\text{km}^2$ , 3/100 acres). **Remarks:** The census area is the site of a future housing development. — *RANDALL MADDING, Box 1614, Nogales, Ariz. 85621.*

**122. PALOVERDE DESERT SCRUB.** — **Location:** Arizona; Maricopa Co., 3 mi E of Scottsdale; 33°35'N, 111°50'W, Sawik Mountain Quadrangle, USGS. **Continuity:** New. **Size:** 12.18 ha = 30.1 acres (1045 x 1254 ft, measured with a compass and tape). **Description of Plot:** Dominant plants are Yellow Paloverde (*Cercidium microphyllum*) and Ironwood (*Olcneya tesota*). Other plants in the plot are Creosotebush (*Larrea divaricata*), Jojoba (*Simmondsia chinensis*), Wolfberry (*Lycium* sp.), Bitterbush (*Encelia parinosa*), Bursage (*Ambrosia* sp.), Indian Paintbrush (*Castilleja linariaefolia*), Mistletoe (*Phoradendron californicum*), Saguaro (*Cereus giganteus*), Barrel Cactus (*Ferocactus* sp.), and Cholla (*Opuntia* sp.). Approximately  $\frac{1}{4}$  of the ground is void of plants. **Edge:** Surrounded on all sides by similar habitat. **Topography:** Flat. **Elevation:** 1530 ft. **Coverage:** May 14-16, 28-30. Total, 6 trips, 0535-1100, averaging 58 minutes Total man-hours: 5.8. **Census:** Gambel's Quail, 1.5, Verdin, 1.5; Costa's Hummingbird, 1; Com. Flicker, 1, Cactus Wren, 1; Black-tailed Gnatecatcher, 1; Brown-headed Cowbird, 1; Gila Woodpecker, 0.5; Starling, +; House Sparrow, +; Rose-breasted Grosbeak, +; House Finch, +. **Total:** 12 species; 8.5 territorial males ( $70/\text{km}^2$ , 28/100 acres). **Remarks:** The plot is the site of a future housing development. — *RANDALL MADDING, Box 1614, Nogales, Ariz. 85621.*

**123. PYGMY FOREST-CHAPARRAL.** — **Location:** Utah, Kane Co., E entrance of Zion National Park, 37°14'N, 112°52'30"W (W $\frac{1}{2}$  of NE $\frac{1}{4}$ ; E $\frac{1}{2}$  of NW $\frac{1}{4}$  of NW $\frac{1}{4}$ , Sec. 20, T41S, R9W, Salt Lake B&M): Zion National Park Topographic Map (Zion Canyon Section), USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (440 yards square, paced). **Topography:** Ridges and arid drainages on a canyon bottom. **Elevation:** 1731-1798 meters (5680-5900 ft). **Description of Plot:** A low forest, with Utah Juniper (*Juniperus osteosperma*) the dominant tree; the woodland is interspersed with dense patches of Gambel Oak (*Quercus gambelii*) and clearings covered with Big Sagebrush (*Artemisia tridentata*). Chaparral covers a ridge in the SW corner; another ridge at the N center has Pinyon Pine (*Pinus edulis*) and Greenleaf Manzanita (*Arctostaphylos patula*). Trees 3-in. and over, based on six circular 1/10-acre samples, 50/acre; total basal area 10 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees: Gambel Oak, 32, 65, 72, 17; Utah Juniper, 10, 19, 21, 67; Pinyon Pine, 5, 13, 6, 17, Ponderosa Pine (*P. ponderosa*), 2, 3, 1, 17. Trees by diameter size class: A (3-6 in.) 37, 74, 2.3, 23; B (6-9 in.) 11, 22, 6.9, 69; C (9-15 in.) 2, 4, 0.8, 8; D-H (over 15 in.) 0, canopy cover 22%; canopy height 21 ft (range 16-30), ground cover 36%. The chaparral is composed of sapling Gambel Oaks 47%, Big Sagebrush 27%, Parry Rabbitbrush (*Chrysothamnus parryi*) 15%; Greenleaf Manzanita 7% and Green Ephedra (*Ephedra viridis*) 3%, with 988 shrub stems/acre. **Edge:** Bordered on all sides by similar vegetation. Beyond the NE and NW corners are sheer cliffs 500-700 ft high. Soil: sand, with some out-

croppings of sandstone. **Weather:** Temperatures were slightly above average. Good storms in early June brought spring flowers into bloom in July after they had been held back by drought. **Coverage:** June 5, 12, 17, 26; July 4, 8-9, 17, 20-21, 27, 31; 0540-1045, MDT. Total man-hours: 21. **Census:** W. Bluebird, 7 (43, 18); Cassin's Finch, 6 (37, 15); Gray Vireo, 5 (31, 13); Chipping Sparrow, 5; Mourning Dove, 4 (25, 10); Com. Bushtit, 4; Rufous-sided Towhee, 4; Broad-tailed Hummingbird, 3 (19, 8); Cassin's Kingbird, 3; Steller's Jay, 3; Plain Titmouse, 3; Hairy Woodpecker, 2; Gray Flycatcher, 2; Scrub Jay, 2; Black-throated Gray Warbler, 2; Green-tailed Towhee, 2; White-breasted Nuthatch, 1. **Total:** 17 species; 58 males and female hummingbirds (358/km<sup>2</sup>, 145/100 acres). **Remarks:** Raptors seen hunting over the plot Sharp-shinned Hawk (4 trips), Cooper's Hawk (1), female Merlin (3). White-throated Swifts and Violet-green Swallows nested in the cliffs to the north; they frequently fed over the plot. Lesser Goldfinches were abundant during July, but there was no sign of nesting. Broad-tailed Hummingbirds did not arrive until flowers came into bloom in early July. — *JEROME L. GIFFORD, P.O. Box 85, Springdale, Utah 84767.*

**124. SAGEBRUSH FLAT.** — **Location:** Wyoming; Campbell Co., 5.4 mi W of Kingsburg Grade Road. **Continuity:** New. **Size:** 12.26 ha = 30.3 acres (surveyed and staked). **Description of Plot:** The dominant shrub species is Big Sagebrush (*Artemesia tridentata*); with lesser amounts of Prickly Pear (*Opuntia* spp.) and Rabbitbrush (*Chrysothamnus nauseosus*). Grass species consist of Blue Grama (*Bouteloua gracilis*), Needlethread (*Stipa comata*) and W. Wheat Grass (*Agropyron smithii*). A point-centered-quarter survey of the vegetation gave the following results: Individuals per acre, 1003; total percent cover, 6%. Importance percentage of major shrub species: Big Sagebrush 88%, *Opuntia* 8%, Rabbitbrush 4% **Edge:** Bordered on all sides by similar habitat. **Topography:** Flat, sloping gently S. **Elevation:** Approximately 4400 ft. **Weather:** Generally warm and clear; high temperatures 85-95°F. **Coverage:** July 13-17, 19-21 0730-0900, 0900-1030 and 1700-1900. Total man-hours: 11.53. **Census:** Brewer's Sparrow, 16 (130, 53), Vesper Sparrow, 8 (65, 26), Lark Sparrow, 7 (57, 23), W. Meadowlark, 6 (49, 20), Lark Bunting, 5 (41, 17), Sage Thrasher, 2, Savannah Sparrow, 2, Mourning Dove, 1. **Total:** 8 species; 47 territorial males or nesting pairs (383/km<sup>2</sup>, 155/100 acres). **Visitors:** Swainson's Hawk, Golden Eagle, Prairie Falcon, Am. Kestrel, Killdeer, Com. Nighthawk, Horned Lark, Cliff Swallow, Loggerhead Shrike, Brewer's Blackbird. **Remarks:** Somewhat surprising was the lack of breeding Horned Larks. Two nests found: Mourning Dove with two eggs and Com. Nighthawk with two eggs. This census was conducted in conjunction with four others in the same vicinity to investigate the correlation between species number diversity, equitability and density of breeding species with horizontal and vertical structure and composition of the vegetation. The only significant correlation found was an inverse correlation between diversity, density species number, and equitability and the importance percentage of Sagebrush. Breeding bird community structure in these five study areas was most dependent upon the occurrence of grass and shrub species other than Sagebrush rather than any differences in horizontal or vertical structure — *WILLIAM HOPPES, 300 Country Club, El Paso, Texas 79922.*

**125. CHEESEBUSH-GOLDENBUSH SCRUB.** — **Location:** California; Kern Co., Sand Canyon, in the southernmost extension of the Sierra Nevada Mtns., 12 mi N on State Hwy. 14 from intersection of State Hwys 178 and 14, then about 5 mi W on Brown Rd.; S branch of road crosses E half of plot. (On map, plot lies immediately W of the "Y" formed by the intersection of the main stream bed and the intermittent stream from the South Fork); would be SE $\frac{1}{4}$  of Sec. 1, T25S, R37E, if defined on map; Little Lake Quadrangle, USGS, 35° 47' N, 117° 56' W. **Continuity:** New. **Size:** 12.5 ha = 30.9 acres. **Description of Plot:** Plant community typical of desert-facing slopes of S Sierra Nevada Mtns.; shrubs 20-55 in. in height. Density of shrubs decreases from E to W as slope increases. Dirt road cuts through from N to S near E boundary. **Vegetation:** Three toe-point transects totaling 475 points were conducted to determine percent cover and plant composition. The substratum was composed of 62.6% bare ground, 28.5% litter, 2.3% small rocks (< 2 in.), 0.8% large rocks (> 2 in.), and 5.8% perennial shrub stems and grasses. The 25% canopy cover of shrubs was made up of 45.2% Cheesebush (*Hymenoclea salsola*), 15.1% Linear-leaved Goldenbush (*Haplopappus linearifolius*), 7.8% California Buckwheat (*Eriogonum fasciculatum*), 6.7% Sulfur-headed Buckwheat (*E. umbellatum*), 6.1% Mountain Joint Fir (*Ephedra viridis*), 5.3% Great Basin Blue Sage (*Salvia dorrii*), 3.6% dead shrubs, 2.7% Desert Needle Grass (*Stipa speciosa*), 2.5% Adonis Lupine (*Lupinus excubitus*), and less than 2% each of Cottonhorn (*Tetradymia acicularis*), Acton Encelia (*Encelia virginensis* ssp. *actoni*), Four-wing Saltbush (*Atriplex canescens*), Nevada Joint Fir (*Ephedra nevadensis*), Beavertail Cactus (*Opuntia basilaris*), Anderson Thorn Bush (*Lycium andersonii*), Eriastrum (*Eriastrum densifolium*), Terete-leaved Rubberbrush (*Chrysothamnus teretifolius*), Goldenhead (*Acamptopappus sphaerocephalus*), and Bitterbrush (*Purshia tridentata*). Cattle have grazed on the plot for decades. The eastern portion, particularly E of the road through the plot, is heavily used and consists primarily of Cheesebush, a weedy invader species. Cattle wallows are common in his part. **Edge:** Bounded on N and E by ravines with permanent streams and good stands of willows; and W boundaries are formed by rock outcrops. **Topography:** East facing slope, with severity of slope increasing from E to W. Plot very sandy, with rock outcroppings on SW boundary. A steep-sided ravine cuts upper (W) half of plot. **Weather:** Temperatures 45-94°F Light rain fell on April 30 and May 1, heavy rain on May 8 and 9. Some precipitation occurred on several other days in May. **Coverage:** May 1, 4, 11, 14, 18, 21, 24, 27, 0430-0900, PST. Total man-hours: 16. **Census:** Black-throated Sparrow, 11 (88, 36); Costa's Hummingbird, 3 (24, 10); Rock Wren, 2; Brown Towhee, 2. **Total:** 4 species; 18 territorial males (144/km<sup>2</sup>, 58/100 acres). While Black-throated Sparrow territories were distributed rather evenly over the W two-thirds of the plot, only one territory occurred E of the road. This was rather surprising since the area E of the road comprised 8.6 acres and did not seem to differ substantially in vegetational structure from the area to the W of the road. However, it is here that cattle grazing has had its greatest impact on the substratum and vegetative composition. This study was sponsored by the Bureau of Land Management, California Desert Plan Program; they provided vegetation data — *CHARLES DOCK, 1164 W. Adams Blvd., Los Angeles, Calif. 90007.*

**126. COASTAL SAGE SCRUB.** — **Location:** California, Orange Co., Starr Ranch National Audubon Sanctuary, on the S side of Pruesker Peak, 4.5 mi SE of Trabuco Canyon P.O. (5 mi N of the entrance to Ronald W Caspers Regional Park on Ortega Hwy); 33°37'17"N, 117°35'49"W, Canada Gobernadora Quadrangle, USGS. **Continuity:** New. **Size:** 9 ha = 22.24 acres (rectangular, 200 x 450 m, with long sides approximately N-S; surveyed with a theodolite and steel tape). **Description of Plot:** Costal sage scrub on E and W facing slopes of the S ridge of Pruesker Peak. A dirt fire road runs 300 m down the ridge from N to S, turns W and leaves the plot. Vegetation density and average height on the W facing slope is greater than the E facing slope. For both slopes vegetation averages 0.53 m high with 88.3% coverage. Plant species in order of dominance are: *Artemisia californica*, 35.29%; *Salvia leucophylla*, 23.51%; Poaceae species, 14.31%; *Eriogonum fasciculatum*, 13.38%; *Opuntia* sp., 9.45%. The remaining 4.06% consists of *Galium angustifolium*, *Lotus scoparius*, *Mirabilis californica*, *Rhus integrifolia*, *Salvia mellifera*, and *Yucca whipplei*. **Edge:** Bordered on all sides by coastal sage scrub similar to the plot. **Topography:** Ridge with steep slopes on each side. **Elevation:** 1480-1550 ft. **Weather:** Temperatures moderate with early morning fog on most days, clearing by mid-morning. **Coverage:** April 29-30; May 1, 5, 7, 28, 30, 0525-0848 hours, PDT. Total man-hours: 19.5. **Census:** Wrentit, 6.5 (72, 29); Rufous-crowned Sparrow, 5 (56, 22); Brown Towhee, 4.5 (50, 20); Black-chinned Sparrow, 4.5; Rufous-sided Towhee, 4 (44, 18); Bewick's Wren, 3.5 (39, 16); California Thrasher, 1.5; California Quail, 1; Cactus Wren, 1. **Total:** 9 species; 31.5 territorial males (350/km<sup>2</sup>, 142/100 acres). **Visitors:** Am. Kestrel, Mourning Dove, Black-chinned Hummingbird, Costa's Hummingbird, Anna's Hummingbird, Allen's Hummingbird, Ash-throated Flycatcher, Lazuli Bunting, Chipping Sparrow. **Remarks:** Sage Sparrows were observed, but there was no evidence of nesting. Male hummingbirds were feeding on *Salvia leucophylla* in large numbers. The only nest found was the abandoned nest of a Cactus Wren. Thanks to Pete Grisak and his Fullerton College survey class for help surveying, and to June Watanabe and Cathy Smith for their help with the vegetation analysis. — **CHARLES A. SCHNEEBECK**, Division of Life Sciences, Fullerton College, Fullerton, Calif. 92634.

**127. COASTAL SCRUB.** — **Location:** California, Marin Co., 4 mi NW of Bolinas, 0.5 mi inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 6 intermittent years. **Size:** 8.1 ha = 20 acres (approximately rectangular, 800 x 1100 ft, measured). **Description of Plot:** See AB 25: 1003-1004 (1971). **Weather:** Morning fog with 5-10 mph NW winds most census mornings. Rainfall this season (July 1976 to June 1977) 15.91 inches compared to 17.61 inches for last season was considerably below a 37.33 inch average for the previous 9 years. **Coverage:** March 25; April 13-14, 20, 28, May 4, 11, 17-18; June 8; 0615-1315 (mostly 0700-1000). Total man-hours: 23. **Census:** Wrentit, 12 (148, 60); White-crowned Sparrow, 9.5 (117, 48); Rufous-sided Towhee, 6 (74, 30); Allen's Hummingbird, 5 (62, 25); Song Sparrow, 5; Bewick's Wren, 2.5; Purple Finch, 1; House Finch, 1; Turkey Vulture, +; White-

throated Swift, +; Com. Flicker, +; Scrub Jay, +. **Total:** 12 species; 42 territorial males (519/km<sup>2</sup>, 210/100 acres). **Remarks:** One Song Sparrow nest found (unsuccessful). From a high of 20 White-crowned Sparrows in 1972, numbers of territorial males have gradually dropped to 9.5 this year. Singing male Orange-crowned Warblers were censused in 1973 (2) and 1974-75 (1 each year), but only 1 male was encountered this year. For the first time a male Purple Finch set up a territory, singing on all four May dates, but it was not subsequently encountered. No census was taken in 1976, a drought year, and, although the drought has continued into 1977, there has been no appreciable decline in the total number of territorial males. Thanks to Bob Stewart and Bruce Sorrie for their help. Contribution No. 159, PRBO. — **STUART JOHNSTON**, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

**128. CROESOTE-BRITTLEBUSH, ROCKY HILL-SIDE.** — **Location:** California; Imperial Co., Devil's Canyon area; adjacent to U.S. Hwy. 18 and 1.9 mi W of its intersection with State Hwy. 98 at Ocotillo. The NW corner is approximately 55 yards S of the highway, and the N boundary parallels the highway; E½ Sec. 4 and W½ Sec. 3, T17S, R9E of the Jacumba Quadrangle, USGS; 32°43'N, 116°03'W. **Continuity:** New. **Size:** 20 ha = 49.4 acres (irregularly rectangular, 400 x 500 m, paced). **Description of Plot:** A sparsely vegetated steep rocky slope covered with volcanic boulders up to about 18 in. in diameter, bordering the W edge of the Anza-Borrego Desert. Five 100 toe-point transects were conducted to determine percent cover and plant composition. The substratum was composed of 59.8% rocks (>2 in), 34.8% small rocks (<2 in), 3.8% litter, and 1.2% shrubs. The shrub composition was 35.8% Brittlebush (*Encelia farinosa*), 28.2% Burrobush (*Ambrosia dumosa*), 20.4% Creosote Bush (*Larrea tridentata*), 6.8% *Krameria grayi*, 2.8% White-stemmed Milkweed (*Asclepias albicans*), and 2.4% Barrel Cactus (*Ferocactus acanthodes*). Plants comprising less than 2% each of the shrub cover included *Hibiscus denudatus*, *Opuntia echinocarpa*, *Eriogonum trichopes*, *Fagonia laevis*, *Trixis californica*, *Simmondsia chinensis*, *Fouquieria splendens*, and *Dalea schottii*. There was no evidence of human use. **Edge:** The N edge parallels a highway, beyond which is typical sandy desert dominated by Creosote Bush, Ocotillo, smoke trees, and cholla; the SE corner is bordered by a sandy wash; the remainder is bounded by similar habitat. **Topography:** A steeply sloping hillside ranging from 1100 ft along the N border to approximately 1600 ft at the SW corner. A narrow, rocky arroyo runs from the middle to the N boundary; the SE corner is adjacent to a larger, sandy wash. **Water:** The nearest permanent water is at Dos Cabezas Campground, approximately 6.5 mi NW. **Coverage:** April 3, 7, 20, 27; May 2-3, 16, 19, 28; June 1; 0600-1100 and 1830-2000. Total party-hours: 28.5. **Census:** Black-throated Sparrow, 1; Com. Raven, +. **Total:** 2 species; 1 territorial male (12/km<sup>2</sup>, 5/100 acres). **Remarks:** Visitors (total recorded on 10 censuses). Mourning Dove, 5; White-throated Swift, 3; Ash-throated Flycatcher, 2; Rock Wren, 2; Red-tailed Hawk, 1; Am. Kestrel, 1; hummingbird sp., 1; Horned Lark, 1; Barn Swallow, 1; Orange-crowned Warbler, 1; Black-throated Gray Warbler, 1. This plot is 3.0 mi S of Census No. 139. It is one of the

most uninhabitable areas imaginable. Black-throated Sparrows, nesting in adjacent washes, use the plot only for feeding. The Raven nests in the foothills to the W, but forages over the plot and adjacent sandy desert daily. Even migrating passerines avoid the area, seeking shelter and food in the washes or in the sandy desert to the N. Only one unidentified lizard was seen on the plot, and there is no evidence of mammals. This survey was sponsored by the Bureau of Land Management, California Desert Plan Program. — JOSEPH R. JEHL, JR., Hubbs-Sea World Research Inst., 1700 South Shores Rd., San Diego, Calif. 92109.

## 129. CREOSOTE - GOLDENHEAD DESERT SCRUB.

**Location:** California; Kern Co., Fremont Valley; 2 mi E of Neuralia Rd., the boundary fence for the Desert Tortoise Natural Area crosses Phillips Rd., the plot begins 54 yards E of the fence and 111 yards N of wash N of Phillips Rd.; in the W½ of Sec. 30, T31S, R38E of Castle Butte Quadrangle, USGS; 35°12'N, 117°57'W. **Continuity:** New. **Size:** 36 ha = 88.96 acres (square, 600 x 600m, paced). **Description of Plot:** A rich and diverse creosote scrub community in the western Mojave Desert. Five 100 toe-point transects were conducted to determine percent cover and species composition. The substratum was composed of 40% plant litter, 29% bare ground, 4.4% small rocks (< 5 cm), and 2.6% woody plant stems. The shrub canopy cover of 8.4% was composed of 50% Creosote Bush (*Larrea tridentata*), 26 2% Goldenhead (*Acampopappus sphaerocephalus*), 11 9% Cheese Bush (*Hymenoclea salsola*), and 11.9% Burrobush (*Ambrosia dumosa*). The shrub composition is 39% Goldenhead, 33% Burrobush, 15.6% Creosote Bush, 5% Cheese Bush, 4.6% Anderson Thornbush (*Lycium andersonii*), 1.4% Cooper Goldenbush (*Haplopappus cooperi*), 0.6% Winterfat (*Eurotia lanata*), 0.4% Mojave Horsebrush (*Tetradymia stenolepis*), 0.2% Indian Rice Grass (*Oryzopsis hymenoides*), and 0.2% Wishbone Bush (*Mirabilis bigelovii*). Annuals recorded on transects were Storksbill (*Erodium cicutarium*), Desert Calico (*Langloisia matthewsii*) *Schismus* sp. and *Eriogonum* sp. Other perennial species on plot not recorded in transects were Silver Cholla (*Opuntia echinocarpa*) and Peach-thorn (*Lycium cooperi*). **Edge:** Bounded on the S by a wash 55 yards from the border and on all other sides by similar habitat. **Topography:** Slightly sloping (aspect WNW); nearest mountain slopes are the Sierra Nevada 7 mi WNW; a narrow wash crosses the extreme NE corner. **Elevation:** 2250-2275 ft. **Weather:** Skies clear on 6 days, cloudy on 2; light winds on 6 days, winds 15-30 mph on 2. **Coverage:** April 26; May 3-4, 10, 17-18, 23, 26; 0610-0930 and 1850-2020, PDST. Total: 22.2 man-hours. **Census:** Horned Lark, 13 (36, 15); Sage Sparrow, 3 (8, 3); Le Conte's Thrasher, +; Loggerhead Shrike, +. **Total:** 4 species; 16 territorial males (44/km<sup>2</sup>, 18/100 acres). **Visitors** (total number recorded on 10 censuses): Wilson's Warbler, 18; Western Kingbird, 2; Lesser Nighthawk, 2; Barn Swallow, 2; *Empidonax* sp., 2; Gray Vireo, 1. **Remarks:** One Horned Lark nest found. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — ROSS E. LANDRY, 6822 Westminster Ave #43, Westminster, Calif. 92683.

## 130. DESERT RIPARIAN.

**Location:** California; Inyo Co., E slope of the Inyo Mtns., at Willow Creek Camp 43 2 mi SE of Big Pine, along Saline Valley Road,

Sec. 2T13S, R37E. Waucoba Wash Quadrangle. **Continuity:** New. **Size:** 3.66 ha = 9.04 acres (1335 m long, mean width 27.4 m, varied from 7 to 62 m depending on width of vegetation). **Description of Plot:** The lower portion of Willow Creek; contiguous riparian vegetation from the mouth of the canyon W up 1335 m. A permanent stream cuts through the plot in an E-W direction. The water is underground for about 150 m the upper W end of the plot. The vegetation varies in density, the lower E end and upper W end contain dense stands of trees, while the middle 400 m contains sparse vegetation because of the lack of water or narrowness of the gorge. The dominant canopy trees are Red Willow (*Salix laevigata*), Narrow Leaf Willow (*S. exigua*) and Screw-bean Mesquite (*Prosopis pubescens*). An absolute count was made of the dominant canopy trees with a dbh of 7.6 cm (3 in) and over: 756 trees/study plot (207 ha = or 84/acre); total basal area 6.81 m<sup>2</sup>/ha (73.3 ft<sup>2</sup>/acre). *Salix* and *Prosopis* by diameter size class (figure after each size class number of trees); A (7.6-15.2 cm or 3-6 in.) 28 for *Salix* and 22 for *Prosopis*; B (15.2-22.9 cm or 6-9 in.) 37 for *Salix* and 34 for *Prosopis*; C (22.9-38.1 cm or 9-15 in.) 105 for *Salix* and 51 for *Prosopis*; D (38.1-53.3 cm or 15-21 in.) 93 for *Salix* and 59 for *Prosopis*; E (53.3-68.6 cm or 21-27 in.) 60 for *Salix* and 24 for *Prosopis*; F (68.6-83.8 cm or 27-33 in.) 47 for *Salix* and 40 for *Prosopis*, G (83.8-100 cm or 33-40 in.) 29 for *Salix* and 31 for *Prosopis*; H (> 100 cm or > 40 in.) 59 for *Salix* and 38 for *Prosopis*; canopy cover 80%. The upper part of the plot contains the largest trees. Their height was estimated — *Salix laevigata* 12 m and *Prosopis pubescens* 10 m. Most prominent in the understory are sapling willows, primarily *Salix exigua*. This species accounts for nearly all the understory in the lower and upper half of the plot. Mule Fat (*Baccharis glutinosa*) forms narrow groves of understory throughout the plot. Desert Baccharis (*Baccharis sergioloides*) is present but rare. Arrow-weed (*Pluchea sericea*) occurs primarily in the center, where it is dominant. Cattail (*Typha domingensis*) is present where the stream been dammed-up for drinking water. The lower half of the plot is nearly bare of all ground cover from scouring of the stream and grazing by feral burros; the majority of ground cover in the upper half is *Juncus cooperi*, which occurs in dense stands in three areas. Watercress (*Rorippa nasturtium-aquatica*), Stream Orchid (*Epipactis gigantea*), Paint Brush (*Castilleja minor*) and Bermuda Grass (*Cynodon dactylon*) make up the other components of the ground cover. In a few areas Creosote Bush (*Larrea tridentata*) and Four-wing Saltbush (*Atriplex canescens*) occur in small clumps. The walls of the canyon support only patchy vegetation with these species being noted (in order of decreasing abundance), Creosote Bush; Shadscale (*Atriplex confertifolia*), Mesquite (*Prosopis juliflora*); Indigo Bush (*Parosela schottii*); Burro Bush (*Ambrosia dumosa*) and Barrel Cactus (*Echinocactus polycephalus*). Flash floods occur frequently in the gorge. There are several areas where feral burros have trampled or grazed vegetation from ground level up to 1.5 m (5 ft) high. **Topography:** A deep narrow gorge with steep walls with a stream flowing through it; from 2700 to 2400 ft (810-720 m). **Edge:** The steep walls have components of a Creosote Bush community. **Weather:** Temperatures 55-92°F. No precipitation was recorded. **Coverage:** April 6, 13, 20, 27; May 5, 19, 26, 31; 0545-0945 Total man-hours: 32. **Census:** Mourning Dove, 22 (601, 243); House Finch, 8 (219, 88); Costa's Hummingbird (males), 5 (137, 55), Blue-gray Gnatcatcher, 5; Hooded

Oriole, 2, Black-headed Grosbeak, 2, Lesser Goldfinch, 2, Ash-throated Flycatcher, 1. **Total:** 8 species; 47 territorial males ( $1285/\text{km}^2$ , 520/100 acres). **Remarks:** The following nests were found: Mourning Dove 4; Costa's Hummingbird, 2; Blue-gray Gnatcatcher, 3; Hooded Oriole, 1; House Finch, 2, and Lesser Goldfinch, 1. A group of 10-20 feral burros used the plot regularly during censusing. I thank Michael C. Long for his assistance in identification of some of the plant species and the Bureau of Land Management staff for their assistance and suggestions. The study was supported by the Desert Plan Program, BLM. — ROBERT L. MC KERNAN, 2620 N. 40th Street, Phoenix, Ariz. 85008.

**131. DISTURBED COASTAL SAGE.** — **Location:** California; Los Angeles Co., Palos Verdes Peninsula; Portuguese Canyon from just W of fire station on Crest Rd to just E of big bend on dirt Crenshaw Blvd. at Peacock Flat, E of Peppertree Dr. into Portuguese Bend, E of Inspiration Pt.,  $33^\circ 45' \text{N}$ ,  $118^\circ 21' \text{W}$ , San Pedro Quadrangle, USGS. **Continuity:** New. **Size:** 5.57 ha = 13.77 acres (Canyon slope, 133.3 x 500 yds, as measured on aerial map, scale 1:2400). **Description of Plot:** West-facing slope of S end of canyon nearest bend on dirt Crenshaw extending 500 yds N. Portuguese Canyon was included in the 900 acres of the Portuguese Bend area, destroyed by fire in June, 1973. Vegetation is extremely dry owing to lack of rainfall this year. Dominant ground cover consists of Wild Oats (*Avena fatua*) and Foxtails (*Hordeum*) present in approximately equal abundance. Lemonadeberry (*Rhus integrifolia*), is found in lesser proportion to either the Wild Oats or Foxtails but is the predominant shrub. Valarian (*Centranthus ruber*), Bush Sunflower (*Encelia californica*) and Umbrella Plant (*Eriogonum fasciculatum*) are present in equal proportions but to a lesser extent than the Lemonadeberry. Horehound (*Marrubium vulgare*) was present only along the bottom of the canyon. Miscellaneous plant cover includes Black Sage (*Salvia mellifera*), Wild Mustard (*Brassica campestris*), and Wild Radish (*Raphanus sativus*). Distribution of vegetation determined by Line transect method. **Topography:** Elevation along slope averaging 600 ft. **Edge:** Bound on W by canyon slope with cactus as principal vegetation. **Weather:** Low morning clouds present on most trips. Temperatures 54-57°F. **Coverage:** April 2-3, 9, 16-17, 23-24; May 14-15, 17; 0600-1030. Total man-hours: 37.4. **Census:** House Finch, 10 (179, 73); Lazuli Bunting, 4 (72, 29); Bewick's Wren, 3 (54, 22); Rufous-sided Towhee, 3; Mockingbird, 2; Brown Towhee, 2; California Quail, 1; Anna's Hummingbird, 1; Com. Bushtit, 1; Scrub Jay, +. **Total:** 10 species; 27 territorial males or females ( $485/\text{km}^2$ , 196/100 acres). **Visitors:** W. Kingbird, Mourning Dove. **Remarks:** Owing to somewhat limited availability of vegetation suitable for breeding, following destruction by fire, most territories were taken by species resident to this community. Territorial males of resident species outnumbered those of summer breeding species — KERI L. ODA, 20909 Anza Ave., #246, Torrance, Calif. 90503.

**132. DISTURBED COASTAL SCRUB (A).** — **Location:** California; Marin Co., 3.5 mi NW of Bolinas, just inside the S boundary of Point Reyes National Seashore;  $37^\circ 55' \text{N}$ ,  $122^\circ 45' \text{W}$ , Bolinas Quadrangle, USGS. **Continuity:** Established 1972; 5 intermittent years. **Size:** 4.7 ha = 11.6 acres (irregular, approximately 700 x 720 ft, measured) **Description of Plot:** See AB 26: 987-988

(1972) **Weather:** Morning fog with 5-10 mph NW winds most census mornings. Rainfall this season (July 1976 to June 1977) 15.91 inches compared to 17.61 inches for last season was considerably below a 37.33 inch average for the previous 9 years. **Coverage:** April 6, 12-16, 18-19, 25, 27, 29-30; May 1, 25, 30; June 7; mostly between 0700-1200 hours. Total man-hours: 22. **Census:** White-crowned Sparrow, 4 (85, 34); Song Sparrow, 4; Wrentit, 1.5; Allen's Hummingbird, 1; Com. Bushtit, 1, Am. Goldfinch, 1; Rufous-sided Towhee, 1; Brown Towhee, 0.5; California Quail, +; Com. Flicker, +; Scrub Jay, +; Bewick's Wren, +. **Total:** 12 species; 14 territorial males ( $298/\text{km}^2$ , 121/100 acres). **Remarks:** Nests found, 3 Com. Bushtit, Am. Goldfinch, Song Sparrow. No census was taken in 1976, a drought year, and, although the drought has continued into 1977, there has been no appreciable decline in the total number of territorial males. Thanks to Bob Stewart and Bruce Sorrie. Contribution No. 158, PRBO. — STUART JOHNSTON, Point Reyes Bird Observatory, 4900 State Rt. 1, Stinson Beach, Calif. 94970.

**133. DISTURBED COASTAL SCRUB (B).** — **Location:** California; Marin Co., 3.5 mi NW of Bolinas, and 0.16 mi inside the S boundary of Point Reyes Nat'l Seashore;  $37^\circ 55' \text{N}$ ,  $122^\circ 45' \text{W}$ , Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 6 intermittent years. **Size:** 8.1 ha = 20 acres. **Description of Plot:** See AB 25:1002-1003 (1971). **Weather:** Morning fog with 5-10 mph NW wind on most census mornings. Rainfall, July 1976 to June 1977, 15.91 in. compared to 17.61 in for last season (37.33 in. average for the previous 9 years) **Coverage:** April 10, 13, 17, 20, 24, 27; May 4, 11, 18, 25, June 1; 0630-1500. Total man-hours: 20. **Census:** Song Sparrow, 7.5 (93, 38); White-crowned Sparrow, 3 (37, 15); Am. Goldfinch, 2.5; Rufous-sided Towhee, 2; Wrentit, 0.5; Allen's Hummingbird, +; Com. Flicker, +; Barn Swallow, +; Cliff Swallow, +; Scrub Jay, +; Com. Bushtit, +; W. Bluebird, +; Starling, +; Pine Siskin, +. **Total:** 14 species; 15.5 territorial males ( $192/\text{km}^2$ , 78/100 acres). **Remarks:** Nests found: Am. Goldfinch (3) all eggs taken by predators. Six of the 7.5 territorial Song Sparrows were in the 6-acre NW portion of the plot. The two-year drought in central coastal California appears to have had no impact on numbers of birds in this plot (the 4-year average, 1972-75, was 16.6 males). Contribution No. 156, PRBO. — GORDON BEEBE, Point Reyes Bird Observatory, 4900 State Rt. 1, Stinson Beach, Calif. 94970.

**134. JOSHUA TREE WOODLAND I.** — **Location:** California; Inyo and Kern Counties, Sand Canyon, in southernmost extension of the Sierra Nevada Mtns., 12 mi N on State Hwy. 14 from intersection of State Hwys 178 and 14, then about 5 mi W on Brown Rd.; SE corner of the plot is about 46 yards N of road (on map, N of the "Y" formed by the intersection of the main stream bed and the intermittent stream from the South Fork); would be SE  $\frac{1}{4}$  of Sec. 1, T2SS, R37E, if defined on map; Little Lake Quadrangle, USGS;  $35^\circ 47' \text{N}$ ,  $117^\circ 56' \text{W}$ . **Continuity:** New. **Size:** 11.9 ha = 29.4 acres. **Description of Plot:** A Joshua Tree community typical of desert-facing slopes of the Sierra Nevada Mtns. Joshua Trees (*Yucca brevifolia* var *herbertii*) are scattered over the plot, with concentrations near the center and W boundary. Two 100-pace toe-point transects were made to determine percent cover and species composition. The substratum was composed

of 72% bare ground, 14% litter, 0.5% small rocks (< 2 in), 0.5% large rocks (> 2 in), and 6% woody plant stems. The canopy cover of 13% was composed of 57.5% Burrobush (*Ambrosia dumosa*), 23% Cheesebush (*Hymenoclea salicola*), 6% California Buckwheat (*Eriogonum fasciculatum*), 5% dead shrubs, 2% Joshua trees, and 2% each of Desert Trumpet (*Eriogonum inflatum*), Spiny Hop Sage (*Grayia spinosa*), Silver Cholla (*Opuntia echinocarpa*), Beavertail Cactus (*O. basilaris*), Goldenhead (*Acampopappus sphaerocephalus*), Nevada Joint Fir (*Ephedra nevadensis*), and Desert Needle Grass (*Stipa speciosa*). The area has a long history of livestock grazing, which undoubtedly has affected the composition of the understory. On the S edge and lower slopes, the understory of small shrubs has been removed by trampling and cow trails. **Edge:** Bounded on E by Willows, on N and S by desert scrub and on W by a rather steep hill sparsely covered with pine. **Topography:** South-facing slope, cut by two shallow ravines. Substrate of decomposing granite rock is overlain with a thin layer of sand; numerous boulders lie along S boundary. **Weather:** Temperatures 45-94°F. Light rain fell on April 30 and May 1, heavy rain on May 8 and 9. Some precipitation occurred on several other days in May. **Coverage:** May 2, 5, 11, 14, 21-22, 24, 28; between 0430 and 0900, PST. Total man-hours 16. **Census:** Black-throated Sparrow, 7 (59, 24); House Finch, 6 (50, 20); Costa's Hummingbird, 2; Rock Wren, 2; Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Cactus Wren, 1; Loggerhead Shrike, 1; Scott's Oriole, 1. **Total:** 9 species; 22 territorial males (185/km<sup>2</sup>, 75/100 acres). **Visitors** (numbers indicate the total number observed): House Finch, 25; Black-headed Grosbeak, 19; Wilson's Warbler, 9; Mourning Dove, 10; *Empidonax* sp., 10; Yellow-rumped Warbler, 9; Scott's Oriole, 9; Loggerhead Shrike, 4; Lazuli Bunting, 4; Lesser Goldfinch, 2; Prairie Falcon, 1; Roadrunner, 1; Townsend's Warbler, 1. **Remarks:** Most of the breeding birds were concentrated in the portions of the plot where Joshua Trees occurred and utilized them as singing perches. This may account for the greater number of breeding species as opposed to the nearby Cheesebush-Goldenbush Plot (See Census No. 125), which lacked Joshua Trees. Rock Wrens were restricted to areas that contained boulders or rock outcroppings. The shrikes, Cactus Wrens and orioles had territories that were larger than the study area, and ranged well outside the plot. This study was sponsored by the Bureau of Land Management, California Desert Plan Program; they also provided the vegetation data. — *CHARLES DOCK, 1164 W Adams Blvd., Los Angeles, Calif. 90007.*

**135. JOSHUA TREE WOODLAND II.** — **Location:** California; San Bernardino Co., 2 mi N and 0.7 m W of Cima. The SW corner is at the BLM Bearing Tree for Sec 29, 22 yards E of Cima Rd., SW ¼ Sec. 29, T14N, R14E, Mescal Range Quadrangle, USGS; 35°16'N, 115°30'W. **Continuity:** New. **Size:** 9 ha = 22.24 acres (square, 300 x 300 m, paced, on a magnetic N compass grid). **Description of Plot:** See AB 30:1060-1061 (1976). **Weather:** A series of late cold fronts dropped temperatures to abnormally low levels. Temperatures during censuses, 55°-75°F. Skies were clear on the majority of census days. No precipitation recorded. **Coverage:** April 17, 22; May 4, 12, 20; June 2, 4, 10; 0500-0800, PST. Total man-hours: 24. **Census:** Black-throated Sparrow, 4.5 (50,20); Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Am Kestrel, +; Great Horned

Owl, +; Com. Flicker, +; Bewick's Wren, +; Bendire's Thrasher, +. **Total:** 8 species; 6.5 territorial males (72/km<sup>2</sup>, 29/100 acres). **Visitors:** Mourning Dove, Cactus Wren. **Remarks:** No nests or young were found. This census was sponsored by the Bureau of Land Management, California Desert Plan Program. — *STEVEN W. CARDIFF, 2736 Court St., Rialto, Calif. 92376.*

**136. MESQUITE-SALTBUSSH.** — **Location:** California; San Bernardino Co., Afton Canyon, 15 mi N, 17 mi E of Newberry, SE and SW ¼ of Sec. 18, T11N, R6E, Cave Mountain Quadrangle, USGS; 35°02'N, 116°23'W. **Continuity:** New. **Size:** 20.28 ha = 50.1 acres (paced) **Description of Plot:** A community typical of the drier areas adjacent to the Mojave River; mesquite and large saltbushes are intermixed with small grassy meadows and tall stands of arrowweed in the windblown sand. A 22-unit Bureau of Land Management campground occupies the SW corner. West of the campground, the vegetation consists primarily of mesquite and saltbush communities with small, grassy meadows. Four 100-pace toe-point transects were made to determine vegetative composition and percent cover. The substrata consisted of 44.1% litter, 41.4% bare ground, 7.9% woody plant stems, 5.2% small rocks (< 2 in.), and 1.4% large rocks (> 2 in.). Small and large shrubs and grasses formed a canopy cover and ground cover of 45%; the larger mesquites and willows stood 12 to 15 ft high. Composition of perennial plants included 41.7% Allscale (*Atriplex polycarpa*), 26.8% Inkweed (*Suaeda torreyana* var. *ramosissima*, *S. fruitcosa*), 18.6% Honey and Screwbean Mesquites (*Prosopis glandulosa* var. *torreyana*, *P. pubescens*), 5.1% Salt Grass (*Distichlis spicata*), 3.1% Yerba Mansa (*Anemopsis californica*), 2.7% dead shrubs, 1.4% Torrey Thornbush (*Lycium torreyi*), and lesser amounts of Alkali Goldenbush (*Haplopappus acradenioides*), Quail Brush (*Atriplex lentiformis*), and Four-wing Saltbush (*A. canescens*). Creosote Bush (*Larrea tridentata*), Catclaw (*Acacia greggii*), and Willow (*Salix gooddingii*) were present but were not in transects. Common annuals were Chinese Pusley (*Heliotropium curassavicum oculatum*), Spanish Needles (*Palafoxia linearis*), Oligomeris linifolia, *Cleomella obtusifolia*, and *Langloisia setosissima*. The campground contains several large Mesquite trees, many of which are adjacent to the camping units and have been partially destroyed or chopped down by campers seeking firewood. East of and adjacent to the campground, Arrowweed (*Pluchea sericea*) forms a dense thicket in windblown sand. **Edge:** The W edge is a rocky slope leading to a mesa 200 ft higher; the N edge is a sheer cliff leading to this same mesa; in the E, the plot grades into a stand of Tamarix (Census No. 148), and the S edge is a dirt road, beyond which lies more mesquite. **Topography:** Nearly flat, with two small hills 15 ft high in the E part. **Elevation:** 1400 ft. **Water:** The nearest water, about 100 yards N, is a large marsh with about 20 acres of open water. **Coverage:** April 11, 16, 21, 28; May 2, 5, 9, 16, 0500-0800, PST. Total party-hours: 24. **Census:** Verdins, 5 (25, 10); Phainopepla, 3 (15, 5); Mourning Dove, 2; Gambel's Quail, 1; Mockingbird, 1; Lucy's Warbler, 1. **Total:** 6 species; 13 territorial males (64/km<sup>2</sup>, 26/100 acres). **Remarks:** Habitat for birds and for other vertebrates is deteriorating. Trees are gradually being removed and shrubs, grasses, and annuals destroyed by such human-related activities as off-road vehicle use (unauthorized), littering, and development of campsites

outside designated camp units. Several dozen horses staked in the meadow on one weekend trampled the grasses severely. Shooting is common. Nest found: Lucy's Warbler, 1 (parasitized by a Brown-headed Cowbird and abandoned). — MICHAEL WEINSTEIN, and K. H. BERRY, Bureau of Land Management, 1695 Spruce St., Riverside, Calif. 92507.

**137. MESQUITE WOODLAND.** — **Location:** California, Imperial Co., approximately 14.5 mi E of Calexico on State Hwy. 98 a powerline crosses the highway; the SE corner is about 45 yards W and 22 yards N of the highway; the entire S border parallels the highway; in Sec. 31, T16S, R17E of the Calexico Quadrangle, USGS; 32°44'N, 115°15'W. **Continuity:** New. **Size:** 20 ha = 49.42 acres (rectangular, 400 × 500 m, paced). **Description of Plot:** An old mesquite woods, with trees averaging 20-25 ft in height, intermixed with Tamarisk and Creosotebush, the substrate is fine sand and is almost completely devoid of other plants. Five 100 toe-point transects were conducted to determine percent plant cover and species composition. The substratum was composed of 62.4% litter, 29.4% bare ground, and 8.2% shrub stems or tree trunks. The canopy cover of 65% was composed of 60.7% Honey Mesquite (*Prosopis glandulosa* var. *torreyana*), 32.1% Tamarisk (*Tamarix* sp.), and 7.2% Creosotebush (*Larrea tridentata*); no other shrubs were found. A dirt tract along the W border is occasionally used by vehicles, and some littering occurs along the W and S edge. Approximately 200 ft<sup>2</sup> of woods at the SW corner were burned during the survey period. **Edge:** Bounded by similar habitat to the W, but to the N and E grades into creosote bush desert; a highway borders the S edge, beyond which lies the All American Canal and an adjacent narrow belt of marsh vegetation. **Topography:** Essentially flat, with a few scattered mesquite-covered sand dunes up to 35 ft in height in the NW corner. **Elevation:** 50 ft. **Water:** The nearest permanent water is in the All American Canal, approximately 0.25 mi S of the S border. **Coverage:** March 22-23; April 8-9; May 1, 13, 20; June 1; 0515-1030, and one late afternoon trip. In addition, the area was visited after dark on 3 occasions. Total party-hours: 31. **Census:** Mourning Dove, 40 (200, 81); White-winged Dove, 20 (100, 40); Verdin, 12 (60, 24); Black-tailed Gnatcatcher, 2.5; Gambel's Quail, 2; Crissal Thrasher, 2; Ash-throated Flycatcher, 1.5; Abert's Towhee, 1.5; Ladder-backed Woodpecker, 0.5; Cactus Wren, 0.5. **Total:** 10 species; 82.5 territorial males (412/km<sup>2</sup>, 167/100 acres). **Remarks:** Large numbers of blackbirds and swallows, and occasional shorebirds passed over in nearby agricultural fields. Brown-headed Cowbirds may have nested, as up to 10 birds were regularly present; however, it is not obvious what species might be suitable hosts. The area is an important nesting ground for Mourning and White-winged Doves, as there is no similar wooded habitat nearby. Mourning Doves were present in large numbers through the entire period, but because of their erratic behavior and the impenetrable nature of the mesquite woods, it was not possible to obtain accurate census data; the actual density may be higher than indicated. White-winged Doves first appeared on the plot on May 20, when they were courting actively; a nest was found on June 1. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — JOSEPH R. JEHL, JR., Hubbs-Sea World Research Inst., 1700 South Shores Rd., San Diego, Calif. 92109

**138. MOHAVE YUCCA-STAGHORN CHOLLA DESERT SCRUB.** — **Location:** California; San Bernardino Co., SW edge of Lanfair Valley, 4.5 mi S and 1 mi E of intersection of Ivanpah and Cedar Canyon Rds., roughly parallel to Ivanpah Rd. (the SW corner is about 270 yards NW of where Ivanpah Rd. crosses Fenner Wash); NE 1/4 Sec. 5, T11N, R17E, Lanfair Valley Quadrangle, USGS; 35°04'N, 115°10'W. **Continuity:** New. **Size:** 20/km<sup>2</sup> ha = 49.42 acres (rectangular, 400 × 500 m, paced, the length running N-S on a magnetic N compass grid). **Description of Plot:** A unique habitat type of very limited distribution on the Mohave Desert of California, few areas have taller or denser stands of Mohave Yucca and Staghorn Cholla. One 264-pace toe-point transect was made to determine percent cover and species composition. The substratum was composed of 11.7% small rocks (< 2 in), 3.8% large rocks (> 2 in), 58.3% bare ground, 13.3% dead plant litter, and 12.9% shrub stems and plant cover. Plant composition was 27.3% California Buckwheat (*Eriogonum fasciculatum*), 16% Cooper Goldenbush (*Haplopappus cooperi*), 9% Little-leaved Ratany (*Krameria parvifolia*), 8.3% Staghorn Cholla (*Opuntia acanthocarpa*), 8% Cottonthorn (*Tetradymia axillaris*), 7.2% Paperbag Bush (*Salazaria mexicana*), 7.2% Mohave Yucca (*Yucca schidigera*), 5.7% Darning Needle Cholla (*O. ramosissima*), 3.4% Cheesebush (*Hymenoclea salsola*), and 2.3% Catclaw (*Acacia greggii*). Other shrubs present in lesser amounts were: Burrobush (*Ambrosia dumosa*), Creosotebush (*Larrea tridentata*), Purple Sage (*Salvia dorrii*), and Strawberry Hedgehog Cactus (*Echinocereus engelmannii*). A long history of livestock grazing has affected percent cover and plant composition. **Edge:** A lightly traveled dirt road and small powerline parallel the study area 110 yards W. A large Acacia-Desert Willow wash runs NW-SE about 20 yards from the SW corner. A smaller wash passes N-S through the E half and an old narrow gauge railroad bed runs roughly N-S through the middle. Similar habitat surrounds the plot for short distances to the S and W and for longer distances to the N and E. **Topography:** Flat and slightly sloping upwards to the N. Several small to moderately large washes show 10-15 ft of vertical relief below the general surface level; elevation 3630-3680 ft. The Hackberry Mountains and Vontrigger Hills lie about 0.5 mi SW and SE, respectively, and the Bobcat Hills lie 0.5 mi N. **Water:** The nearest surface water is at a stock watering trough 540 yards S of the plot. **Weather:** Clear during most censuses. Temperatures, 50-75°F, averaged colder than usual. Significant precipitation fell during the second week of May. **Coverage:** April 24; May 3, 11, 14, 18, 25; June 3, 8; from 0500-0800, PST. Total man-hours: 24. **Census:** Cactus Wren, 2.5; Gambel's Quail, 2; Black-throated Sparrow, 1.5; Roadrunner, 1; Costa's Hummingbird, 1; Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Bendire's Thrasher, 1; Scott's Oriole, 1; Am. Kestrel, +; Mourning Dove, +; Say's Phoebe, +; Verdin, +; Black-tailed Gnatcatcher, +; House Finch, +. **Total:** 15 species; 12 territorial males (60/km<sup>2</sup>, 24/100 acres). **Remarks:** No nests were found and no juvenile birds were observed except for one juvenile Am. Kestrel. It is possible that the unusually cold weather may have delayed nesting activity. Cattle were seen on the plot on May 14, 18, and 25. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — STEVEN W. CARDIFF, 2736 Court St., Rialto, Calif. 92376.

### 139. OCOTILLO-CREOSOTEBOUSH SCRUB. —

**Location:** California; Imperial Co., Ocotillo; on the N side of State Hwy. S-2, 4.2 mi NW of its intersection with U S Hwy. 18. The SE corner is 0.5 mi W of a paved road leading N from S-2 to an active gravel pit, and 22 yards N of the highway; the S boundary parallels the highway; entirely enclosed in Sec. 20, T16S, R9E of the Carrizo Mts Quadrangle, USGS; 32°46'N, 116°03'W. **Continuity:** New. **Size:** 20 ha = 49.42 acres (rectangular, 400 x 500 m, paced). **Description of Plot:** An Ocotillo-Creosotebush desert scrub area typical of the Anza-Borrego Desert. Five 100-pace toe-point transects were conducted to determine percent cover and species composition. The substratum consisted of 50.6% bare sandy ground, 30.8% litter, 2.6% small rocks (< 2 in.), 1.4% large rocks (> 2 in.), and 14.6% perennial shrubs. The canopy cover of 14.6% was composed of 46% Ocotillo (*Fouquieria splendens*), 39% Creosotebush (*Larrea tridentata*) and 16% Burrobush (*Ambrosia dumosa*). Shrub composition is 36.6% Burrobush, 17.6% Brittlebush (*Encelia farinosa*), 14.4% Creosotebush, 10.2% Ocotillo, 6.0% *Coldenia* sp., 5% *Krameria grayi*, and 4.8% Rose-mallow (*Hibiscus denudatus*). Species comprising less than 2% each of the shrub cover include: *Hilaria rigida*, *Eriogonum trichopes*, *Opuntia echinocarpa*, *Brickellia arguta*, *Dalea spinosa*, and *Ferocactus acanthodes*. A narrow track paralleling the S boundary is occasionally used by off-road vehicles. **Topography:** Slightly sloping. The nearest mountain slopes are 2.5 mi to the NE in the Coyote Mtns. **Elevation:** 720-760 ft. **Water:** The nearest water is at Dos Cabezas campground, approximately 5 mi SW. **Edge:** Bounded by similar habitat, except for the highway paralleling the S edge. **Coverage:** March 22, 25; April 2, 6, 20, 30; May 4, 12, 27; June 1; Total: 11 trips 0600-1000; 2 in afternoon, 1 at sunset. Total party-hours: 22 **Census:** Costa's Hummingbird, 1; Loggerhead Shrike, 1; Cactus Wren, 0.5; Black-throated Sparrow, 0.5 **Total:** 4 species; 3 territorial males (15/km<sup>2</sup>, 6/100 acres) **Visitors:** (total number recorded on 11 censuses): Brewer's Sparrow, 70; Lark Bunting, 19; House Finch, 18, Yellow Warbler, 4; Mourning Dove, 3; Horned Lark, 3, Townsend's Warbler, 3; Wilson's Warbler, 3; N. Oriole, 3; Red-tailed Hawk, 2; Com. Raven, 2; W. Tanager, 2; White-crowned Sparrow, 2; Prairie Falcon, 1; Gambel's Quail, 1; Rufous Hummingbird, 1; Western Flycatcher, 1; Barn Swallow, 1; Swainson's Thrush, 1; Orange-crowned Warbler, 1; Hermit Warbler, 1; Yellow-rumped Warbler, 1; Black-headed Grosbeak, 1; Lark Sparrow, 1. Although only a few birds were resident, the area seems potentially important as a stopping place for migrating finches, particularly Brewer's Sparrow. This survey was sponsored by the Bureau of Land Management, California Desert Plan Program. — **JOSEPH R. JEHL, JR., Hubbs-Sea World Research Inst, 1700 South Shores Rd., San Diego, Calif. 92109.**

**140. RABBITBRUSH. — Location:** California; Inyo and Kern Cos., Sand Canyon, in the S extension of the Sierra Nevada Mtns., 12 mi N on State Hwy. 14 from intersection of State Hwys. 178 and 14, then 3.5 mi W on Brown Rd.; from center of Sec. 7, T25S, R38E, up the canyon following the main stream approximately 1.4 mi; Little Lake Quadrangle, 1954, USGS; 35°47'N, 117°56'W. **Continuity:** New. **Size:** 6 ha = 14.8 acres. **Description of Plot:** Canyon bottom with constant stream. Canyon begins on the E face of the Sierra Nevada (desert face) and has an E-W direction, opening into the Mojave

Desert. The plot lies immediately adjacent and parallel to a willow-riparian area (Census No. 97) where the streambed and flood plain are relatively flat. The plot is 30 to 90 ft wide and 1.4 mi long. Censuses were made by following a cattle trail which parallels the stream. On the E boundary, the trail extends for 500 ft on the N side of the stream, then crosses to the S side for .7 mi, finally crossing N again. Two 450-pace tow-point transects were made to determine composition of substratum and perennial vegetation and percent cover. The substratum was composed of 47% perennial shrub stems, 27.5% litter, 23.4% small rocks (< 2 in.), and 2.1% large rocks (> 2 in.). The canopy cover of 50.9% was composed of 52.2% Rabbitbrush (*Chrysothamnus nauseosus*), 22.7% Rabbitbrush with California Grape (*Vitis girdiana*), 13.9% California Grape, 4.8% Sagebrush (*Artemesia ludoviciana* ssp. *albula*), 3.4% mixed Rabbitbrush and Sagebrush, and lesser amounts of Paper-bag Bush (*Salazaria mexicana*), Squaw Waterweed (*Baccharis sergoloides*), Desert Alyssum (*Lepidium fremontii*), Cheesebush (*Hymenoclea salsola*), Anderson Thornbush (*Lycium andersonii*), and Sticky-leaved Rabbitbrush (*C. viscidiflorus*). The composition was 50.4% Rabbitbrush, 16.4% California Grape, 7.4% Sagebrush, 5.4% Cheesebush, 3.5% Desert Alyssum, 3.1% Linear-leaved Goldenbush (*Haplopappus linearifolius*), 2.2% Sticky-leaved Rabbitbrush, and lesser amounts of such species as Four-wing Saltbush (*Atriplex canescens*), California Buckwheat (*Eriogonum fasciculatum*), Paper-bag Bush, Desert Trumpet (*E. inflatum*), Great Basin Blue Sage (*Salvia dorii*), Adonis Lupine (*Lupinus excubitus*), Wild Peach (*Prunus andersonii*), and Acton Encelia (*Encelia virginicensis* var. *actoni*). The streamside area, used heavily by livestock for decades, has numerous cattle trails. Cattle have undoubtedly had an impact: perennial bunch grasses are represented only as a trace with Desert Needle Grass (*Stipa speciosa*). There is also a little Salt Grass (*Distichlis spicata*). Several other species of grass should occur here. Many of the shrubs are typical of disturbed areas: Rabbitbrush, Desert Alyssum, Linear-leaved Goldenbush, Cheesebush, and Paper-bag Bush. **Topography:** Relatively flat, gradually gaining elevation from E to W. **Elevation:** Ranges from 3200 ft in the E to 3760 ft in the W. **Weather:** Temperatures 45-94°F. Light rain fell on April 30 and May 1, heavy rain on May 8 and 9. Some precipitation occurred on several other days in May. **Coverage:** April 16-17, 23; May 12, 19-20, 23, 26, 0430-0830, PST. Total man-hours: 32. **Census:** There were no breeding birds. **Visitors:** (number indicates the total number observed): Mourning Dove, 99; White-crowned Sparrow, 36; California Quail, 34; *Empidonax* sp., 10; Brown Towhee, 9; Costa's Hummingbird, 8; House Finch, 6; Yellow-rumped Warbler, 4; Ash-throated Flycatcher, 3; Scrub Jay, 3; Wilson's Warbler, 3; Poor-will, 1; Barn Swallow, 1; Loggerhead Shrike, 1; W. Tanager, 1; Black-headed Grosbeak, 1; Lesser Goldfinch, 1; Black-throated Sparrow, 1. **Remarks:** California Quail were possibly breeding on the plot; all other species appeared to be using the plot purely for foraging or cover. The species composition of this study is dominated by ground-foraging seed-eating birds. Seeds from Rabbitbrush and/or associated plants within this vegetation type may be a significant food source for wintering and migrating species. Several species listed nest in the adjacent willows, and some individuals may have been counted for both plots. Estimates for some species (e

California Quail and White-crowned Sparrows) may be low because of their secretive habits or their tendency to flock. This study was sponsored by the Bureau of Land Management, California Desert Plan Program; they also provided the vegetation data. — CHARLES DOCK, 1164 W. Adams Blvd., Los Angeles, Calif. 90007.

**141. SAGEBRUSH SCRUB I.** — **Location:** California, Inyo Co., Waucoba Wash, 1 mi E of Waucoba Canyon, 31.2 mi SE of Big Pine; along Saline Valley Rd.; Sec. 8, T11S, R37E, Waucoba Spring Quadrangle, USGS; 37°00'N, 117°57'W. **Continuity:** New. **Size:** 21 ha = 51.9 acres (rectangular, 350 m E-W x 600 m N-S).

**Description of Plot:** A typical sagebrush community of the N Mojave Desert. Five 100-pace toe-point transects were conducted to determine percent cover and species composition. The substratum was composed of 47.2% bare ground, 29.8% small rocks (< 5 cm), 13.6% large rocks (> 5 cm), 8.8% plant litter, and 0.6% shrub stems. The shrub canopy cover of 13.2% was composed of 71% Big Sagebrush (*Artemisia tridentata*), 8% Cotton-thorn (*Tetradymia spinosa*), 6% Spiny Hop-Sage (*Grayia spinosa*), 4.5% Black Sagebrush (*A. nova*), 4.5% Nevada Joint Fir (*Ephedra nevadensis*), 1.5% Winter Fat (*Eurotia lanata*), 1.5% Bud Sagebrush (*A. spinescens*), 1.5% Anderson Thornbush (*Lycium andersonii*) and 1.5% Blackbrush (*Coleogyne ramosissima*). Shrub composition is 71.6% Big Sagebrush, 9% Nevada Joint Fir, 6.4% Cotton-thorn, 5.6% Black Sagebrush (*A. nova*), 2.2% Spiny Hop-Sage, 2.2% Bud Sagebrush, 1.6% Winter Fat and 1.4% Blackbrush. Other perennial species occurring but not recorded in transect were: Linear-leaved Goldenbush (*Haplopappus linearifolius*), Shadscale (*Atriplex confertifolia*), Terete-leaved Rubberbrush (*Chrysothamnus teretifolius*), and Antelope Bush (*Purshia glandulosa*). This area is heavily grazed by feral burros. **Topography:** Slopes gently W to E; one wash (Waucoba Wash) cuts through in a N-S direction. **Elevation:** 5800-6000 ft. **Water:** The nearest permanent water is at Waucoba Spring, 0.5 mi W of the plot. **Edge:** Surrounded by similar habitat. **Coverage:** April 14, 18, 21, 25; May 3, 10, 17, 24; 0600-0900. Total man-hours: 24. **Census:** Black-throated Sparrow, 2; Rock Wren, 1; Loggerhead Shrike, 1. **Total:** 3 species; 4 territorial males (19/km<sup>2</sup>, 8/100 acres). **Visitors:** White-crowned Sparrow, 4; Mourning Dove, 3. **Remarks:** This is one of a pair of plots (see Census No. 142 for control) established to study the effects of feral burros on vertebrates. A group of 15-18 burros used this plot continuously, scarring the substratum by dust bathing and wallowing. The vegetation was heavily grazed, and there was essentially no annual plant cover, only stubs or exposed roots. The control plot showed twice the number of territorial males. Special thanks to Bureau of Land Management staff for their assistance and suggestions. The study was supported by the BLM, California Desert Plan Program. — ROBERT L. MC KERNAN, 2620 N. 40th St., Phoenix, Ariz. 85008.

**142. SAGEBRUSH SCRUB II.** — **Location:** California, Inyo Co., 1 mi N of Marble Canyon, 21.1 mi SE of Big Pine; along Saline Valley Rd.; Sec. 12, T10S, R36E, Waucoba Spring Quadrangle, USGS; 37°5'N, 118°0'W. **Continuity:** New. **Size:** 21 ha = 51.9 acres (rectangular, 350 m E-W by 600 m N-S). **Description of Plot:** A typical Sagebrush community of the N Mojave Desert. Five 100-pace toe-point transects were conducted to determine

percent cover and species composition. The substratum was composed of 63.2% small rocks (< 5 cm), 18.8% bare ground, 7.8% large rocks (> 5 cm), 7.2% plant litter, and 3% shrub stems. The shrub canopy cover of 24.8% was composed of 82.2% Big Sagebrush (*Artemisia tridentata*), 5% Nevada Joint Fir (*Ephedra nevadensis*), 4% Spiny Hop-Sage (*Grayia spinosa*), 3.2% Bud Sagebrush (*A. spinescens*), 2.4% Blackbrush (*Coleogyne ramosissima*), 1.6% Anderson Thornbush (*Lycium andersonii*), 1.6% Black Sagebrush (*A. nova*). Shrub composition was 77% Big Sagebrush, 6% Bud Sagebrush, 4% Black Sagebrush (*A. nova*), 3% Mountain Joint Fir (*Ephedra viridis*), 3% Nevada Joint Fir, 3% Spiny Hop-Sage, 2% Cotton-thorn (*Tetradymia spinosa*), 1% Anderson Thornbush (*Lycium andersonii*) and 1% Four-wing Saltbush (*Atriplex canescens*). Other perennial species occurring but not recorded in transects were: Linear-leaved Goldenbush (*Haplopappus linearifolius*), Shadscale (*Atriplex confertifolia*), Antelope Bush (*Purshia glandulosa*), Terete-leaved Rubberbrush (*Chrysothamnus teretifolius*) and Mojave Desert Mallow (*Sphaeralcea pulchella*). **Topography:** Slightly sloping alluvial plain with several shallow washes crossing in W to E direction, elevation 6000-6200 ft. **Edge:** Similar habitat on all sides. **Coverage:** April 12, 19, 26, 29; May 4, 11, 18, 25, 0600-0900. Total man-hours: 24. **Census:** Black-throated Sparrow, 4 (19, 8); Loggerhead Shrike, 2; Chukar, 1; Rock Wren, 1; Say's Phoebe, +. **Total:** 5 species, 8 territorial males (38/km<sup>2</sup>, 15/100 acres). **Visitors:** Mourning Dove, 4; Am. Kestrel, 1. **Remarks:** Nests found Chukar, 1; Loggerhead Shrike, 1; Rock Wren, 1; Black-throated Sparrow, 1. This plot was a control plot for Census No. 141, to study the effects of feral burros on breeding bird populations. There was no sign of grazing by any ungulates. A special thanks to Bureau of Land Management staff for their assistance and suggestions. The study was supported by the BLM, California Desert Plan Program. — ROBERT L. MC KERNAN, 2620 N 40th St., Phoenix, Ariz. 85008.

Censuses 143 and 144 have been withdrawn from publication.

**145. SALTBUCK DESERT.** — **Location:** California, San Bernardino Co.; Cuddeback Lake. The E border of the plot is 333 yards into the saltbush from the edge of the dry lake; 0.5 mi S of Twenty Mule Team Parkway and 8.5 mi E of U.S. Hwy 395; in the SW ¼ of Sec. 23, T30S, R42E, the NW ¼ of Sec. 33, the NE ¼ Sec. 32, and the SE ¼ Sec. 29, T30S, R43E, of Cuddeback Lake Quadrangle, USGS; 35°17'N, 117°29'W. **Continuity:** New. **Size:** 36.0 ha = 88.96 acres (square, 600 x 600 m, paced). **Description of Plot:** Low profile, diverse saltbush community at the edge of a dry lake. Five 100 toe-point transects were conducted to determine percent cover and species composition. The substratum was composed of 63.2% bare ground, 1% plant litter, 2.8% small rocks (< 5 cm), and 3% woody plant stems. The shrub canopy cover of 11.2% was composed of 66.2% Parry Saltbush (*Atriplex parryi*), 12% Shadscale (*Atriplex confertifolia*), 8.2% Burroweed (*Ambrosia dumosa*), 3.2% Anderson Thornbush (*Lycium andersonii*), 2.8% Bald-leaved Felt-thorn (*Tetradymia glabrata*), 2.8% Bud Sagebrush (*Artemisia spinescens*), 2.2% Spiny Hop Sage (*Grayia*

*spinosa*), 1.2% Prince's Plume (*Stanleya pinnata*), 0.8% Winterfat (*Eurotia lanata*), and 0.6% Goldenhead (*Acamptopappus sphaerocephalus*). Annual species recorded in transects were Storksbill (*Erodium cicutarium*), Yellow-throats (*Phacelia fremontii*), *Chaenactis carphoclinia*, *C. fremontii*, *Nama demissum*, Desert Calico (*Langloisia matthewsii*), Sand Mat (*Euphorbia polycarpa*), *Eriastrum pluriflorum*, *camissonia boothii*, gold-fields (*Lasthenia chrysostoma*), *Schismus* sp. and 3 species of *Eriogonum*. **Edge:** Bounded on all sides by similar habitat. Cuddeback Dry Lake begins 333 yards from the E border. **Topography:** Slightly sloping (aspect NW); nearest mountain slopes Almond Mountain 5.8 mi N. **Elevation:** 2560 ft. **Weather:** Skies clear on 4 days, cloudy on 2; light rains on April 12, heavy rains on April 24. Light winds on 6 days, over 15 mph on 2 days. **Coverage:** April 27; May 5, 11-12, 16, 19, 24-25; 0616-0915, and 1930-2035. **PDST:** Total: 20.4 man-hours. **Census:** Sage Sparrow, 17 (47, 19); Horned Lark, 6 (17, 7). **Total:** 2 species; 23 territorial males ( $64/\text{km}^2$ , 26/100 acres). **Visitors** (total number recorded on 10 censuses): Barn Swallow, 11; Black-headed Grosbeak, 2; Mourning Dove, 2; Wilson's Warbler, 1; Brewer's Sparrow, 1. This study was sponsored by the Bureau of Land Management, California Desert Plan Program. — ROSS E. LANDRY, 6822 Westminster Ave. #43, Westminster, Calif. 92683.

#### 146. SCRUB OAK-DESERT CHAPARRAL. —

**Location:** California; Imperial Co., Smuggler's Cave; approximately 222 yards SW of the turnout to In-Ko-Pah Co (San Diego) Park, on U.S. Hwy. 8, a winding dirt road leads SE, climbing about 500 ft before descending into a sheltered valley (Smuggler's Cave) approximately 1 2/5 mi from the highway. The valley trends NW-SE, and the NW border traverses the NW end of the valley floor. The long axis follows the center of the valley; in Sec. 5, T18S, R9E, Jacumba Quadrangle, USGS, 32°38'N, 116°05'W. **Continuity:** New. **Size:** 20 ha = 49.42 acres (rectangular, 400 x 500 m, paced). **Description of Plot:** An ecotonal situation lying between the Anza-Borrego Desert and a narrow strip of Pinyon-Juniper Woodland. Five 100 toe-point transects were conducted to determine percent cover and species composition. The substratum was composed of 48% litter, 21.4% bare ground, 5.4% small rocks (< 2 in), 13.2% rocks (> 2 in). There was a canopy cover of 11.8%, composed of 51.9% Scrub Oak (*Quercus turbinella*), 19.2% Sugar Bush (*Rhus ovata*), 17.3% Desert Apricot (*Prunus fremontii*), 7.7% Catclaw (*Acacia greggii*), 1.9% Mohave Yucca (*Yucca schidigera*), and 1.9% Hollyleaf Coffeeberry (*Rhamnus ilicifolia*). Shrub composition was 18.8% California Buckwheat (*Eriogonum fasciculatum*), 12% Scrub Oak, 10% Desert Apricot, 7% Deerweed (*Lotus scoparius*), 7% Acton Encelia (*Encelia virginensis*), 6.9% Desert Needle Grass (*Stipa speciosa*), 6.6% Matchweed (*Gutierrezia microcephala*), 4.6% Sugar Bush, 4.0% Chamise (*Adenostoma fasciculatum*), 3.4% Jumping Cholla (*Opuntia bigelovii*) 3.2% Mohave Yucca (*Yucca schidigera*), 2.8% Golden Yarrow (*Eriophyllum confertiflorum*), unidentified dead shrubs, and various shrubs each comprising less than 2% One-leaved Pinyon (*Pinus monophylla*) and Juniper (*Juniperus californica*) occur but were not recorded in the toe-point transects. The plot is traversed by a dirt road, used intensively by off-road vehicles (ORVs) on weekends, some ORV activity also occurs in sandy washes in the W half. **Edge:** Bounded by generally similar vegeta-

tion, although to the NE the vegetation grades into the sparse vegetation of the barren desert slopes; on the higher ridge to the SW the chaparral is denser and there are occasional pinyons and junipers. **Topography:** The valley floor is composed of gently undulating hills and occasional boulder outcrops, and is traversed by several arroyos. The NE (desert) side of the valley is bordered by a steep and sparsely vegetated rock ridge; the SW side rises to 4000 ft and is well vegetated. **Elevation:** 3600-3700 ft. **Water:** The nearest permanent water is apparently in the In-Ko-Pah County Park, approximately 2 mi to the NW. **Coverage:** April 3, 5-6, 27; May 2, 5, 17, 31, June 6; 0545-1130 and 1600-2130. Total party-hours 30. **Census:** Black throated Sparrow, 4 (20, 8); Ash-throated Flycatcher, 2.5; Cactus Wren, 2.5; California Quail, 2, Rock Wren, 2; California Thrasher, 2; Scott's Oriole, 1.5; Costa's Hummingbird, 1; Scrub Jay, 1; Loggerhead Shrike, 1; Ladder-backed Woodpecker, 0.5; Bewick's Wren, 0.5; Black-tailed Gnatcatcher, 0.5; Great Horned Owl, +; Com. Raven, +; House Finch, +. **Total:** 16 species; 21 territorial males ( $105/\text{km}^2$ , 42/100 acres) This survey was sponsored by the Bureau of Land Management, California Desert Plan Program. — JOSEPH R. JEHL, JR., Hubbs-Sea World Research Institute, 1700 South Shores Rd., San Diego, Calif 92109.

#### 147. TAMARISK-DESERT RIPARIAN. —

**Location:** California; San Bernardino Co., Mojave River in Afton Canyon; from 17 to 17.4 mi E and 14.6 mi N of Newberry and from the Union Pacific railroad tracks on the N to the canyon walls on the S, SE $\frac{1}{4}$  Sec. 13, T11N, RSE, to SW $\frac{1}{4}$  Sec. 18, T11N, R6E, Cave Mtn. Quadrangle, USGS; 35°02'N, 116°24'W. **Continuity:** New. **Size:** 35 ha = 86.4 acres. **Description of Plot:** A desert marsh community surrounded by Tamarisk, Mesquites, Catclaw and Saltbush in the streambed and floodplain of the Mojave River. The vegetative community is a complex mixture of four habitat types: marsh with open water, stands of rushes and cattails; a dense woodland of Tamarisk trees; and mixed Mesquite and Saltbush with hummocks of windblown sand. Approximately 20 acres of open water occur on the NE corner. Marsh vegetation in and surrounding the open water is composed of Cattail (*Typha angustifolia*), Three-square (*Scirpus americanus*), Hard-stem Bulrush (*S. acutus*), Basket Rush (*Juncus tenuis*), Salt Grass (*Distichlis spicata*), Bermuda Grass (*Cynodon dactylon*), Rabbitfoot Grass (*Polypogon monspeliensis*), Com. Reed (*Phragmites australis*), and Arrowweed (*Pluchea sericea*). To the immediate S and partially within the standing water is a large, dense and almost impenetrable stand of Tamarisk (*Tamarix aphylla*) averaging 20 ft in height, with scattered Linear-leaved Cambess (*Oligomeris linifolia*) in the mud beneath the trees. Scattered Willow (*Salix gooddingii*), Cottonwood (*Populus fremontii*) and Desert Willow (*Chilopsis linearis*) make up a trace of the dense vegetation. To the immediate W (upstream) of the open water in the NW corner are pockets of marsh vegetation in the old stream bed. Vegetation here is composed primarily of Cattails, Three-square, Basket Rush, Yerba Mansa (*Anemopsis californica*), Chinese Pusley (*Heliotropium curassavicum oculatum*), Water Parsnip (*Berula erecta*), Mule Fat (*Baccharis glutinosa*), and Salt Grass. The SE corner is on the more arid floodplain and is primarily a Mesquite-Saltbush community. Large Honey and Screw-

bean Mesquites (*Prosopis glandulosa* var. *torreyana*, *P. pubescens*), Tamarisk (several species, such as *T. aralensis*), Catclaw (*Acacia greggii*), Creosotebush (*Larrea tridentata*), and California Joint Fir (*Ephedra californica*) dominate the area; other perennial species include Quail Brush (*Atriplex lentiformis*), Allscale (*A. polycarpa*), Jimson Weed (*Datura meteloides*), Honey Sweet (*Tidestromia oblongifolia*), Palmate-leaved Gourd (*Cucurbita palmata*), and Russian Thistle (*Salsola* sp.). This study area is a control plot for the Mesquite-Saltbush, and Desert Marsh plots combined (Census No. 136, 148, and 164, respectively, all of which have moderate to heavy recreational use. The size is comparable to the 82.7 acres in the other 3 plots. There is little human impact from recreation, but campers and motorcyclists are beginning to use the Mesquite and Saltbush on the W and SW corners. **Topography:** Essentially a flat portion of the Mojave River streambed and floodplain, slightly sloping downhill from S to N. **Elevation:** 1400 ft. **Edge:** Bounded on the N by Union Pacific railroad tracks, on the E by a sandy, barren wash flowing out of the Cady Mtns., on the S by a steep bluff of the Cady Mtns; and on the W by an ill-defined dirt road running approximately NNW-SSE toward the bluff of the Cady Mtns. **Weather:** A series of late cold fronts during May kept temperatures lower than normal. Skies were mostly clear or partly cloudy during censuses. Temperatures 40-90°F (averaged in the 60's and 70's); with light to moderate W winds. Significant precipitation fell May 23-24. **Coverage:** April 10, 17, 24; May 1, 9, 16, 23, 28; from 0500-0900, PST. Total man-hours: 32. **Census:** Red-winged Blackbird, 9 (26, 10), Am. Coot, 5 (14, 6); Mourning Dove, 4 (11, 5); Verdin, 4; Brown-headed Cowbird, 4; House Finch, 3 (9, 3); Gambel's Quail, 1; Virginia Rail, 1; Com. Gallinule, 1; Killdeer, 1; Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Yellow-breasted Chat, 1; Blue Grosbeak, 1; Red-tailed Hawk, +; Prairie Falcon, +; Am Kestrel, +; Roadrunner, +; Lesser Nighthawk, +; White-throated Swift, +; Say's Phoebe, +; Com. Raven, +; Rock Wren, +. **Total:** 23 species; 37 territorial males and females (106/km<sup>2</sup>, 43/100 acres). **Remarks:** One nest each was found of Mourning Dove, Ladder-backed Woodpecker, Ash-throated Flycatcher and Verdin. Virginia Rail, Com. Gallinule, Am. Coot and Red-winged Blackbird were seen with juveniles freshly out of the nest. Red-tailed Hawk, Am. Kestrel, Lesser Nighthawk, White-throated Swift, Say's Phoebe, Com. Raven and Rock Wren nest on the nearby cliffs and hillsides and were seen foraging on or over the plot. Costa's Hummingbird and Phainopepla undoubtedly nest here but were through before the census period. — *EUGENE A. and STEVEN CARDIFF and K. H. BERRY, California Desert Plan Program, Bureau of Land Management, 1695 Spruce St., Riverside, Calif. 92507.*

**148. TAMARISK-SALTBUSH.** — **Location:** California, San Bernardino Co., Afton Canyon, 15 mi N, and 17 mi E of Newberry; SE<sup>1/4</sup> Sec. 18, T11N, R6E, Cave Mtn. Quadrangle, USGS; 35°02'N, 116°23'W. **Continuity:** New. **Size:** 18.5 ha = 45.7 acres (paced). **Description of Plot:** Part of the floodplain of the Mojave River; now primarily dry ground but containing a few small washes with marsh-type vegetation and standing water. The main channel of the Mojave River lies a few 100 ft S, but could easily reflood and rechannel the plot. Vegetation: A Tamarisk-Saltbush community. Five toe-point tran-

sects (total 850 paces) were made to determine species composition and percent cover. The substratum consists of 41.5% bare ground, 37.2% litter, 11.4% perennial plant stems, 5.2% large rocks (> 2 in), and 4.7% small rocks (< 2 in). The canopy cover varies considerably, with a dense woodland of Tamarisk on the W and N to relatively low open desert scrub with scattered large shrubby Tamarisk in the E. The S portion is generally of low shrubs and has a low percent cover. The canopy cover of plants ranges from 63.6% to 12.3% (5 transects), average 31.5% and is composed of 32.4% Arrowweed (*Pluchea sericea*), 30.3% Tamarisk (*Tamarix aphylla*, *T. parvifolia*, *T. ramosissima*), 10.8% Salt Grass (*Distichlis spicata*), 5.5% Quail Brush (*Atriplex lentiformis*), 3.9% Honey Sweet (*Tidestromia oblongifolia*), 2.4% Catclaw (*Acacia greggii*), and lesser amounts of Honey and Screw-bean Mesquite (*Prosopis glandulosa* var. *torreyana*, *P. pubescens*), Creosotebush (*Larrea tridentata*), Cottonwood (*Populus deltoides*), Black-banded Rabbit Brush (*Chrysothamnus paniculatus*), Hard-stem Bulrush (*Scirpus acutus*), Three-square (*S. americanus*), Cattail (*Typha angustifolia*), Olney's Bulrush (*S. olneyi*), Basket Rush (*Juncus textilis*), Baltic Rush (*J. balticus*), Desert Panicum (*Panicum urvilleanum*), Sand Dropseed (*Sporobolus cryptandrus*), Liquorice (*Glycyrrhiza lepidota* var. *glutinosa*), and Rabbitfoot Grass (*Polygogon monspeliensis*). There is also Cleveland Tobacco (*Nicotiana cleve-landii*), Russian Thistle (*Salsola paulsenii*), Walker Primrose (*Camissonia walkeri*), Kidney-leaved Buckwheat (*Eriogonum reniforme*), and Silver Lake Daisy (*Machaeranthera arida*). **Edge:** Bounded on the E by like habitat, on the S by Desert Marsh (Census No. 164), on the N by sheer cliffs, and on the W by Mesquite-Saltbush (Census No. 136). **Topography:** Generally flat floodplain of the Mojave River, with old stream courses, 610 ft deep, running through the plot. **Elevation:** 1400 ft. **Coverage:** April 12, 17, 22, 29; May 3, 6, 10, 17; 0500-0800, PST. Total party-hours: 24. **Census:** Phainopepla, 2; Killdeer, 1; Mourning Dove, 1; Verdin, 1; Am. Kestrel, +. **Total:** 5 species; 5 territorial males (27/km<sup>2</sup>, 11/100 acres). **Remarks:** This plot is used heavily by off-road vehicles and for camping; both activities are unauthorized. Vegetation (both perennial and annual) is deteriorating, as areas are cleared for campsites and trails develop through vehicle use. — *MICHAEL WEINSTEIN, and K. H. BERRY, California Desert Plan Program, Bureau of Land Management, 1695 Spruce St., Riverside, Calif. 92507.*

#### 149. UNDISTURBED COASTAL SAGE SCRUB. —

**Location:** California; Los Angeles Co., Rancho Palos Verdes. Section of Klondike Canyon between Dauntless Dr. and Packsaddle Rd.; 33°44'25"N, 118°21'16"W, San Pedro Quadrangle, USGS. **Continuity:** New. **Size:** 4.41 ha = 10.9 acres (roughly square, 210 x 210 m, measured by tape). **Description of Plot:** Mostly a steep, densely foliated, W-facing canyon. The principal vegetation and its relative frequency was: White Sage (*Salvia apiana*) 42%, Coastal Sagebrush (*Artemisia californica*) 31%, Lemonadeberry (*Rhus integrifolia*) 16%, Black Sage (*S. mellifera*) 9%, apricot-pear Cactus (*Opuntia littoralis*) 2%. The cactus was found mostly on the E-facing portion of the canyon. The bottom of the canyon also contained Coyote Brush (*Baccharis pilularis*) and *Baccharis* (*californica*). Various other annuals, grasses and shrubs also constituted a small percentage of the flora

**Elevation:** 380-560 ft. **Edge:** Bordered on the N and E by similar vegetation. The E border was delineated by a chain link fence. To the W, the sage scrub gave way to cactus and fields of grass and Mustard (*Brassica nigra*). The immediate S border was a burned field. Farther south was a residential area. **Water:** A stream, down the center of the canyon, had water in it all during the study. **Weather:** Mostly clear with two rain storms during this period. Temperatures ranged from 67° to 46°F (thanks to the U.S. Coast Guard Station, Pt. Vicente for weather data). **Coverage:** April 5, 8, 19, 28; May 19-20, 22-23; 0600-0935. Total man-hours: 26. **Census:** California Quail, 4 (91, 37); Rufous-sided Towhee, 4; Brown Towhee, 4; Anna's Hummingbird, 3 (68, 28); Allen's Hummingbird, 3; Western Flycatcher, 2; Com. Bushtit, 2; Black-tailed Gnatcatcher, 2; Orange-crowned Warbler, 2; Lesser Goldfinch, 2; Song Sparrow, 2; Scrub Jay, 1; Cactus Wren, +. **Total:** 13 species; 31 territorial males (703/km<sup>2</sup>, 284/100 acres). **Visitors:** Red-tailed Hawk, Am Kestrel, Mourning Dove, Roadrunner, White-throated Swift, Mockingbird, N. Oriole, House Finch, Rufous-crowned Sparrow. **Remarks:** Owing to the steep terrain and dense foliage, much of the plot was inaccessible for locating nests. — RONALD H. MATSON, 20502 Wayne Ave., Torrance, Calif. 90503.

## BREEDING BIRDS OF PRAIRIE GRASS-LAND AND SHRUBLAND HABITATS IN NORTHEASTERN MONTANA

The five census plots described below are located on the Dreyer Brothers Ranch near the center of McCone County, Montana, approximately 21 miles (33.8 km) WNW of the town of Circle. These censuses were conducted as part of a baseline wildlife study in connection with a proposed lignite mine and conversion facility. The plots sample the predominant grassland and shrubland habitats of the dissected uplands characteristic of the area. Plots were located in representative habitats using aerial photographs, and were staked and placed using transit and/or hand compass. Canopy coverage of vegetation was estimated in 27.5 x 13.5 ft (8.4 x 4.1 m) quadrats using a modification of Daubenmire's coverage classes: T = less than 1% canopy cover, Class 1 = 1-5%, Class 2 = 5-25%, Class 3 = 25-50%, Class 4 = 50-75%, Class 5 = 75-95%. Latin names of plants used in plot descriptions follow Hitchcock and Cronquist's (1973) *Flora of the Pacific Northwest*.

Average annual precipitation at a National Climatic Center recording station at Circle is 13.5 in. Precipitation for the period April through July was 6.13 in., or 1.61 in. below normal, with a large percentage of the precipitation falling during a single major rainstorm on June 14-15. Most of the smaller stockponds which were dry throughout May and early June were filled to capacity by this rainstorm. However, groundwater was not replenished due to loss of precipitation as overland flow, and subsequent greenflush was of limited duration. Temperatures were higher than normal throughout the period. The entire area was heavily grazed by sheep and cattle, and grassland development was slight over the summer.

Special thanks are due to Susan S. Thompson and Fred Kruse for assistance with census runs, and to Richard A. Prodigers for vegetation analysis. This study

was funded by Dreyer Brothers, Inc. — LARRY S. THOMPSON and THOMAS D. DAHMER, Montana Department of Natural Resources and Conservation, 32 South Ewing, Helena, Mt. 59601.

**150. SILVER SAGEBRUSH FLAT.** — **Location:** Montana; McCone Co.; SE quarter of Sec. 31, T20N, R45E; 47°25'N, 106°1'W, AMS, Jordan (NL 13-1) **Continuity:** New. **Size:** 24 ha = 59.3 acres (rectangular, 300 x 800 m, paced). **Description of Plot:** Silver Sagebrush (*Artemisia cana*) flat following an ephemeral tributary of Nelson Creek, bordered on either side by grassland. The longer axis of the plot follows the tributary, and the sagebrush flat covers the central 100-200 m along this axis. Grassland accounts for approximately 60% of the plot, and is dominated by Needle-and-thread (*Stipa comata*), Blue Grama (*Bouteloua gracilis*), Thread-leaved Sedge (*Carex filifolia*), and W. Wheatgrass (*Agropyron smithii*). Several patches of Little Bluestem (*Andropogon scoparius*) are found near the SW corner of the plot. Salt-grass (*Distichlis stricta*) is dominant in the northwestern corner of the plot. Gentle banks up to 1.5 m in height separate the upland grassland from the sagebrush. Silver Sagebrush forms a dense shrub layer about 1.0 m in height, and patches of W. Snowberry (*Symporicarpos occidentalis*) and Arkansas Rose (*Rosa arkansana*) of similar height are interspersed throughout. Canopy coverage estimates for a quadrat in the Silver Sagebrush are: litter, 5; Silver Sagebrush, 5; W. Wheatgrass, 5, Prairie Sandgrass (*Calamovilfa longifolia*), 1; bare soil, T; Blue Flax (*Linum perenne*), T; Crested Wheatgrass (*Agropyron cristatum*), T; Green Needlegrass (*Stipa viridula*), T; Kentucky Bluegrass (*Poa pratensis*), T; Plains Muhly (*Muhlenbergia cuspidata*), T; Saltgrass, T, W. Snowberry, T; Yarrow (*Achillea millefolium*), T. Estimates for a quadrat located in Western Snowberry are: litter, 5; Western Snowberry, 4; Awned Wheatgrass (*Agropyron caninum*), 3; Showy Milkweed (*Asclepias speciosa*), 1; Bull Thistle (*Cirsium vulgare*), 1; Green Needlegrass, 1; Sandberg's Bluegrass (*Poa sandbergii*), 1; bare soil, T; Maximilian's Sunflower (*Helianthus maximilianii*), T; Silver Sagebrush, T. Three isolated clumps of Silver Buffaloberry (*Shepherdia argentea*) to 3 m in height occur near the downstream (NE) end of the plot, and one clump of Com. Chokecherry (*Prunus virginiana*) is found near the center of the plot. **Edge:** Similar grassland along the E and W borders; similar Silver Sagebrush flats to S; sagebrush gives way to Saltgrass flats immediately downstream of the plot. **Elevation:** 2470-2500 ft. **Coverage:** May 26; June 17-18, 27-28; July 6-7, 9; 8 trips, 0520-2100. Total man-hours: 18. **Census:** Lark Bunting, 16 (67, 27); Brewer's Sparrow, 9 (38, 15), Com Yellowthroat, 8 (33, 13); W. Meadowlark, 7 (29, 12), Grasshopper Sparrow, 5 (21, 8); E. Kingbird, 3 (13, 5), Sprague's Pipit, 3; Mourning Dove, 2; Horned Lark, 1, Brown Thrasher, 1; Loggerhead Shrike, 1; Brown-headed Cowbird, 1; Vesper Sparrow, 1; Chestnut-collared Longspur, 1; Mallard, +; Marsh Hawk, +, Prairie Falcon, +. **Total:** 17 species; 59 territorial males or females (246/km<sup>2</sup>, 99/100 acres). **Visitors:** Gadwall, Am. Kestrel, Sharp-tailed Grouse, Ring-necked Pheasant, Short-eared Owl, Com. Nighthawk, Com. Flicker, W. Kingbird, Say's Phoebe, Bank Swallow, Barn Swallow, Cliff Swallow, Red-winged Blackbird, N. Oriole, Brewer's Blackbird, Savannah Sparrow, Lark Sparrow, Chipping Sparrow, Chestnut-collared Longspur. **Remarks:** Nine nests were found within the plot.

Kingbird, 2 (1 with 2 eggs later destroyed by weather, 1 with 4 young); Brewer's Sparrow, 2 (1 with 3 eggs and 1 with 4); Mallard, 1 (empty); Marsh Hawk, 1 (6 young); Brown Thrasher, 1 (contents not examined); Loggerhead Shrike, 1 (6 young); Chestnut-collared Longspur, 1 (4 eggs). A pair of Prairie Falcons nested several miles from this and the other plots; much of the area was used by the pair for hunting. Other vertebrates encountered on the plot during census runs: Prairie Rattlesnake (*Crotalus viridis*), White-tailed Jackrabbit (*Lepus townsendi*), Mule Deer (*Odocoileus hemionus*), White-tailed Deer (*O. virginianus*), Pronghorn (*Antilocapra americana*).

**151. SILVER BUFFALO BERRY - RED OSIER DOGWOOD COULEE.** — **Location:** Montana; McCone Co.; overlaps boundary of Sec. 3 and 10, T20N, R45E, 47°31'N, 105°58'W; AMS, Glendive (NL 13-2). **Continuity:** New. **Size:** 25 ha = 61.8 acres (square, paced). **Description of Plot:** Drainage head in rolling grassland, E aspect, dissected by dendritic coulee. Grassland covers about 60% of plot and is dominated by low mats of Blue Grama, Needle-and-thread, and Thread-leaved Sedge of relatively short stature (2-15 cm) with scattered island-like clumps of Little Bluestem and Bluebunch Wheatgrass (*Agropyron spicatum*) up to 30 cm in height. Canopy coverage estimates for a quadrat located in typical grassland within the plot are: Blue Grama, 3; Needle-and-thread, 3; litter, 2; Thread-leaved Sedge, 2; bare soil, 1; Salt sage (*Atriplex nuttallii*), 1; Winterfat (*Eurotia lanata*), 1; bare rock, T; Broom Snakeweed (*Gutierrezia sarothrae*), T; Fringed Sagewort (*Artemisia frigida*), T; Indian-wheat (*Plantago patagonica*), T; lichens, T; mosses, T; Scarlet Globemallow (*Sphaeralcea coccinea*), T; Silver Sagebrush, T. Coulee has 5 major arms within plot. Local relief is great; main trunk cuts as deeply as 6 m below plane of grassland. Coulee walls are very steep, some nearly vertical. Long, narrow peninsulas of grassland extend between coulee arms. North-facing coulee walls and coulee heads support dense shrubbery up to 3 m in height, dominated by Silver Buffaloberry, Chokecherry, Serviceberry (*Amelanchier alnifolia*), and Red-osier Dogwood (*Cornus stolonifera*). Canopy coverage estimates for a quadrat located in one of the coulee heads are: litter, 5; Silver Sagebrush, 5; Red-osier Dogwood, 3; Serviceberry, 2; W. Snowberry, 2; Com Chokecherry, 1; Green Needlegrass, 1; mosses, 1; Poison Ivy (*Rhus radicans*), 1; rose (*Rosa sp.*), 1; Silver Buffaloberry, 1; Skunkbush Sumac (*Rhus trilobata*), 1; bare soil, T; Fringed Sagewort, T; lichens, T; Mountain Gooseberry (*Ribes montigenum*), T; Stiff Goldenrod (*Solidago rigida*), T; Yarrow, T; Yellow Salsify (*Tragopogon dubius*), T. Other coulee walls consist of steep clay banks nearly devoid of vegetation. The bottom of the coulee trunk is relatively flat and supports a low shrub layer (less than 1 m in height) dominated by rose, Silver Sagebrush, Skunkbush Sumac, and W. Snowberry, as well as a few isolated Great Plains Cottonwood trees (*Populus deltoides*) up to 5 m in height. Other coulee shrubs include Com. Juniper (*Juniperus communis*), Horizontal Juniper (*J. horizontalis*), Rocky Mountain Juniper (*J. scopulorum*), and Rubber Rabbitbrush (*Chrysothamnus nauseosus*). **Edge:** Similar grassland continues upslope from coulee; coulee trunk widens downstream and supports somewhat less tall shrubbery. **Elevation:** 2620-2760 ft. **Coverage:** May 25-26; June 19, 21, 28, July 4-5, 9; 8 trips, 0520-2115. Total man-hours: 19 2 **Census:** Rufous-sided Towhee, 10 (40, 16), W

Meadowlark, 8 (32, 13), Brown Thrasher, 5 (20, 8), Yellow Warbler, 5; Mourning Dove, 3 (12, 5); E. Kingbird, 3; Horned Lark, 3; Rock Wren, 3; Say's Phoebe, 2, Brown-headed Cowbird, 2; Lark Sparrow, 2; Loggerhead Shrike, 1; Yellow-breasted Chat, 1; Marsh Hawk, +, Sprague's Pipit, +; Brewer's Blackbird, +. **Total:** 16 species, 48 territorial males or females (192/km<sup>2</sup>, 78/100 acres). **Visitors:** Mallard, Ring-necked Pheasant, Gray Partridge, Great Horned Owl, Com. Nighthawk, Rough-winged Swallow, Black-billed Magpie, Mountain Bluebird, Am. Goldfinch, Lark Bunting. **Remarks:** Four nests were located on the plot: E. Kingbird, 1 (4 eggs), Say's Phoebe, 1 (5 young); W. Meadowlark, 1 (4 eggs, including 3 cowbird eggs); Lark Sparrow, 1 (4 eggs). A Marsh Hawk nest located in the bottom of the main coulee trunk just 5 m outside the plot contained 6 eggs on May 25, but was destroyed by a flash flood following the June 14 rainstorm. Other vertebrates observed on the plot during census runs: Great Plains Toad (*Bufo cognatus*), Prairie Rattlesnake, Cottontail (*Sylvilagus sp.*), White-tailed Jackrabbit, Porcupine (*Erethizon dorsatum*), Least Chipmunk (*Eutamias minimus*), Mule Deer

**152. SILVER BUFFALO BERRY-SILVER SAGE-BRUSH COULEE.** — **Location:** Montana; McCone Co., overlaps border of Sec. 19 and 20, T20N, R45E; 47°28'N, 106°1'W, AMS, Jordan (NL 13-1). **Continuity:** New **Size:** 25 ha = 61.8 acres (square, paced). **Description of Plot:** Most of plot (75%) is rolling grassland, E aspect, dominated by Blue Grama and Needle-and-thread, and containing patches of Little Bluestem. A broad, shallow coulee cuts across the NE corner of the plot, and an E-W ridge separates two narrower coulees whose heads lie within the plot. Coulee walls are relatively shallow, and local relief does not exceed 3 m. Bottoms are dominated by W. Wheatgrass, mats of Horizontal Juniper, and patches of Silver Sagebrush, Skunkbush Sumac, W. Snowberry, and Rose. Clumps of Silver Buffaloberry to 3 m in height are scattered along the coulee walls and bottoms. Other shrubs of the coulees are closely associated with Silver Buffaloberry, and include Com. Chokecherry, Serviceberry, and Rocky Mountain Juniper. A 0.5-ha portion of an abandoned field now dominated by Cheat Grass (*Bromus tectorum*) and Russian Thistle (*Salsola kali*) extends into the NW corner of the plot, and a barbed wire fence and dirt road run parallel to and 100 m east of the W boundary. Other major shrubs found in the plot include Broom Snakeweed, Fringed Sagewort, and Yucca (*Yucca glauca*). **Edge:** Similar grassland surrounds the plot except where the coulees (to the E and NW) and abandoned cropland continue. **Elevation:** 2550-2680 ft. **Coverage:** May 26, June 18, 22, 30; July 1, 6, 19; August 17; 8 trips, 0600-2045. Total man-hours 17.8. **Census:** Mourning Dove, 9 (36, 15); W. Meadowlark, 8 (32, 13); Horned Lark, 4 (16, 6); Brown Thrasher, 4; E. Kingbird, 3 (12, 5); Loggerhead Shrike, 2; Lark Bunting, 2; Ring-necked Pheasant, 1; Brown-headed Cowbird, 1; Red-tailed Hawk, +; Prairie Falcon, +; Vesper Sparrow, +. **Total:** 12 species, 34 territorial males or females (136/km<sup>2</sup>, 55/100 acres). **Visitors:** Am Kestrel, Sharp-tailed Grouse, Killdeer, Com. Nighthawk, Com. Flicker, Bank Swallow, Rough-winged Swallow, Cliff Swallow, Black-billed Magpie, Rock Wren, Sprague's Pipit, Yellow Warbler, Brewer's Blackbird, Rufous-sided Towhee, Lark Sparrow, Chestnut-collared Longspur. **Remarks:** 17 nests were located on the plot

Mourning Dove, 8 (all with 2 eggs or young), E. Kingbird, 3 (1 with 4 eggs, 2 empty); Brown Thrasher, 2 (nests vacant, young nearby); Loggerhead Shrike, 2 (nests vacant, young nearby); W. Meadowlark, 2 (one with 4, 1 with 3 eggs). A pair of Red-tailed Hawks nested 0.5 miles from the study plot. Mammals observed on the plot during census runs: White-tailed Jackrabbit, Cottontail, Least Chipmunk, Porcupine, Pronghorn, Red Fox (*Vulpes fulva*), Mule Deer.

### 153. NEEDLE-AND-THREAD - BLUE GRAMA GRASSLAND.

**Location:** Montana; McCone Co.; borders center of E boundary of Sec. 25, T20N, R44E; 47°27'N, 106°2'W; AMS, Jordan (NL 13-1). **Continuity:** New. **Size:** 25 ha = 61.8 acres (square, surveyed). **Description of Plot:** Rolling grassland, S aspect, dominated by Blue Grama, Needle-and-thread, and Thread-leaved Sedge with patches of bare earth and Little Bluestem scattered throughout. Grazing pressure was heavy during the summer. Canopy cover estimates for a quadrat located within the plot are: Needle-and-thread, 5; litter, 3; Blue Grama, 2; Thread-leaved Sedge, 2; bare soil, 1; W. Wheatgrass, T; Rush-like Skeletonweed (*Lygodesmia juncea*), T; Plains Pricklypear (*Opuntia polyacantha*), T; Scarlet Globemallow, T. A wide N-S coulee (relief up to 3 m on downstream end) transects the plot near its W boundary. The bottom of this coulee is dominated by Needle-and-thread, Green Needlegrass, Blue Grama, W. Wheatgrass, and Little Bluestem; banks are largely bare earth. A few clumps of Horizontal Juniper and a single low (less than 1.5 m in height) Silver Buffaloberry clump are found in this coulee. A barbed wire fence forms the eastern boundary of the plot. **Edge:** Similar grassland on all sides. Rocky scoria outcrops are found 100 m to S of plot, and the Saltgrass floodplain of Nelson Creek begins 200 m to S of plot. **Elevation:** 2460-2560 ft. **Coverage:** April 28; May 23; June 18-19, 27, 29; July 8, August 14; 8 trips, 0500-2120. Total man-hours: 15

**Census:** Horned Lark, 11 (44, 18); W. Meadowlark, 5 (20, 8); Chestnut-collared Longspur, 5; Vesper Sparrow, 2; Grasshopper Sparrow, 1; Golden Eagle, +; Prairie Falcon, +. **Total:** 7 species, 24 territorial males or females (96/km<sup>2</sup>, 39/100 acres). **Visitors:** Marsh Hawk, Am Kestrel, Killdeer, Upland Sandpiper, Com. Night-hawk, W. Kingbird, Rough-winged Swallow, Barn Swallow, Cliff Swallow, Sprague's Pipit, Loggerhead Shrike, Brewer's Blackbird, Lark Bunting, Lark Sparrow. **Remarks:** The Grasshopper and Vesper Sparrow territories were associated with the coulee. One Horned Lark nest was found within the plot. A pair of Golden Eagles nested 1.9 km from the plot, which was included in their territory. Mammals seen on plot during census runs White-tailed Jackrabbit, Striped Skunk (*Mephitis mephitis*).

### 154. WESTERN WHEATGRASS - BLUE GRAMA PASTURE.

**Location:** Montana; McCone Co., Sec. 23, T20N, R44E; 47°28'N, 106°3'W; AMS, Jordan (NL 13-1). **Continuity:** New. **Size:** 25 ha = 61.8 acres (square, paced). **Description of Plot:** Flat to rolling grassland, S aspect, dominated by W. Wheatgrass, Blue Grama, and Needle-and-thread. Very heavily grazed by sheep and grasshoppers; by the end of the season nearly all grasses were cropped nearly to ground level. Clumps of Plains Pricklypear are scattered throughout the grid. Canopy coverage estimates for two quadrats located within the plot follow. Quadrat A: bare soil, 3; Blue Grama, 3; W. Wheatgrass, 3, litter, 1, Thread-leaved Sedge, 1, Cush-

ion Cactus (*Coryphantha vivipara*), T, lichens, T, Needle-and-thread, T; Scarlet Globemallow, T; Plains Pricklypear, T. Quadrat B: Blue Grama, 4; W. Wheatgrass, 3; litter, 2; bare soil, 1; Needle-and-thread, 1, Thread-leaved Sedge, 1; Cushion Cactus, T; Fringed Sagewort, T; Indian-wheat, T; lichens, T; Plains Pricklypear, T; Prairie Pepperweed (*Lepidium densiflorum*), T, White Milkwort (*Polygala alba*), T. The N end of the plot rises to rolling hills with scattered Big Sagebrush (*Artemisia tridentata*). Some standing water was present in the S portion during June censuses. A barbed wire fence forms the E boundary, and another runs just beyond the S boundary. Two old corrals are found at the SE and SW corners of the plot and are surrounded by wood debris and weedy annuals. An old wooden out-house stands near the SW corner. A fenced vegetation enclosure lies in the SE portion of the plot. **Edge:** Similar grassland to S and E, although less heavily grazed. The plot is bordered to the W by a steep bank below which runs Nelson Creek, supporting a dense growth of Am Bulrush (*Scirpus americanus*) and Foxtail Barley (*Hordeum jubatum*). **Elevation:** 2430-2480 ft. **Coverage:** May 24; June 17, 25, 26; July 3, 4, 10, 31; 8 runs, 0500-2100 Total man-hours: 16. **Census:** Horned Lark, 8 (32, 13); W. Meadowlark, 3 (12, 5); Chestnut-collared Longspur, 1; Prairie Falcon, +; Killdeer, +; Brewer's Blackbird, +, Lark Sparrow, +. **Total:** 7 species, 12 territorial males or females (48/km<sup>2</sup>, 19/100 acres). **Visitors:** Mallard, Gadwall, Am. Kestrel, Long-billed Curlew, Mourning Dove, Com. Nighthawk, E. Kingbird, W. Kingbird, Rough-winged Swallow, Barn Swallow, Cliff Swallow, Loggerhead Shrike, Yellow-headed Blackbird, Red-winged Blackbird, Brown-headed Cowbird, Lark Bunting, Vesper Sparrow. **Remarks:** W. Meadowlark territories appeared to be abandoned early, probably due to inadequate grass cover.

### 155. SHRUBBY SWAMP AND SEDGE HUM-MOCKS.

**Location:** Connecticut; Litchfield Co., N end of Bantam Lake, White Memorial Foundation, Litchfield, 41°43'02"N, 73°12'27"W. Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 11 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 19:625-627 (1965). **Coverage:** June 8-11, 13; 16-18; 0500-2100. Total man-hours: 20. **Census:** Swamp Sparrow, 42 (519, 210); Red-winged Blackbird, 36 (445, 180); Yellow Warbler, 30 (371, 150); Com Yellowthroat, 16 (198, 80); Willow Flycatcher, 10 (124, 50); Virginia Rail, 9 (111, 45); Gray Catbird, 8 (99, 40); Song Sparrow, 8; Mallard, 6 (74, 30); Cedar Waxwing, 6, Am. Goldfinch, 6; Long-billed Marsh Wren, 4 (49, 20); Alder Flycatcher, 3 (37, 15); Wood Duck, 2; E. Kingbird, 2; Am. Bittern, 1; Am. Coot, 1; Black-billed Cuckoo, 1, Tree Swallow, 1; Great Crested Flycatcher, 1; Veery, 1, N. Oriole, 0.5. **Total:** 22 species; 194.5 territorial males (2,403/km<sup>2</sup>, 973/100 acres). **Remarks:** A rise of slightly less than 10% is reflected in the three main species Swamp Sparrow, from 32 to 42; Red-winged Blackbird, 32 to 36; and Yellow Warbler, 24 to 30. This gain may be partly artificial; high-density species have been recorded more with increased observation. Fairly high water, generally standing from 1.5-3 ft throughout, may have caused the rails to drop from 14 to 9. A new breeder was Am. Bittern. Special thanks to Jim Cavanaugh for his help. — ANDREW MAGEE, 34 Hobson St., Springfield, Mass 01109

**156. NINE SMALL PONDS.** — **Location:** Ohio, Wyandot Co., Crawford Township, most of them near the intersection of State Route 23 (15), County Highway 96, and State Route 103, about 0.5 mi SW of Carey; approximately 40°56'N, 83°24'W, Upper Sandusky Quadrangle, USGS. **Continuity:** New. **Size:** Total water acreage plus narrow margins, 20.23 ha = 50 acres (County engineer maps used). All ponds were undergoing a loss of water throughout the nesting season and at the close were at least 5 ft below their normal levels with a much reduced total water acreage. **Description of pond areas:** Pond #1: Quadrilateral, grass-bordered on the N, E, and S margins; old-field on the W border; intermittent cattail on W, S, and E edges when at normal pond level, but much reduced in 1977. Approximately 8 acres. Pond #2: Triangular; manicured, grassy borders; steep-sided, non-vegetated; corn crop on the S, highway N, and railroad on the W. Approximately 3.5 acres. Pond #3: Quadrilateral; grass-bordered, on all sides; deciduous row on E; highway interchange adjacent on the S and W sides, filling-station on N. Approximately 7 acres. Pond #4: Triangular; grass-bordered; highway interchange on the N and W sides; residence, SW; cropland on the S. Approximately 4 acres. Pond #5: Older than the other highway ponds; quadrilateral; grass-bordered on S by overpass slope; vegetated by small trees on N; woodland on the E; cattail in the W corner; small islands in the middle, when the water level is low. Approximately 9.9 acres. Pond #6: Triangular; steep-sided; highway overpass slope on the S, grass-covered; woodland on the E leg, corn on the N leg adjacent to a grass border. Approximately 2.5 acres. Pond #7: Narrowly rectangular; old-field margins; overpass slope on the N; otherwise surrounded by crop land; fencerow with sapling growth on the W border. Approximately 5.8 acres. Pond #8: Formed as a result of excavating for clay; now in Carey residential section; mature willow trees on N border and small woodland on the NE corner; pond in two sections connected by a narrow channel; S section with low-diameter trees, shore partially riprapped with stone. South section confined by streets on W and S sides, while residential lawns complete the edge. Approximately 4.3 acres. Pond #9: Formed by excavation of peaty humus, usually filled with water, and drained by a field ditch on the E side. A small cattail marsh is present at the W end. A vegetated zone a few feet wide is on the N side adjacent to a grass-bordered road. Corn surrounds the other 3 sides. The spongy bottom, with the exception of narrow channels on the N and S edges, became covered with a mixed vegetation of cattails, sedges, and flowering herbs as the water level decreased in early spring and summer. Conspicuous herbs in addition to cattail (*Typha latifolia* and *T. angustifolia*), are Boneset (*Eupatorium perfoliatum*), Swamp Milkweed (*Asclepias incarnata*), Blue Verbain (*Verbena hastata*), Goldenrod (*Solidago graminifolia*), Giant Ragweed (*Ambrosia trifida*), Mullein (*Verbascum thapsus*). On all but the W border, fill debris, ditch bank, and excavated margin support a rich variety of pioneer weedy growth with thistle, Burdock, Catnip, and Jimson Weed, being among some of the more evident herbs. In the NW corner a small sapling community is present, including Salix, Cottonwood (*Populus deltoides*), Elderberry (*Sambucus canadensis*), and Ash. **Weather:** Record cold January; early spring with May frost, continued lack of rainfall. **Coverage:** Almost daily for short periods of time; weekly for longer periods from

April through August. Total hours, all ponds, 48. **Census:** The numbers detailed in the census in the order in which they occur represent: (1) the number of pairs found at all ponds; (2) pairs/100 ha; (3) pairs/100a, (4) the pond numbers where each species was found. Song Sparrow, 18 (89, 36) (all ponds); Red-winged Blackbird, 10 (49, 20) (1, 5, 7, 9); Spotted Sandpiper, 6 (30, 12) (1, 2, 3, 5, 7, 9); Indigo Bunting, 6 (1, 5, 9); Killdeer, 5 (25, 10) (1, 5, 9); Am. Goldfinch, 5 (1, 5, 9); Gray Catbird, 3 (15, 6) (5, 7, 9); Mourning Dove, 2 (1, 9); Am. Robin, 2 (Pond 8, residential); Yellow Warbler, 2 (Ponds 5, 9); Com Yellowthroat, 2 (Ponds 1, 9); Com. Grackle, 2 (Pond 8, residential); Cardinal, 2 (Ponds 1, 5); Savannah Sparrow, 2 (Ponds 1, 9); Pied-billed Grebe, 1 (4, 2) (5, deserted from Pond 1); Canada Goose, 1 (Pond 9, adults and 5 young); Wood Duck, 1 (Pond 5, adults and 5 young); Bobwhite, 1 (Pond 9); Am. Coot, 1 (Pond 8); Willow Flycatcher, 1 (Pond 9); House Wren, 1 (Pond 8, residential), Warbling Vireo, 1 (Pond 8, residential); Chipping Sparrow, 1 (Pond 8, residential). **Total:** 23 species; 80 territorial males (395/km<sup>2</sup>, 160/100 acres). **Remarks:** The highway ponds represent a varied age span of approximately 20 years. Species recorded as breeding were those confined to the pond areas and their immediate borders (approximately 25 ft), including where woodland edge was close, and around Pond #8 within residential Carey. Such edge is very attractive and where present would enhance the values of the ponds. The most productive ponds were (1) vegetated, either on the margins or within the water area by cattail, sedges, or rushes, (2) relatively shallow with gentle, sloping banks, (3) aged sufficiently to supply the required vegetation. The lack of rainfall produced a two-way effect on populations. Am Kestrel, Screech Owl, Great Horned Owl, and Cooper's Hawk were using the ponds directly as residents or as part of their home ranges. — A. H. CLAUGUS, 228 S Lake St., Carey, Ohio 43316.

## BREEDING BIRD POPULATIONS OF SELECTED SEMIPERMANENT WET- LANDS IN SOUTH-CENTRAL NORTH DAKOTA — 1977

The following four censuses are on selected wetlands near Medina in south-central North Dakota. The area is within the Coteau du Missouri, a glacially formed terminal moraine extending diagonally across central North Dakota from SE to NW. Precipitation records are kept at Medina, but the nearest temperature station is at Gackle, North Dakota, 20 miles SE of the center of the study area. Total rainfall for the month of June was 2.86 inches, 0.04 inches below normal. Temperature during June was slightly above normal with an average high of 81°F and an average low of 54°F. All censuses were conducted when winds were calm to light. Precipitation for the 12-month period preceding the census was 10.28 in., 6.65 in. below normal, causing wetlands on the study area to be in various stages of drawdown by June 1. Waterfowl species and numbers are listed separately under Remarks because the wetlands represent an unknown fraction of the territory of each pair, and because most waterfowl on the areas failed to breed because of drought conditions. — GARY L. KRAPU, U.S. Fish and Wildlife Service, Northern Prairie Wildlife

*Research Center, Jamestown, N.D. 58401 and ROBERT K GREEN, Dept. of Entomology, Fisheries and Wildlife, Univ. of Minnesota, St. Paul, Minn. 55108.*

**157. CATTAIL-BULRUSH WETLAND I.** — **Location:** North Dakota; Stutsman Co., 6 mi S and 1.5 mi E of Medina; 46°49'45"N, 99°16'20"W, Medina SE Quadrangle, USGS. **Continuity:** New. **Size:** 6.4 ha = 15.8 acres (irregular, measured by planimeter from aerial photo). **Description of Plot:** A freshwater semipermanent (Class IV) wetland. The dominant marsh plants are Broad-leaved Cattail (*Typha latifolia*) and Hardstem Bulrush (*Scirpus acutus*). Plants in the wet meadow zone include Foxtail (*Hordeum jubatum*), Silverweed Cinquefoil (*Potentilla anserina*), Hedge Nettle (*Stachys palustris*), and Baltic Rush (*Juncus balticus*). Most of the wetland (90%) is covered by emergent vegetation, of which bulrush comprises 60%, with a few openings in the south-central portion. **Edge:** Bordered on the NE, E, S, and SW by grazed pasture; cattle were not present during the census period. The wetland is bordered by cropland on the NW planted to Wheat (*Triticum aestivum*). **Elevation:** 1806 ft. **Coverage:** June 4, 6-8, 15, 24; 0530-1100, CDT. Total man-hours: 6. **Census:** Red-winged Blackbird, 27 (422, 171); Yellow-headed Blackbird, 22 (344, 139) Com. Yellowthroat, 5 (78, 32); Long-billed Marsh Wren, 3 (47, 19); Sharp-tailed Sparrow, 3; Sora, 1; Killdeer, 1; Com. Snipe, 1; Brown-headed Cowbird, 1. **Total:** 9 species; 64 territorial and non-territorial males (1001/km<sup>2</sup>, 405/100 acres). **Visitors:** Willet, Ring-billed Gull, Mourning Dove, Horned Lark, Barn Swallow, W. Meadowlark, Com. Grackle. **Remarks:** Mean numbers of waterfowl pairs sighted on the wetland: Gadwall, 0.7; Mallard, 0.4; Blue-winged Teal, 0.2; Pintail, 0.2; N. Shoveler, 0.2. Nests found: Red-winged Blackbird, 22; Yellow-headed Blackbird, 8. Behavior of the Com. Snipe suggested it nested in the marsh vegetation, but no nests were found. The wetland was approaching complete drawdown during the censuses; only a few small pools of water existed in the basin; maximum water depth was 7.9 in at the beginning of the census period.

**158. CATTAIL-BULRUSH WETLAND II.** — **Location:** North Dakota; Stutsman Co., 3 mi S of Medina; 46°50'25"N, 99°18'45"W, Medina SE Quadrangle, USGS. **Continuity:** New. **Size:** 7.28 ha = 18.0 acres (irregular, measured by planimeter from aerial photo). **Description of Plot:** A freshwater semipermanent (Class IV) wetland. The dominant emergent marsh plants are Hybrid Cattail (*Typha "glauca"*), Broad-leaved Cattail (*T. latifolia*), and Hardstem Bulrush (*Scirpus acutus*). Small stands of Reed (*Phragmites communis*) also occur in the wetland. The principal submergents were Com. Bladderwort (*Utricularia vulgaris*) and Com. Watermilfoil (*Myriophyllum exaltatum*). The principal wet meadow plants are Silverweed Cinquefoil (*Potentilla anserina*), Foxtail (*Hordeum jubatum*), and Hedge Nettle (*Stachys palustris*). Several Peach-leaved Willow (*Salix amygdaloides*) trees also occur in the wet meadow zone. Extensive stands of cattail occur in the W half of the wetland. Cattail comprises approximately 65% of the emergent cover; emergent cover is restricted to approximately 35% of the wetland. Maximum water depth at the onset of the census was 27.3 in. A spring is at the SE boundary of the wetland. **Edge:** Bordered on the N, E, and S by grazed native pasture; cattle were present dur-

ing the censuses. On the W is a paved road. The wetland is bordered by concentric rings of Cottonwood (*Populus deltoides*) marking the location of past highwater levels. **Elevation:** 1741 ft. **Coverage:** June 4, 6-7, 15-16, 24, 0600-1100, CDT. Total man-hours: 7. **Census:** Yellow-headed Blackbird, 153 (2100, 850); Am. Coot, 23 (316, 128); Long-billed Marsh Wren, 21 (288, 117); Red-winged Blackbird, 19 (261, 106); Com. Yellowthroat, 14 (192, 78); Pied-billed Grebe, 7 (96, 39); Song Sparrow, 5 (69, 28); Eared Grebe, 3 (41, 17); Virginia Rail, 2; Killdeer, 1; Mourning Dove, 1. **Total:** 11 species; 249 territorial and non-territorial males (3418/km<sup>2</sup>, 1383/100 acres). **Visitors:** Black-crowned Night Heron, Yellow-crowned Night Heron, Am. Bittern, Willet, Ring-billed Gull, Black Tern, E. Kingbird, W. Kingbird, Tree Swallow, Barn Swallow, Gray Catbird, Loggerhead Shrike. **Remarks:** Mean numbers of waterfowl pairs sighted on the wetland: Ruddy Duck, 13.3; Redhead, 10.8; Blue-winged Teal, 6.5; Mallard, 4.2; Gadwall, 3; Canvasback, 2.7; N. Shoveler, 2.7; Pintail, 0.3; Green-winged Teal, 0.2. Nests found: Yellow-headed Blackbird, 344, Am Coot, 31; Long-billed Marsh Wren, 18; Pied-billed Grebe, 12; Red-winged Blackbird, 6; Ruddy Duck, 4, Virginia Rail, 4; Canvasback, 2; Mallard, 1; Mourning Dove, 1. At least one of the Virginia Rail nests was likely a renest attempt based on small clutch size and date of nest initiation. Yellow-headed Blackbird nests were located principally in stands of cattail isolated from shore by open water.

**159. CATTAIL-BULRUSH WETLAND III.** — **Location:** North Dakota; Stutsman Co., 3 mi S and 2 mi W of Medina; 46°49'40"N, 99°20'20"W, Medina SE Quadrangle, USGS. **Continuity:** New. **Size:** 4.98 ha = 12.3 acres (irregular, measured by planimeter from aerial photo). **Description of Plot:** A freshwater semipermanent (Class IV) wetland. The dominant marsh plants are Hybrid Cattail (*Typha "glauca"*), Broad-leaved Cattail (*T. latifolia*), Hardstem Bulrush (*Scirpus acutus*), River Bulrush (*S. fluviatilis*), Com. Threesquare (*S. americanus*), and Sprangle-top (*Scolochloa festucacea*). Dominant plants of the wet meadow zone are Awned Sedge (*Carex atherodes*), Prairie Cordgrass (*Spartina pectinata*), Foxtail (*Hordeum jubatum*), and Silverweed Cinquefoil (*Potentilla anserina*). A few dense stands of Reed (*Phragmites communis*) also occur on the wetland. Hardstem bulrush comprises approximately 60% of the emergent cover; open water covers approximately 55% of the wetland. A barbed-wire fence crosses the wetland from E to W dividing it into approximately equal halves; the N half was within a pasture. Foxtail was abundant only in the wet meadow zone of the grazed N portion, and Sprangle-top was scarce in grazed marsh habitat but abundant in the non-grazed S portion. **Edge:** Bordered on the N by grazed pasture; cattle were not present during the census. An Alfalfa (*Medicago sativa*) field is on the E edge of the wetland and an ungrazed field of Bromegrass (*Bromus inermis*) and Alfalfa is adjacent to the S border. A hardtop road, resurfaced during the census, borders the wetland on the W. A small stand of Peach-leaved Willow (*Salix amygdaloides*) occurs at the SW edge. **Elevation:** 1777 ft. **Coverage:** June 4, 6-8, 15, 24; 0600-0900, CDT. Total man-hours: 5. **Census:** Yellow-headed Blackbird, 57 (1145, 463); Long-billed Marsh Wren, 13 (261, 106); Red-winged Blackbird, 13, Com. Yellowthroat, 8 (161, 65); Am. Coot, 5 (100, 41),

Brown-headed Cowbird, 4 (80, 33), Sharp-tailed Sparrow, 2; Pied-billed Grebe, 1; Virginia Rail, 1; Sora, 1; Killdeer, 1; Le Conte's Sparrow, 1; Song Sparrow, 1. **Total:** 13 species; 108 territorial and non-territorial males ( $2170/\text{km}^2$ , 878/100 acres). **Visitors:** Black-crowned Night Heron, Am. Bittern, Willet, Ring-billed Gull, Mourning Dove, E. Kingbird, Barn Swallow, Com. Grackle. **Remarks:** Mean numbers of waterfowl pairs sighted on the wetland: Blue-winged Teal, 5.5; Mallard, 3.3, Gadwall, 2.2; N Shoveler, 0.8; Am. Wigeon, 0.5; Pintail, 0.4.

**160. BULRUSH WETLAND.** — **Location:** North Dakota; Stutsman Co., 4 mi S of Medina;  $46^\circ49'40''\text{N}$ ,  $99^\circ18'05''\text{W}$ , Medina SE Quadrangle, USGS. **Continuity:** New Size: 5.63 ha = 13.9 acres (irregular, measured by planimeter from aerial photo). **Description of Plot:** A freshwater semipermanent (Class IV) wetland. The dominant marsh plant is Hardstem Bulrush (*Scirpus acutus*). The principal plants in the wet meadow zone are Com. Spikerush (*Eleocharis palustris*), Silverweed Cinquefoil (*Potentilla anserina*) and Foxtail (*Hordeum jubatum*). Much of the water surface beneath the bulrush is covered with a dense mat of Lesser Duckweed (*Lemna minor*). Bulrush stands cover approximately 35%, with large central areas of open water covering approximately 55%. Maximum water depth at the onset of the census period was 17 in. Small scattered stands of Broad-leaved Cattail (*Typha latifolia*) occur only in the N half. **Edge:** Bordered on all sides by grazed pasture; cattle were present during the census period. Several Chokecherry (*Prunus virginiana*) bushes are growing from a rockpile located at the extreme S edge. A spring-fed dugout, less than 0.25 acre in area, is located approximately 100 ft from the extreme NE corner. **Elevation:** 1754 ft. **Coverage:** June 4, 6-8, 15, 24, 0600-1000, CDT. Total man-hours: 7. **Census:** Yellow-headed Blackbird, 46 (818, 331); Red-winged Blackbird, 12 (213, 86); Long-billed Marsh Wren, 9 (160, 65), Com. Yellowthroat, 7 (124, 50); Am. Coot, 6 (107, 43), Sharp-tailed Sparrow, 5 (89, 36); Brown-headed Cowbird, 2; Virginia Rail, 1; Killdeer, 1. **Total:** 9 species; 89 territorial and non-territorial males ( $1582/\text{km}^2$ , 640/100 acres). **Visitors:** Willet, Ring-billed Gull, Com. Grackle. **Remarks:** Mean numbers of waterfowl pairs sighted on the wetland: Mallard, 43; Blue-winged Teal, 17.2, Gadwall, 11.5; Pintail, 8; Redhead, 7; Am. Wigeon, 3.2; Green-winged Teal, 2.5; N. Shoveler, 1.3; Canvasback, 0.5. Nests found: Yellow-headed Blackbird, 102, Am. Coot, 6; Red-winged Blackbird, 5; Virginia Rail, 1.

**161. BULRUSH AND CATTAI MARSH IN CONIFER FOREST.** — **Location:** Montana; Lake Co., on W Side of Flathead Lake, 6 mi N of Polson, on Kings Point Rd.,  $47^\circ35'\text{N}$ ,  $114^\circ09'\text{W}$ ; Wild Horse Island Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 40.47 ha = 100 acres. **Description of Plot:** See AB 31 84-85 (1977). **Weather:** All trips on clear days with light breeze and moderate temperature. **Coverage:** May 12, 17, 26; June 10, 13, 18, 28, 30; July 3, 7, 12; dawn-1100 and 1730-1930. Total man-hours: 62. **Census:** Red-winged Blackbird, 18 (44, 18); Yellow-headed Blackbird, 17 (42, 17); Song Sparrow, 17; Com. Yellowthroat, 16 (40, 16); Tree Swallow, 12 (30, 12); Blue-winged Teal, 9 (22, 9); Redhead, 9; Yellow Warbler, 9; Am. Coot, 8 (20, 8); Pied-billed Grebe, 7 (17, 7); Black-capped Chickadee, 7; Am. Robin, 7; Canada Goose, 6

(15, 6), Mallard, 6, Mourning Dove, 6, Pine Siskin, 6, Chipping Sparrow, 6; Cinnamon Teal, 5 (12, 5); Hammond's Flycatcher, 5; Willow Flycatcher, 5; W. Wood Pewee, 5; Swainson's Thrush, 5; Ruby-crowned Kinglet, 5; Wood Duck, 4 (10, 4); Sora, 4; Com. Nighthawk, 4, Barn Swallow, 4; Violet-green Swallow, 4; Red-breasted Nuthatch, 4; Long-billed Marsh Wren, 4; Cedar Waxwing, 4; Osprey, 3 (7, 3); Rufous Hummingbird, 3; Mountain Chickadee, 3; MacGillivray's Warbler, 3; Am Redstart, 3; Dark-eyed Junco, 3; Great Blue Heron, 2, N Shoveler, 2; Ring-necked Duck, 2; Ruffed Grouse, 2; Killdeer, 2; Calliope Hummingbird, 2; Com. Flicker, 2; Dusky Flycatcher, 2; Olive-sided Flycatcher, 2; Pygmy Nuthatch, 2; Yellow-rumped Warbler, 2; Com. Goldeneye, 1; Prairie Falcon, 1; Black Tern, 1; Com. Raven, 1; Hermit Thrush, 1; Townsend's Solitaire, 1; Orange-crowned Warbler, 1; Brown-headed Cowbird, 1; Cooper's Hawk, 0.5; Wilson's Phalarope, 0.5; Great Horned Owl, 0.5; Pileated Woodpecker, 0.5; Spotted Sandpiper, +; Saw-whet Owl, +; W. Flycatcher, +; Tennessee Warbler, +; Brewer's Blackbird, +; White-crowned Sparrow, +. **Total:** 66 species; 278 territorial males or females ( $687/\text{km}^2$ , 278/100 acres). **Remarks:** 37 nests found Great Blue Heron, 1; Canada Goose, 2; Osprey, 3; Prairie Falcon, 1; Am. Coot, 1; Mourning Dove, 2; Com Flicker, 1; Willow Flycatcher, 1; W. Wood Pewee, 1; Tree Swallow, 7; Long-billed Marsh Wren, 1; Am Robin, 2; Swainson's Thrush, 1; Ruby-crowned Kinglet, 1; Cedar Waxwing, 2; Yellow Warbler, 1; Com. Yellowthroat, 1; MacGillivray's Warbler, 1; Yellow-headed Blackbird, 1. Additional fledglings seen: Pied-billed Grebe, 14; Canada Goose, 16; Mallard, 15; Blue-winged Teal, 1; Wood Duck, 15; Am. Coot, 2; Com. Flicker, 3; Dusky Flycatcher, 2; Willow Flycatcher, 3; Song Sparrow, 7. Tree Sparrows, which were present and territorial during the breeding seasons of 1975 and 1976, were not seen after April in 1977. I wish to acknowledge the continued support of landowners Mr. & Mrs. P. L. MacDonald and Mr. & Mrs. W. Pinkney. — MARCELLA M. BISHOP, Shoreline Route, Polson, Mont. 59860

**162. FLOODPLAIN POND.** — **Location:** Colorado, Weld Co., about 6 mi S and 5.1 mi E of Johnstown. Parts of Secs. 34 & 35, T4N, R67W,  $40^\circ15'\text{N}$ ,  $104^\circ52'\text{W}$ ; Milliken Quadrangle, USGS. **Continuity:** Established 1974, 4 consecutive years. **Size:** 8.5 ha = 21 acres (measured from aerial photo with planimeter). **Description of Plot:** See AB 28:1034-1035 (1974). **Weather:** Mostly clear, dry and warm throughout census period. **Coverage:** May 6, 13, 24, 31; June 7, 14, 22, 28; sunrise-0930. Total man-hours: 5.25. **Census:** Yellow-headed Blackbird, 22 (259, 105); Com. Yellowthroat, 4 (47, 19); Red-winged Blackbird, 1. **Total:** 3 species; 27 territorial males (318, 129). **Remarks:** All breeding birds experienced a decline in numbers. The dominant Yellow-headed Blackbirds declined by 31% and many minor species did not nest on the area as in past years (Am. Bittern, Can. Goose, Am Coot, Spotted Sandpiper, W. Meadowlark). The plot was established to evaluate the effects of the St. Vrain Nuclear Generating Station on the surrounding environment. The pond will act as an intermediate holding location for blow-down water from the cooling towers of the plant, which has been in operation for only short periods in the first half of 1977. — LADISLAV R. HANKA, Dept. of Zool. and Ent., Colorado State Univ., Fort Collins, Colo., 80523.

**163. CATTAIL MARSH.** — **Location:** California, Los Angeles Co., 2 mi W of Wilmington, just N of Anaheim St. between Vermont Ave. and State Freeway 11. **Continuity:** New. **Size:** 5.23 ha = 12.91 acres (250 yds square, measured with steel tape and compass). **Description of Plot:** Typical freshwater marsh with 2 main bodies of water surrounded on 3 sides by vegetation; the W side is protected by a 30 foot cliff. Major elements in the ground cover include Com. Cattail (*Typha latifolia*), and Field Mustard (*Brassica* sp.) which dominates the drier areas. Mule Fat (*Baccharis viminea*) is the most conspicuous shrub, becoming very dense in places and averaging 7 ft in height. The only trees over 3 in. dbh are 2 Yellow Willows (*Salix lasiandra*) in the SW corner. A quantitative survey of the vegetation, based on 5 tenth-acre circles gave the following results: Shrub stems/acre 550,000; ground cover 70%. **Edge:** Part of a larger marsh of about 300 acres. To the S across Anaheim St. is a large oil refinery. **Topography:** Essentially flat, elevation 20 ft. **Water:** A man-made lake to the N feeds the lower marsh area. **Weather:** Mostly cool and dry except for 2.5 in. of rain between May 7 and 9. The temperature range was 49-73°F (average 62°F). **Coverage:** April 7, 10, 12, 14, 19, 21, 26, 28; May 5, 10; 0800-1300, averaging 2.3 hours each. Total man-hours: 23. **Census:** Tricolored Blackbird, 98 (1876, 759); Red-winged Blackbird, 37 (708, 287); House Finch, 4 (77, 31); Lesser Goldfinch, 3 (57, 23); Com. Bushtit, 2; Brown Towhee, 2; Song Sparrow, 2; Green Heron, 1; Mourning Dove, 1; W. Kingbird, 1; Mockingbird, 1; Am. Coot, +. **Total:** 12 species; 152 territorial males or females (2909/km<sup>2</sup>, 1177/100 acres). **Remarks:** The Tricolored Blackbirds were present in 2 separate breeding colonies. The colony near the center had 62 active nests; the colony located at the S end had 36. The Com. Bushtits were observed as 2 separate groups, one with 8 members and the second with 12. — *LAWRENCE H. PORTZER, 2650 Brian Ave., Torrance, Calif.*

**164. DESERT MARSH.** — **Location:** California; San Bernardino Co., Afton Canyon; 15 mi N, 17 mi E of Newberry; SW<sup>1/4</sup> of Sec. 17, T11N, R6E, Cave Mtn. Quadrangle, USGS; 35°02'N, 116°22'W. **Continuity:** New. **Size:** 5.71 ha = 14.1 acres (paced). **Description of Plot:** Typical marshy area of the Mojave River bottomlands; there is very little of this habitat in the Mojave River and in the desert in general. Two marsh areas, oblong in shape and NW-SE in orientation of the long axis, are separated by a 6 to 10 ft bank. A road runs along the bank, separating the marshes for most of their length. The marshes are sparsely lined with various species of Tamarisk (*Tamarix aphylla*, *T. parvifolia*, *T. ramosissima*), most of which (total, 45 shrubs) are shrubby and are under 8 ft in height; 7 shrubs are about 10 ft and 9 are 12 to 15 ft. Other prominent shrubs are Quail Brush (*Atriplex lentiformis*), Honey and Screwbean Mesquites (*Prosopis glandulosa* var. *torreyana*, *P. pubescens*), and Willow (*Salix gooddingii*). The Quail Brush was represented primarily by large (6-8 ft) dry dead bushes. Other shrub species occur in trace amounts. Annuals and herbs on the banks include Sea-purslane (*Sesuvium verrucosum*), Chinese Pusley (*Heliotropium curassavicum oculatum*), Yerba Mansa (*Anemopsis californica*), and Russian Thistle (*Salsola paulsenii*). Only birds occurring within the marsh or 3 to 6 ft of its edge were counted. Camping occurs around and on the edges of the two marshes; litter can be seen in the water. Vehicle

trails criss-cross the shallow part of the S marsh. **Edge:** Surrounded on all sides by Tamarisk-Saltbush; beyond the Tamarisk-Saltbush to the NE lies a bluff; to the SE more Tamarisk and marsh; to the SW a dirt road and the Union Pacific Railroad; and to the NW the Tamarisk-Saltbush plot (Census No. 148). **Topography:** Flat, surrounded by banks to 6 ft high. **Elevation:** 1400 ft. **Water:** Approximately one quarter of the plot is open water, the remainder has water several inches deep covered by vegetation. **Coverage:** April 10, 15, 20, 27; May 1, 4, 8, 11, 0500-0800, PST. Total party-hours: 24. **Census:** Red-winged Blackbird, 8 (140, 57); Am. Coot, 6 (105, 43); Com. Yellowthroat, 2; Verdin, 1; Am. Bittern, 1. **Total:** 5 species; 18 territorial males, (315/100 km<sup>2</sup>, 128/100 acres). **Remarks:** Red-winged Blackbirds, averaged between 2 and 5 females per male. The above count of 8 Red-winged Blackbirds is the number of territorial males in the study plot. The number of actual breeding females is probably nearer 30. — *MICHAEL WEINSTEIN, and K. H. BERRY, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.*

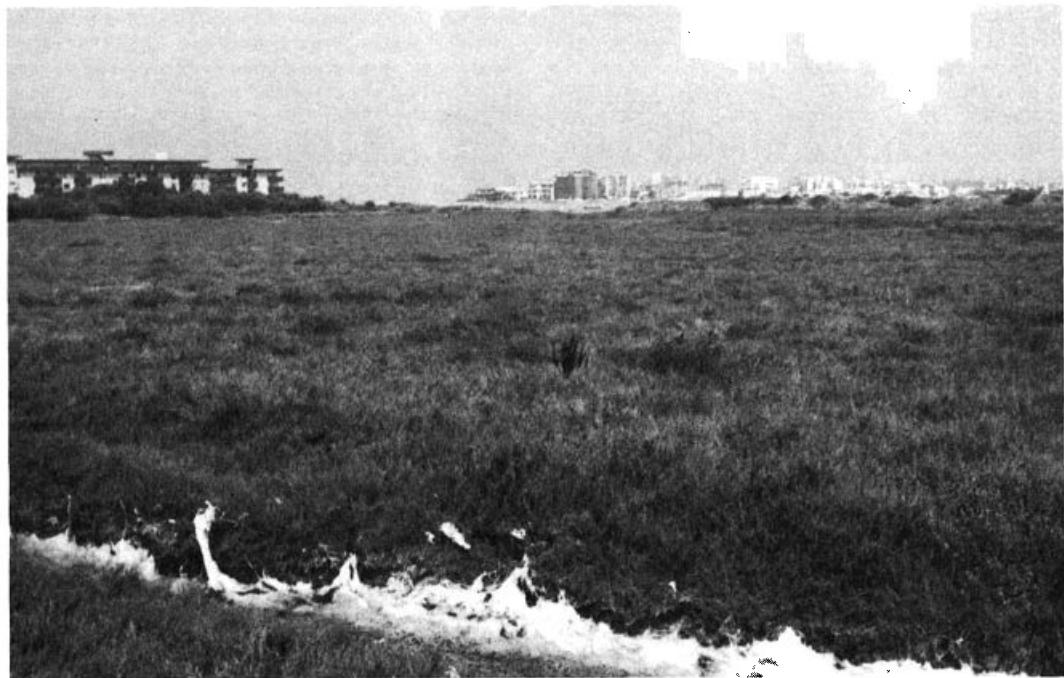
**165. DESERT RIPARIAN - FRESHWATER MARSH AND PONDS.** — **Location:** California, San Bernardino Co., 0.5 mi E of Rte 62, Big Morongo Wildlife Preserve, Morongo Valley; 34°03'N, 116°35'W, Morongo Valley Quadrangle, USGS. **Continuity:** New. **Size:** 15.38 ha = 38 acres (irregular, extreme dimensions 1320 × 1680 ft, determined from large scale map using dot grid overlay). **Description of Plot:** A desert oasis formed along a fault which forces underground water to the surface to form a permanent stream. Two ponds have been constructed in recent years. The ponds and associated marsh comprise about 5% of the plot, the rest is riparian woodland, mesquite thickets and small areas of brush. The marsh plants are primarily Bulrush (*Scirpus olneyi*) and Cattail (*Typha* sp.). Common shrub species include Honey Mesquite (*Prosopis juliflora*), Alkali Goldenbush (*Haplopappus acradenioides*), Russian Thistle (*Salsola iherica*), Saltbush (*Atriplex serenana*), Virgin's Bower (*Clematis* sp.), a woody vine, and several species of small willows that hybridize. Ground cover plants include Yerba Mansa (*Anemopsis californica*), Saltgrass (*Distichlis spicata*), and Mexican Wire Rush (*Juncus mexicanus*). Trees, 3 in. in diameter and over, based on six 0.1 acre circular samples, 162/acre, total basal area 123 ft<sup>2</sup>/acre. Species comprising 100% of the total number of trees Fremont Cottonwood (*Populus fremontii*) 59, 37, 75, 66, Red Willow (*Salix lasiandra*) 59, 37, 21, 50; and Honey Mesquite 43, 27, 4, 66. Trees by diameter size class A (3-6 in.) 79, 50, 4.9, 6; B (6-9 in.) 29, 18, 5.4, 7; C (9-15 in.) 24, 15, 12.0, 16; D (15-21 in.) 10, 16, 18.0, 23, E (21-27 in.) 6, 4, 12.4, 16; F (27-33 in.) 3, 2, 9.8, 13, G (33-40 in.) 3, 2, 14.2, 19. Shrub stems/acre 13,866, ground cover 62.5%, canopy cover 77%, average canopy height 51 ft (range 30-60 ft). Woodland and mesquite thicket 92%, ponds and marsh 5%, and brush 3%. Several foot trails cross the preserve. An unused barn, a residence converted to office space for the preserve staff, and a row of planted palm trees also are on the plot. **Topography:** Gently sloping N to S valley with hills to the S and E, descending and narrowing into a canyon that cuts through the hills to the S. **Elevation:** 2475-2530 ft. **Weather:** Mostly clear, warm to hot days (low 32° high 104°, usually 70-90°F). An unusual late, cold storm in May brought 0.91 in. of rain. **Coverage:** April 22, 28, 30, May 10, 21, 27; June 2, 6, 20; 0600-0900. Total man-

hours: 27. **Census:** Bewick's Wren 8 (52, 21); House Finch 7 (46, 18); Com. Bushtit, 5 (33, 13); Rufous-sided Towhee, 5; Anna's Hummingbird, 4 (26, 11); Ash-throated Flycatcher, 4; Yellow-breasted Chat, 4; Gambel's Quail, 3 (20, 8); California Thrasher, 3; Song Sparrow, 3; Virginia Rail, 2; Costa's Hummingbird, 2; Ladder-backed x Nuttall's Woodpecker, 2; Verdin, 2; Starling, 2; Lucy's Warbler, 2; N. Oriole, 2; Brown Towhee, 2; Am. Kestrel, 1; Am. Coot, 1; Barn Owl, 1; Great Horned Owl, 1; Black-chinned Hummingbird, 1; Black Phoebe, 1; Wied's Crested Flycatcher, 1; Phainopepla, 1; Com. Yellowthroat, 1; Hooded Oriole,; Brown-headed Cowbird (female), 1; Summer Tanager, 1; Bell's Vireo, 0.5; Yellow Warbler, 0.5; Cooper's Hawk, +; Red-tailed Hawk, +; Mourning Dove, +; Lesser Goldfinch, +; Lawrence's Goldfinch, +. **Total:** 37 species; 75 territorial males or females (488/km<sup>2</sup>, 197/100 acres). **Visitors:** Prairie Falcon, White-winged Dove, Roadrunner, White-throated Swift, W. Kingbird, Cassin's Kingbird, Vermilion Flycatcher, Scrub Jay, House Sparrow, Black-throated Sparrow. **Remarks:** 24 nests found: Great Horned Owl 1, Anna's Hummingbird 4, Costa's Hummingbird 1, Ladder-backed x Nuttall's Woodpecker hybrids 2, Wied's Crested Flycatcher 1, Ash-throated Flycatcher 1, Com. Bushtit 5, Lucy's Warbler 2, Phainopepla 1, Starling 1, Hooded Oriole 1, House Finch 3; 29 natural cavities and 13 nestboxes are found. Censusing was begun too late in the season to accurately record numbers of early nesting species such as hummingbirds, Phainopeplas, and California Thrashers. Mourning Doves, Lesser Goldfinches and Lawrence's Goldfinches were observed throughout the period, and

certainly nest there, but the number of breeding pairs could not be established. Special thanks to Doug Wilson and Babs Kobaly of Big Morongo Wildlife Preserve. — **SHARON GOLDWASSER, Kresge College, Univ. of Calif. at Santa Cruz, Santa Cruz, Calif. 95064.**

#### 166. DISTURBED COASTAL SALT MARSH. —

**Location:** California; Los Angeles Co., Venice; bordered by Ballona Creek (N), Culver Blvd. (S), Vista del Mar (W) and where Culver and Jefferson Blvds unite (E) 33°51'00"N, 118°27'00"W, Venice Quadrangle, USGS **Continuity:** New. **Size:** 8.65 ha = 21.38 acres (210 x 412 m, measured with steel tape). **Description of Plot:** *Salt cornia* salt marsh habitat with small creeks. Plot almost completely covered with uniformly low lying vegetation 2-3 ft high, mainly Pickleweed (*Salicornia virginica*) with the periphery a mixture of Ice Plant (*Carpobrotus edulis*) and Salt Grass (*Distichlis spicata*). The area cover break down is as follows: *Salicornia virginica* 61%, *Bassia hys sopifolia* 7.1%, *Distichlis spicata* 6.2%, *Carpobrotus edulis* 6.1%, *Atriplex patula* 5.3%, creek area 5%, bare ground (road or horse path) 3.8%, *Sonchus oleraceus* 2% *Frankenia grandifolia* 1.5%, *Croton californicus* 1%, *Lycium brevipes* 1%. Others present but not found in vegetation survey include, in small percentages, *Suaeda californica* and *Rumex crassus*. The earth was extremely dry and crusty. Water, channeled through the small creek passing through the entire plot, fluctuates dramatically with the ocean tides. **Edge:** Ballona Creek borders the N edge but it was not included in survey. Culver Blvd., approx. 50 yards from the S border is active between the Blvd. and the plot lie actively used stables



Census 166. Disturbed Coastal Salt Marsh. Photo/Ken Dial.

and riders pass through sections of the plot. Willows (*Salix laevigata*), border the W edge behind which are apartment complexes. The E edge is bordered by a 7 ft embankment. **Elevation:** Sea level. **Weather:** Mornings were overcast; 2.55 in. rainfall, 68°F avg. high, 53°F avg. low (from National Weather Forecast, LAX area). **Coverage:** March 19-20; April 2-4, 9-10, 23-24; May 2, 4, 11, 21-23. Total man-hours: 26. **Census:** Savannah Sparrow, 13 (150, 61); W. Meadowlark, 3 (35, 14); Song Sparrow, **Total:** 3 species; 19 territorial males (220/km<sup>2</sup>, 89/100 acres). **Remarks:** Least Terns were seen on adjacent mudflats but not found breeding. Short-eared Owl observed on two occasions, and pellets found on 5 of 15 visits. Four Savannah Sparrow nests found. — *KENNETH PAUL DIAL, 7871 W. Manchester #C, Playa del Rey, Calif. 90291.*

**167. TAMARISK - QUAILBRUSH MARSH.** — **Location:** California; San Bernardino Co., Mojave River in Afton Canyon; from 18.25 to 18.75 mi E and 13.9 to 14.1 mi N of Newberry; E½ Sec. 20, T11N, R6E, Cave Mtn Quadrangle, USGS; 35°02'N, 116°22'W. **Continuity:** New. **Size:** 21.5 ha = 53.1 acres. **Description of Plot:** Part of the streambed and floodplain of the Mojave River; includes marsh with intermittently flowing stream in S part of plot and adjacent higher and more arid ground with saltbush, Tamarisk, and other shrubs typical of alkali sink habitats in the N half. Four 100-pace toe-point transects were made to determine substrata, percent cover and species composition. The substrata were composed of 49.1% bare ground, 21.9% plant stems, 19.4% litter, 6.8% small rocks (< 2 in), and 2.8% large rocks (> 2 in). The ground and canopy cover of perennial shrub, rush, and grass species averaged 36.5%; it was composed of 31.1% Tamarisk (*Tamarix aphylla*, *T. ardensis*, *T. parvifolia*, *T. ramosissima*), 22.1% Threesquare (*Scirpus americanus*), 20.7% Salt Grass (*Distichlis spicata*), 15.2% Quail Brush (*Atriplex lentiformis*), 3.4% Cattail (*Typha angustifolia*), 2.7% unid. bulrush (*Scirpus* sp.), 2.7% Arrowweed (*Pluchea sericea*), and lesser amounts of Allscale (*A. polycarpa*), and Mesquite (*Prosopis glandulosa* var. *torreyana*, *P. pubescens*). The composition of perennials is 24.4% Tamarisk, 20.9% Salt Grass, 10.3% Quailbrush, 9.2% Threesquare, 7.2% Honey Sweet (*Tidestromia oblongifolia*), 5.7% Arrowweed, 4.9% Allscale, 4.3% unid. *Scirpus* sp., and lesser amounts of Cattail, Sea Purslane (*Sesuvium verrucosum*), Thurber Sandpaper Plant (*Petalonyx thurberi*), Desert Holly (*A. hymenelytra*), Inkweek (*Suaeda fruticosa*), Com. Reed (*Phragmites australis*), Alkali Goldbush (*Haplopappus acradenioides*), Cottontop Cactus (*Echinocactus polycephalus*) and Jimsonweed (*Datura meteloides*). The plot receives little human use; however, off-road vehicles (motorcycles) are developing trails that cross the center of the plot, individual tracks criss-cross the marsh and adjacent floodplain. **Edge:** Bounded on the NW by a small hill 160 ft high, on the NE by railroad tracks, on the SE and W by similar habitat, and on the S by a steep, rocky 800 ft high slope of the Cady Mtns. **Topography:** Two levels, separated by a bank 6 to 10 ft in height; the lower level (S) contains the marsh and intermittent stream and the higher level (N) has the Tamarisk-Saltbush association. **Elevation:** 1340 ft. **Weather:** A series of late cold fronts during May kept temperatures lower than normal. Skies were mostly clear. Temperatures 60-75°F, with light to moderate W winds.

Significant precipitation occurred May 23-24. **Coverage:** April 11, 18, 25, 20; May 9, 16, 28; June 6; 0500-0800, PST. Total man-hours: 24. **Census:** Mourning Dove, 4 (19, 8); House Finch, 3 (14, 6); Killdeer, 2; Say's Phoebe, 2; Verdin, 2; Roadrunner, 1; Red-winged Blackbird, 1; Red-tailed Hawk, +; Prairie Falcon, +; Great Horned Owl, +; White-throated Swift, +; Rock Wren, +. **Total:** 12 species; 15 territorial males (70/km<sup>2</sup>, 28/100 acres)

**Remarks:** Three Say's Phoebe nests and one each of Red-tailed Hawk, Killdeer, and Verdin were found. The hawk nest and phoebe nests were just outside the edge of the plot on the bordering cliffs. White-throated Swifts also nest in the cliffs and forage over the plot. Rock Wrens were seen with juveniles freshly out of the nest. Costa's Hummingbird and Phainopepla certainly breed on the plot but were through nesting before the census period. Virginia Rail, Com. Yellowthroat, and Lesser Goldfinch may breed but positive evidence is lacking. — *EUGENE A. and STEVEN CARDIFF, and KRISTIN H. BERRY, California Desert Plan Program, Bureau of Land Management, 1696 Spruce, Riverside, Calif. 92507*

#### 168. ARCTIC LOW FOOTHILLS TUNDRA.

**Location:** Alaska; North Slope Borough, 5 km WSW of Atkasook; 70°27'N, 157°19'W; Meade River Quadrangle, USGS. **Continuity:** New. **Size:** 25.0 ha = 61.8 acres (rectangular, surveyed and gridded). **Description of Plot:** Located within 1.5 km of the Meade River on gently undulating terrain; a mosaic of ponds, shallow lakes, old river courses interspersed with polygonized ground. While nearby river bluffs reach heights to 10 meters, vertical relief on plot itself is less than 2 m. Microtopography controlled by interactions of permafrost, seasonal thaw-freeze cycle and drainage patterns which result in heavily polygonized ground. Extensive network of low center polygons with rim heights up to 40 cm. Trough depths of high center polygons up to 1 m. 5.3 ha (21% of total) in pond or lake. Immediately after snow melt, water cover up to 51% of total area because of poor drainage. Most water depths outside of ponds or lakes under 20 cm; later up to at least 1 m, maximum probably under 1.5 m. **Vegetation:** Plot within the arctic floristic zone 3 of Young (1971, *Contr. Gray Herb.*, 201: 11-115) Vegetation mosaic closely controlled by microtopography of polygonized ground. Sedges, particularly *Carex aquatilis* and *C. chordorrhiza* dominate wetter microsites, along with several moss species (e.g., *Sphagnum* sp., *Drepanocladus* sp.); semi-bogs a mixture of sedges (esp *Rubus chaemaeorus*), and prostrate woody forms (*Salix pulchra*, *Betula nana*, and *Ledum decumbens*). Drier sites with graminoids, particularly *Eriophorum vaginatum* in tussocks, *C. bigelowii*, and *Poa* spp., as well as lichens (e.g., *Alectoria* sp. and *Cetraria* sp.), woody plants (*Vaccinium vitis-idaea*, *Salix phlebophylla*, *Ledum decumbens*), and herbs (*Dryas integrifolia*, *Pedicularis capitata*). Pond margins and lake edges grade sharply from open water through emergent stands of *Arctophila fulva* to *Carex aquatilis* marsh. The vegetation is of uniformly low stature; maximum vegetation height recorded averaged 20 cm. (Sampling consisted of 800 rectangles 40x80 cm on a 1-km transect along the long axis of the plot; other results of this sampling will be reported more fully next year.) **Edge:** Continuation of similar habitat. **Elevation:** 50 ft. **Weather:** Average June temperature 4.4°C (=40°F), a departure of 0.5°C above the 1975-6-7 average (only years data available). Snow

melt complete on plot by June 5. Weather data from station 2 km to west maintained by Naval Arctic Research Laboratory and U. S. Army Cold Regions Research and Engineering Laboratory. **Coverage:** June 7-9, 11-12, 14, 19-20, 25; July 3; concentrated during morning hours but also in afternoon. Total man-hours: 60.5. **Census:** Lapland Longspur, 24 (96, 39); Semipalmated Sandpiper, 10 (40, 16); Red Phalarope, 9 (36, 15) (nesting males); W. Sandpiper, 7 (28, 11); Oldsquaw, 5 (20, 8); Pectoral Sandpiper, 3.5 (14, 6) (nesting females); Dunlin, 3 (12, 5); Long-billed Dowitcher, 2; Willow Ptarmigan, 1.5; Black-bellied Plover, 1.5; Pintail, 1; Savannah Sparrow, 0.5; Arctic Loon, +; King Eider, +; Am. Golden Plover, +; Parasitic Jaeger, +; Glaucous Gull, +; Arctic Tern +. **Total:** 18 species 68 territorial males or females (272/km<sup>2</sup>, 110/100 acres). **Visitors:** Ruddy Turnstone, N. Phalarope. See AB 29:1135 re calculation of Pectoral Sandpiper density; 6.5 males defended territories through June, totals calculated using Pectoral male densities instead of female: 18 species; 71 territorial males or females (284/km<sup>2</sup>, 115/100 acres). **Remarks:** This census contrasts sharply with our two wet coastal plain tundra sites near Barrow (100 km north) both in species number and overall density. Much of the difference in diversity appears to result from the presence of additional habitat types within the plot. Associated with its lake edge and large ponds are Arctic Loons, Glaucous Gulls, and Arctic Terns. The first two of these breed in the Barrow region, but not on our study plots there which lack comparable habitat. Black-bellied Plovers may be responding to the presence of higher topographic features, especially exposed and barren lichen ridges; this habitat is much more extensive around Atkasook than at Barrow. Willow Ptarmigan use the extensive *Eriophorum vaginatum* tussock and willow cover here that is unavailable in the Barrow area. With other species, particularly the Long-billed Dowitcher and W. Sandpiper (both marginal Barrow breeders), the picture is less clear. Although the species discussed above contribute to species number, raising it substantially above the Barrow total, they account for only 30% of the increased density. Most of the latter is due to Lapland Longspurs, reaching a level of almost one territory per hectare. This represents a 2.7-fold increase over the Barrow density, even though at Barrow this year the Lapland Longspur was the most common breeder. Semipalmated Sandpipers also show an increase over Barrow numbers, rising almost twofold. Several factors at Atkasook probably contribute to these increases, including more extensive upland habitat juxtaposed with ponds, higher vegetation stature, warmer temperatures during nesting, earlier melt-off, and a longer season. However, we have no data presently which test the relative importance of these variables. It is interesting to note that the reverse situation holds during the post-breeding season prior to fall departure from the arctic Barrow densities and diversity are much higher than those attained around Atkasook. Mammals: 1-2 caribou grazed daily on the plots, as did brown lemmings in low density. Nests located (number successfully hatched in parentheses): Arctic Loon, 1 (1); Pintail, 1 (0); Willow Ptarmigan, 1 (0); Black-bellied Plover, 1 (1); Pectoral Sandpiper, 2 (2); Dunlin, 2 (2); Semipalmated Sandpiper, 2 (2); W. Sandpiper, 2 (2); Red Phalarope, 2 (2); Lapland Longspur, 4 (3). This work was funded by the ERDA as part of a study of shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska,

for logistic support, and the NSF Research on Arctic Tundra Environments Program for access to their Atkasook facilities. — J. P. MYERS, L. E. STENZEL, and F. A. PITELKA, Museum of Vertebrate Zoology, Univ of Calif., Berkeley, Calif. 94720.

**169. WET COASTAL PLAIN TUNDRA I. — Location:** Alaska; North Slope Borough, 3 km due S of Naval Arctic Research Laboratory, Barrow; 71°18'N, 156°42'W; Barrow Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 33.0 ha = 81.4 acres. **Description of Plot:** See AB 29:1135 (1975) **Weather:** Average June temperature 34.1°F (departure from normal +1.1°), range, 26°-43°. Average wind speed = 10.4 mph. Weather data from NOAA, Barrow, Alaska, 3 km to west. Light winter snow combined with a warm period in early June (days 1 to 13 averaged 4° above normal) produced a rapid melt-off: 50% snow free by June 5, clear by June 9, compared to clearing dates of June 12 and 14 in 1975 and 1976, respectively. Early melt, warm temperatures and clear skies together caused dry tundra conditions by late June, when water depths and soil moisture reached levels normally encountered only by late July. **Coverage:** May 30; June 3, 6, 8-9, 12, 19, 24, 28, July 3, 6, 13. Most censuses 0800-1200 but many spread over rest of day. Total man-hours: 41. **Census:** Lapland Longspur, 12 (36, 16); Semipalmated Sandpiper, 7.5 (23, 9), Dunlin, 6.5 (20, 8); Red Phalarope, 3 (9, 4); Am. Golden Plover, 2; Baird's Sandpiper, 2; Snow Bunting, 1.5, Pintail, 1; W. Sandpiper, 1; Savannah Sparrow, +. **Total:** 10 species; 36.5 territorial males or females (111/km<sup>2</sup>, 45/100 acres). **Visitors:** Oldsquaw, Ruddy Turnstone, Parasitic Jaeger. **Remarks:** As in our previous censuses, we calculated densities of Pectoral Sandpipers as the number of incubating females (see AB 29:1135). This year no females nested on or near the plot, but nevertheless several males defended territories, averaging 2.5 territories on the plot (7.5/100 ha). Totals calculated using number of Pectoral males instead of females would be: 11 species, 45 territorial males or females (135/km<sup>2</sup>, 55/100 acres) Fewer birds of fewer species bred in 1977 compared to 1975 or 1976, falling from 13 species at 159/km<sup>2</sup> (1975) and 13 species at 167/km<sup>2</sup> (1976). Part of this decline, particularly that in total species number, was due to the absence of lemming predators (jaegers and owls). Brown Lemmings were rare this year, their density estimated to lie below 1/ha compared to 5/ha and 60/ha in 1975 and 1976, respectively. But the large drop in breeding bird density, 33% below the 1975-76 average, was produced by decreases in Red Phalarope (1975-76 average = 35 incubating males/km<sup>2</sup>) and the failure in Pectoral Sandpipers (1975-76 average = 36 incubating females/km<sup>2</sup>) Low densities of these two species may have related to dry tundra conditions, as both species prefer wetter foraging sites. However, the tundra's dryness did not become apparent until after breeding birds had settled; standing water and complete saturation prevailed through the spring run-off in mid-June, by which time most nesting had commenced. Early melt-off means early availability of breeding habitat on the coastal plain generally and as a result, less coastwise pile-up of birds attempting to settle; hence the drop in density. In general, we believe that the timing of melt-off in coastal vs. interior areas, and the timing of arrival of settling birds in relation to these areas, may be the over-riding factor in determining settling densities. Other changes: Am. Golden Plovers

nested in higher density over the Barrow area than in 1975 or 1976 (6/km<sup>2</sup> compared to a 1975-76 average of 3.8/km<sup>2</sup>). Western Sandpipers were also more common, with one of six known local nests on the plot in contrast to none found near Barrow during the past two years. The presence of Pintails reflects an area-wide increase in dabbling ducks, perhaps from drought-affected regions to the south. Mallard, Green-winged Teal, and N. Shoveler were seen regularly this summer at Barrow and other Arctic coastal localities even though they normally are infrequent visitors to the Barrow region. Pintails were the most common of these invaders (see Census 170 re other duck species). Nests located (number successfully hatched in parentheses): Pintail, 1 (0); Am. Golden Plover, 1 (1); Pectoral Sandpiper, 0; Dunlin, 5 (4); Semipalmated Sandpiper, 9 (7); W. Sandpiper, 1 (1); Baird's Sandpiper, 1 (1); Red Phalarope, 3 (3); Lapland Longspur, 4 (4); Snow Bunting, 1 (0). This work was funded by the ERDA as part of a study of shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska, for logistic support. — J. P. MYERS, R. A. ERICKSON, and F. A. PITELKA, Museum of Vertebrate Zoology, Univ. of Calif., Berkeley, Calif. 94720.

**170. WET COASTAL PLAIN TUNDRA II.** — **Location:** Alaska; North Slope Borough, 3 km SSW of Naval Arctic Research Laboratory, Barrow; 71°18'N, 156°43'W, Barrow Quadrangle, USGS. **Continuity:** Established 1975; 3 consecutive years. **Size:** 27.0 ha = 66.7 acres. **Description of Plot:** See AB 29:1135-6 (1975). **Weather:** See Census 169. **Coverage:** May 30; June 3, 6, 12, 19, 24, 28; July 3, 6, 12; 0800-1300 with several afternoon visits. Total man-hours: 49. **Census:** Lapland Longspur, 10 (37, 15); Dunlin, 7 (26, 10); Semipalmated Sandpiper, 3.5 (13, 5); Am. Golden Plover, 3 (11, 5); Red Phalarope, 2 (nesting males); Ruddy Turnstone, 1.5; Baird's Sandpiper, 1.5; Pintail, 1 (nesting female); Long-billed Dowitcher, +; Snow Bunting, +. **Total:** 10 species; 29.5 territorial males or females (109/km<sup>2</sup>, 44/100 acres). **Visitors:** Oldsquaw, N. Phalarope, Parasitic Jaeger. **Remarks:** See preceding census re calculation of Pectoral Sandpiper density. Although none nested on this plot an average of 2.5 males defended territories

through June. Totals calculated using Pectoral male densities: 11 species; 32 territorial males or females (119/km<sup>2</sup>, 48/100 acres). As in the preceding census, total species number and total densities are down from 1975 (12 spp, 143/km<sup>2</sup>) and 1976 (15 spp, 148/km<sup>2</sup>) figures. Much of the decline is owing to the failure of Pectoral Sandpipers and reduction in Red Phalarope breeding (average 1975-76 densities = 28/km<sup>2</sup> and 39/km<sup>2</sup>, respectively). In past years this plot has also supported many Steller's Eider (1975-76 average = 16.7/km<sup>2</sup>) and a few Oldsquaw (1.9/km<sup>2</sup>), neither of which bred here this year. (Oldsquaws may have nested in the Barrow area in low density; Steller's Eider did not). Pintails had not bred here during prior censuses; the one nest reflects an area-wide increase in dabbling ducks (see preceding census) Other changes: No lemming predators; increases in Semipalmated Sandpiper (1975-76 average = 6.5/km<sup>2</sup>), Am. Golden Plover (1975-76 average = 4.6/km<sup>2</sup>), and Baird's Sandpiper (bred before only as + in 1976). The large increase in these shorebirds combined with smaller changes in Dunlin and Ruddy Turnstone partially offset a decline in overall shorebird breeding effort caused by Pectoral and Red Phalarope decreases (70 shorebirds/km<sup>2</sup> in 1977 vs. 101/km<sup>2</sup>, average for 1975-76). Lapland Longspurs also increased markedly from a 1975-76 average of 19/km<sup>2</sup>. Many of the species showing increases prefer drier habitats than the two suffering the greatest decreases. Lapland Longspur, Am. Golden Plover, Baird's Sandpiper, as well as Dunlin and Semipalmated Sandpiper, all utilize mesic and dry areas more heavily than either Pectoral Sandpipers or Red Phalaropes, yet throughout the settling period for nesting birds the tundra was largely saturated, and in fact unusually high densities of Am. Golden Plovers already were noted in the first 3 days of June, i.e., before melt-off. See preceding census for additional comment. Nests located (number successfully hatched in parentheses): Pintail, 1 (0); Am. Golden Plover, 3 (2); Pectoral Sandpiper, 0, Dunlin, 2 (2); Semipalmated Sandpiper, 2 (1); Baird's Sandpiper, 1 (1); Red Phalarope, 2 (1); Lapland Longspur, 4 (4). This work was funded by the ERDA as part of a study of shorebird ecology. We thank the Naval Arctic

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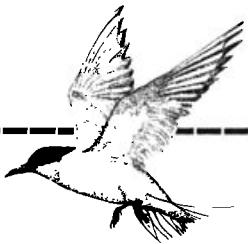
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**171. WET COASTAL TUNDRA I.** — Location Alaska; Cape Krusenstern, 55 km NW of Kotzebue, 67°7'11"N, 163°42'31"W; Nbatak (A-4) Quadrangle, USGS. Continuity: New. Size: 29.75 ha = 73.5 acres (rectangular, 350 x 850 m, surveyed and gridded at 50 m intervals). Description of Plot: Crossed by a series of approximately 13 parallel low ridges (up to 2 m above troughs) of gravel formed as former ocean beaches. One pond (area = 1 ha), partially in plot, plus many shallow water troughs, mainly with emergent vegetation. Ridge vegetation, in decreasing order of area covered: lichens (several species), Crowberry (*Empetrum nigrum*), Dwarf Birch (*Betula nana*), Willow (*Salix*, several species), moss (several species), *Potentilla villosa*, River Beauty (*Epilobium latifolium*). Dominant emergent in troughs is *Carex aquatilis*, with other sedges (*Carex*), willow (*Salix*) and grasses (*Arctagrostis latifolia* and others). Other wet areas are mainly Dwarf Birch, willow, moss sedges and grasses. By area, open water covers 5%, dry ridges 53%, emergent vegetation 20% and other wet tundra 22%. Edge: Similar beach ridge tundra continues on three sides; to the W, the present ocean beach is 200 m from the plot. Topography: Flat tundra, a series of beach ridges between the ocean and a large brackish lagoon. Maximum elevation 8 m (25 ft.); higher land (more than 100 m) beginning 7 km inland. Weather: June was unusually clear and dry; average temperature (mean of daily maxima and minima) was 5.2°C (41.3°F). Temperature range -3.3 to 17.8°C (26 to 64°F). Total rainfall 0.28 in. Snow cover less than 10% by May 28. Coverage June 3, 8, 14, 19, 23, 28; July 3, 9, 14, 19; 0400-1600 Total man-hours: 31. Census: Savannah Sparrow, 13 (44, 18); Lapland Longspur, 8.5 (29, 12); N. Phalarope, 5 (17, 7); Semipalmented Sandpiper, 2.5; W. Sandpiper, 2; Long-billed Dowitcher, 2; redpoll, 2; Willow Ptarmigan, 1; Am. Golden Plover, 1; Pectoral Sandpiper, 1; Red-throated Loon, 0.5; Oldsquaw, 0.5; Com. Snipe, 0.5; Black-bellied Plover, +. Total: 14 species; 39.5 territorial males or females (153/km<sup>2</sup>, 54/100 acres). Visitors: Pintail, Sandhill Crane, Whimbrel, Dunlin, Parasitic Jaeger, Long-tailed Jaeger, Com. Raven. Remarks Although Parasitic and Long-tailed Jaegers did not appear to nest in the area, both species were present throughout the breeding season. Mammalian predators present were Arctic and Red Foxes. No microtines were observed. This work was supported by BLM and NOAA as part of the Outer Continental Shelf Environmental Assessment Program (OCSEAP). — PETER G. and CAROLYN S. CONNORS, Bodega Marine Laboratory, Univ. of Calif., Bodega Bay, Calif. 94923.

**172. WET COASTAL TUNDRA II.** — Location Alaska; 4 km (2.5 mi) N of Cape Prince of Wales, 65°38'N, 167°04'W; Teller Quadrangle (C-7) USGS. Continuity: New. Size: 25 ha = 61.78 acres (250 m x 1 km, surveyed and gridded). Description of Plot: Dominant ground cover (approximate percentages for vegetated area only): Sedge (*Carex*) 55%, moss 25%, willow (*Salix*) 5%, crowberry (*Empetrum nigrum*) 5%, and lichens 5%. Water cover = 12%, including 5 lakes averaging 30 m width, 13 small ponds averaging 2 m across, and minor areas of flooding. Edge: Bordered on all sides by similar tundra. Topography: Flat, with 1 m ridges separating 2

wet areas of low ground from 2 moist areas of higher ground. **Elevation:** Less than 50 ft. **Weather:** Cool and windy. Average June temperature 3.6°C (38.4°F); Temperature range -1.7° to 12.8°C (29° to 55°F). **Coverage:** June 15, 20, 25, 30; July 7, 10, 15, 20; 1100-1700. Total man-hours: 45.5. **Census:** Western Sandpiper, 17 (68, 28); Dunlin, 5 (20, 8); Lapland Longspur, 2; Pintail, 1; Oldsquaw, 1; Long-billed Dowitcher, 1; Red Phalarope, 1, N. Phalarope, 1. **Total:** 8 species; 29 territorial males or females ( $116/\text{km}^2$ , 47/100 acres). **Visitors:** Red-throated Loon, Am. Golden Plover, Pectoral Sandpiper, Parasitic Jaeger, Glaucous Gull, Arctic Tern. **Remarks:** Nests found: Western Sandpiper 15, Dunlin 4, Pintail 1, Oldsquaw 1, Long-billed Dowitcher 1, Red Phalarope 1, N. Phalarope 1, Lapland Longspur 1. Reindeer herds trampled or disturbed several nests in early July. No microtines were seen on the plot. We thank Polar Research Laboratories for supplying us with weather data. This work was supported by BLM and NOAA as part of the Outer Continental Shelf Environmental Assessment Program (OCSEAP). — **KATHERINE HIRSCH and DOUG WOODBY, Bodega Marine Laboratory, Univ. of Calif., Bodega Bay, Calif. 94923.**

**173. OLD FIELD.** — **Location:** Pennsylvania; Schuylkill Co., 1 mi SW of Weishampe; 40°41'N, 76°27'W, Tremont Quadrangle, USGS. **Continuity:** Established 1974; 4 consecutive years. **Size:** 7.11 ha = 17.58 acres. **Description of Plot:** See AB 28:1053 (1974). **Weather:** Cool to moderately warm with temperatures 52°-76°F. Most count days were clear with some early morning haze; one was cloudy with light rain. **Coverage:** May 26; June 1-2, 15, 20-21, 28; July 1; 0535-0845, Total man-hours: 8. **Census:** Field Sparrow, 16 (225, 91); Com. Yellowthroat, 6 (84, 34); Indigo Bunting, 4 (56, 23); Rufous-sided Towhee, 4; House Wren, 3 (42, 17); Yellow-breasted Chat, 2; Cardinal, 2; Am. Goldfinch, 2; Gray Catbird, 1; Wood Thrush, 1; Red-eyed Vireo, 1; Golden-winged Warbler, 1; Blue-winged Warbler, 1; Yellow Warbler, 1; Yellow-billed Cuckoo, +; Am. Robin, +; E. Bluebird, +; Red-winged Blackbird, +; N. Oriole, +; Scarlet Tanager, +; Song Sparrow, +. **Total:** 21 species; 45 territorial males or females ( $633/\text{km}^2$ , 256/100 acres). **Visitors:** Mourning Dove, Com. Flicker, Downy Woodpecker, Blue Jay, Cedar Waxwing, Chipping Sparrow. — **ROLAND BERGNER, 1252 Barley Corn Square, Harrisburg, Pa. 17112.**

**174. ORCHARD GRASS-TIMOTHY FIELD.** — **Location:** Pennsylvania; Washington Co., 2.5 mi WSW of intersection of Routes 136 and 917; 40°12'12"N, 80°03'06"W, Hackett Quadrangle, USGS. **Continuity:** New. **Size:** 12.68 ha = 31.34 acres (irregular, roughly 1300 × 1050 ft, entire perimeter measured with steel tape and Brunton compass). **Description of Plot:** There are three small clumps of Black Cherry (*Prunus serotina*); 90% of the field is Orchard Grass (*Dactylis glomerata*) and Timothy (*Phleum pratense*). Other dominant species are Red Clover (*Trifolium pratense*), goldenrod (*Solidago* sp.), Ironweed (*Vernonia* sp.), blackberry (*Rubus* sp.), and Upright Cinquefoil (*Potentilla recta*). **Edge:** Surrounded on all sides except the S by second-growth woodland. To the S the field is bounded by a narrow band of trees which divides it from an overgrown pasture. **Topography:** Divided approximately in half by a N-S trending ridge, this creating E and W facing slopes of 9-10°. **Elevation:** 1100-1220 ft. **Weather:** Rain on 1, cloudy on 5 of 15 trips. **Coverage:** May 29-30; June 1-3,

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7-8, 10-11, 16, 22, 24, 28; 0600-2100. Total party-hours. 20 25. **Census:** Henslow's Sparrow, 10 (79, 32); Field Sparrow, 4 (32, 13); Red-winged Blackbird, 3 (24, 10); Grasshopper Sparrow, 3; E. Meadowlark, 2; Brown-headed Cowbird, 1; Savannah Sparrow, 1; Sharp-shinned Hawk, +; Red-tailed Hawk, +; Am. Kestrel, +; Chimney Swift, +; Barn Swallow, +; Com. Crow, +; Com Grackle, +; Indigo Bunting, +. **Total:** 15 species; 24 territorial males or females ( $189/\text{km}^2$ , 77/100 acres). **Visitors:** Ring-necked Pheasant, Rock Dove, Mourning Dove, Com. Flicker, Red-bellied Woodpecker, Brown Thrasher, E. Bluebird, Starling, Com. Yellowthroat, Am. Goldfinch. **Remarks:** The plot, located in a section of Mingo Creek Co. Park closed to the public, had been a hayfield until 1972. It has been mowed irregularly by the park since that time. Since Henslow's Sparrows had been seen and heard in this field in 1975 and 1976 and since the quality of hay is extremely poor, park officials had been prevailed upon to forego mowing until later in the fall. A Grasshopper Sparrow nest containing four eggs was found. Thanks to members of the Audubon Society of Western Pennsylvania for their help and to Washington Co. commissioners and park officials for their cooperation. Special thanks to Glen Phillips for his invaluable advice and assistance. — *LORINDA M. RICHARDSON, ROGER V. and MARGARET A. HIGBEE (compilers), 219 Blue Jay Drive, Canonsburg, Pa 15317.*

**175. ABANDONED FIELD.** — **Location:** Maryland; Prince George's Co., Accokeek, Piscataway Park, Potomac River, 3 mi W intersection of Rte 210 and Bryan Pt Rd, 38°41'N, 77°4'W, Mt. Vernon Quadrangle, USGS. **Continuity:** Established 1972; 6 consecutive years. **Size:** 6.07 ha = 15 acres. **Description of Plot:** See *AB* 26:995-996 (1972). **Weather:** The summer was cool and dry. **Coverage:** April 28; May 2, 6, 9, 12, 17, 22, 30; June 4, 12, July 3; 0650-1035, Total man-hours: 22. **Census:** Field Sparrow, 6 (99, 40); Com. Yellowthroat, 5 (82, 33); Indigo Bunting, 4 (66, 27); Bobwhite, 2; Yellow-breasted Chat, 2; Cardinal, 2; Blue Grosbeak, 2; Am. Goldfinch, 2; Song Sparrow, 2; E. Kingbird, 1; White-eyed Vireo, 1; Prairie Warbler, 1; Rufous-sided Towhee, 1. **Total:** 13 species; 31 territorial males or females ( $511/\text{km}^2$ , 207/100 acres). **Remarks:** Nest found: Field Sparrow. Carolina Wren and E. Meadowlark did not nest this year. Com. Yellowthroat increased from 3 territorial males to 5 and two new species utilized the plot: White-eyed Vireo and Prairie Warbler. Other population levels remained stable. — *LEONARD TEUBER and M. KATHLEEN KLIMKIEWICZ (compiler), 13117 Larchdale Rd., No. 2, Laurel, Md. 20811.*

**176. ORCHARD GRASS - TALL FESCUE MEADOW.** — **Location:** Illinois; McLean Co., 6 mi S Gridley; T25N, R2E, SEY4, NW ¼, Sec. 5, Normal Q, 15' series, USGS. **Continuity:** Established 1976. **Size:** 12.1 ha = 30 acres. **Description of Plot:** See *AB* 31:88-89 (1977). **Coverage:** May 27; June 14, 16-17, 20; 0600-2000. Total man-hours: 10. **Census:** Red-winged Blackbird, 19 (156, 63); Short-billed Marsh Wren, 5 (41, 17); E. Meadowlark, 3 (25, 10); E. Kingbird, 1; Com. Yellowthroat, 1; Bobolink, 1; Dickcissel, 1; Ring-necked Pheasant, +; Barn Swallow, +; Am. Goldfinch, +. **Total:** 10 species; 31 territorial males ( $255/\text{km}^2$ , 103/100 acres). **Remarks:** The total population was the same as in 1976; Short-billed Marsh Wrens appeared this year while Dickcissels declined from 6 to 1. Only 17 female Red-

winged were observed, compared to 33 last year — *DALE BIRKENHOLZ, Illinois State Univ., Normal, Ill 61761.*

**177. ANNUAL GRASSLAND.** — **Location:** California; Orange Co., 7 mi E of San Juan Capistrano, Starr Ranch Audubon Sanctuary; N side of S Preusker Rd, 1.3 mi from Bell Canyon Rd.; 33°30'N, 117°31'W, Canada Gobernadora Quadrangle, USGS. **Continuity:** New **Size:** 12.6 ha = 31.13 acres (rectangular, 315 X 400 m, measured with steel tape). **Description of Plot:** The dominant plant forms are native and introduced grasses, as a whole extremely dense with an average height of 50 cm. A stem counting-random point sample technique yielded the following densities: Oats (*Avena spp.*) 42%, Brome Grass (*Bromus spp.*) 12% and Needle Grass (*Stipa spp.*) 46%. Grasses of the genus *Hordeum* were present but not in any great number. *Stipa* is the only native grass. On two hectares Decorative Artichoke (*Cynara cardunculus*) is intermixed with grasses. Less than one-fourth of a hectare is covered by three patches of Prickly Pear Cactus (*Opuntia spp.*) growing in the NE corner. Two shrubs, Elderberry (*Sambucus mexicana*) and Laurel Sumac (*Rhus laurina*) grow in the largest of the three cactus patches. **Edge:** Surrounded by similar grasslands on three sides and on the fourth by riparian woodlands. **Topography:** Part of a marine terrace that borders a canyon. Ten hectares are flat and the remaining portion slopes 45°. **Elevation:** 800 ft. **Weather:** April was unseasonably hot and May was unseasonably wet. Precipitation measured 2.49 in. 2.34 in. fell during the first 10 days of May. The high temperature was 85° and the low was 39°F; average high 68°, average low 44°F (temperatures from Starr Ranch Audubon Sanctuary Headquarters, 2 mi N). **Coverage:** April 9-10, 14-15, 23-24, 29-30; May 7, 14-15, 20; 0430-1930, PST. Total man-hours: 47. **Census:** Grasshopper Sparrow, 8 (64, 26); W. Meadowlark, 4 (32, 13); Anna's Hummingbird, 2; Cactus Wren, 1; Brown Towhee, 1. **Total:** 5 species, 16 territorial males ( $127/\text{km}^2$ , 51/100 acres). **Visitors:** White-tailed Kite, Ash-throated Flycatcher, Black Phoebe, Black-chinned Sparrow. **Remarks:** A Cactus Wren nest with 2 eggs was located. The White-tailed Kite was seen foraging on 9 different days. — *THOMAS E LaROCQUE, 2502 Del Amo Blvd., Lakewood, Calif., 90712.*

**178. ANNUAL GRASSLAND.** — **Location:** California; Riverside Co., 2.2 mi N of Lakeview P.O. on E side of Davis Road, San Jacinto Valley; 33°52'N, 117°7'W, Perris Quadrangle, USGS. **Continuity:** Established 1976 **Size:** 8.1 ha = 20 acres. **Description of Plot:** See *AB* 31:89 (1977). **Weather:** Heavy overcast or rain on 4 days, otherwise clear and warm. **Coverage:** May 23-24, 28-30, June 2-5; 0715-1035, except one trip 1500-1600. Total man-hours: 12. **Census:** Burrowing Owl, 4 (49, 20); Starling, 4; W. Meadowlark, 3 (37, 15); Loggerhead Shrike, 2; Anna's Hummingbird, 1. **Total:** 5 species; 14 territorial males or breeding females ( $173/\text{km}^2$ , 70/100 acres). **Visitors:** Marsh Hawk, Red-tailed Hawk, Golden Eagle, California Quail, Mourning Dove, *Empidonax* sp., Com Raven, Com. Crow, Phainopepla, Red-winged Blackbird. **Remarks:** Four nests were located: Burrowing Owl, 1 with 2 nearly full-grown young and 2 each with 6 half-grown young; Starling, 1 with 4 young. — *VERNON C BLEICH and KATHLEEN M. BLEICH, 41758 Laurie Lane, Hemet, Calif. 92343.*

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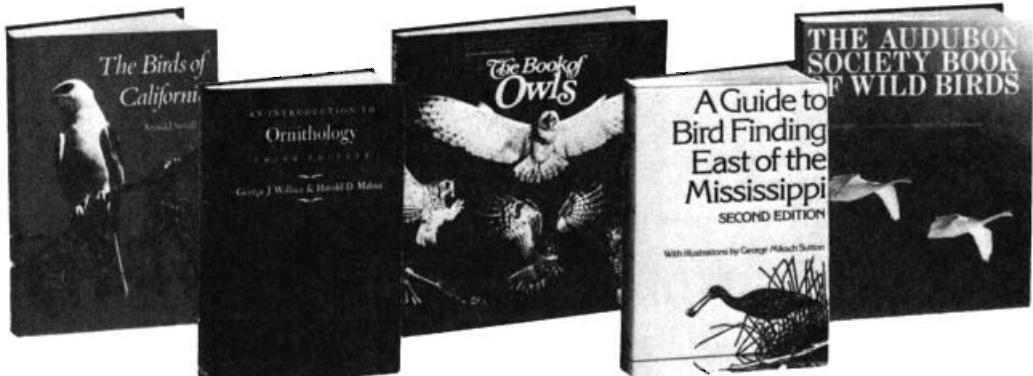
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**179. RESIDENTIAL AREA.** — **Location:** North Carolina; Carteret Co., Pine Knoll Shores on Bogue Bank, 34°41'45"N, 76°49'W, Mansfield Quadrangle, USGS. **Continuity:** New. **Size:** 10.12 ha = 25.0 acres (rectangular, 1100 X 990 ft, surveyed). **Description of Plot:** A series of well-defined ridges and swales (the ridges vegetated with oak-pine forest, the swales containing swamp forest), now being converted to a residential area. The swales have been filled with sand from a nearby canal, thus destroying the swamp forest. However, much relatively undisturbed vegetation remains on the ridges. Currently, the plot is composed of (by area): relatively undisturbed ridge vegetation (oak-pine), 50.4%; pavement, 15.5%; sparsely vegetated sand fill, 15.1%; lawns, 11.8%; houses, 6.8%; water, 0.4%. **Weather:** Temperatures normal, precipitation below normal. **Coverage:** May 12, 15, 17-18, 28, 31; June 1-2, 4, 15; 0630-0900, EDST Total man-hours: 34. **Census:** Cardinal, 8.5 (84, 34); Com. Grackle, 7 (69, 28); Mockingbird, 5.5 (54, 22); Carolina Wren, 4.5 (44, 18); Mourning Dove, 4 (40, 16); Blue Jay, 4; Starling, 2; Orchard Oriole, 2; Great Crested Flycatcher, 1.5; Painted Bunting, 1.5; Yellow-billed Cuckoo, 1; Brown Thrasher, 1; White-eyed Vireo, 1; Rufous-sided Towhee, 0.5. **Total:** 14 species; 44 territorial males (nests in the cases of Com. Grackle and Starling) (435/km<sup>2</sup>, 176/100 acres). — **JOHN O. FUSSELL III, P. O. Box 520, Morehead City, N.C. 28557**

**180. URBAN RESIDENTIAL.** — **Location:** Ontario; Waterloo, William, King, Union Sts., CN Railway; 43°27'N, 80°31'W, Waterloo-Kitchener West, NTS. **Continuity:** New. **Size:** 25.5 ha = 63 acres (square, measured from map, scale 1:1200). **Description of Plot:** Originally developed as a residential area in 1875; single family, 2-story dwellings, total 234 or 3.7/acre; vacant lots, 7; commercial buildings, 8; multiple family dwellings, 3; churches, 3; school, 1. Vegetation: The dominant canopy trees are Sugar Maple (*Acer saccharum*), Box-Elder (*A. negundo*), Silver Maple (*A. saccharinum*), and Norway Maple (*A. platanoides*). Cultivated Blue Grass is the most prominent ground cover. Backlot fruit, vegetable, and flower gardens provide variety. A quantitative

vegetation survey yielded the following results. Trees 4 in. dbh, based on a 50% random sampling of residential lots, produced an average tree density of 20/acre, with a total average basal area of 34.3 ft<sup>2</sup>/acre. Species comprising 90% of the total number of trees: (numbers following name are Density (trees/acre), Frequency %, Basal Area in sq ft/acre, and Importance Value); Sugar Maple, 7, 35, 17.9, 124; Box-Elder, 4, 18, 4.4, 51; Silver Maple, 1, 4, 2.4, 15; Norway Maple, 3, 13, 29, 36; Coniferous (Norway Spruce, Scotch Pine and White Cedar), 3, 12, 1.4, 30; Horse Chestnut, 1, 2, 1.3, 9; Black Walnut, 1, 3, 0.5, 8. Average tree canopy density is 34% (range: 20-49) Average tree height is 55 ft (estimated). **Edge:** Bordered on 4 sides by similar mix of land use and vegetation. The Waterloo CBD meets one corner of the plot. **Topography:** Flat. **Elevation:** 1070 ft. **Weather:** Normal to above average temperatures. **Coverage:** May 11, 26; June 8, 20, 27; July 5, 8; 0600-0900, or 1800-1930. Total man-hours: 16. **Census:** Rock Dove, 16 (male and female) (63, 25); House Sparrow, 15 (59, 24); Starling, 11 (43, 17); Cardinal, 3.5 (14, 6); Am. Robin, 3 (12, 5); Blue Jay, 1; Chipping Sparrow, 1; Am. Kestrel, +; Mourning Dove, +; Com. Flicker, +; Black-capped Chickadee, +; Com Grackle, +; Song Sparrow, +. **Total:** 13 species; 50.5 territorial males or females (198/km<sup>2</sup>, 80/100 acres) **Visitors:** Com. Nighthawk, Chimney Swift. **Remarks:** Nests located; Starling, 6; House Sparrow, 10; Rock Dove, 6 colonies (1 large colony destroyed by building owner at mid-point of census). Thanks to M.S. Allen, for vegetation description. — **G. R. DONALDSON, D F MUTRIE, Ecoplans Ltd., 544 Conestogo Rd., W Waterloo, Ontario, N2L 4E3**

**181. VILLAGE RESIDENTIAL.** — **Location:** Ohio, Wyandot Co., on the W edge of Carey; approximately 40°57'N, 83°23'15"W; Upper Sandusky Quadrangle, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (27.33 acres of Shrine Park area; remainder, strictly residential. Measured by odometer, pacing, and village map interpretation). **Description of Plot:** West of area censused in 1976 to include Carey Shrine area, park-like and mowed, a pine plantation (0.8 acres); and an open area through which Spring Run flows. To include also two residential

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sections, the northernmost extending from Clay Street N to West Findlay Street; bounded on the E by South Muncie Street, and on the W by the Shrine area and local fields. The southernmost section, a single row of homes, extends S from Clay Street on the W side of South Muncie Street to an open grassy zone. Not included is a grassy field E of the Shrine area and W of the residential section south of Clay Street. Artifacts include the Shrine, prayer stations constructed with tufa rock, shelters, and rest rooms. Except in the pine planting (*Pinus strobus*), trees are widely spaced (25-50 ft) along black-topped driveways. Mature trees are mostly Chinese Elm; small-diameter ones are varieties of Norway Maple (*Acer planatoides*). A row of Norway Spruce (*Picea abies*) occurs along the S border, adjacent to a vegetated railroad right-of-way. Along the W border three rows of evergreens (White Cedar, Norway Spruce, Red Pine) have been planted which are now about 3 ft high. Juniper lines a portion of one driveway, while White Cedar (*Thuja*

*occidentalis*) occurs at most of the prayer stations. **Weather:** Severe winter weather in January; early Spring, and continuing lack of rainfall into summer. **Coverage:** Almost daily in March, April, and May, and regularly each week through June and July; irregularly in August Total man-hours: about 65. **Census:** Com. Grackle, 25 (154, 63); House Sparrow, 13 (80, 33); Am. Robin, 11 (68, 28); Song Sparrow, 9 (56, 23); Starling, 8 (49, 20); Mourning Dove, 7 (43, 18); House Wren, 6 (37, 15); Chipping Sparrow, 6; Gray Catbird, 3 (19, 8); Cardinal, 3; Blue Jay, 2; Brown-headed Cowbird, 2; Brown Thrasher, 1; Field Sparrow, 1. **Total:** 14 species; 97 territorial males (599/km<sup>2</sup>, 243/100 acres). **Remarks:** The number of pairs of grackles was made equivalent to the 25 nests believed to be occupied rather than trying to rely on counts of males or females. Although cowbirds were noted no eggs were found in nests. —A. H. CLAUGUS, 228 S. Lake St., Carey, Ohio, 43316.

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