

Thirty-ninth Breeding Bird Census

*Edited by Willet T. Van Velzen**

Up, up and away! So continues the growth of the Breeding Bird Census; this year rising to an all time high of 165. Another half dozen came in too late to be published. Even the total number of States/Provinces reporting (34) is the highest ever participating.

North Dakota's high total of 18 census plots edged California, with 12, out of the top spot it has held for the past two years and placed it in a tie for second place with Pennsylvania, followed by New York with 11 and West Virginia with 10. Yet, although only in fifth place, West Virginia with

106, still leads by a considerable margin in the total number of plots ever submitted.

Several excellent reports were received from states (and habitats) for which we have previously had little if any data. Tundra reports from Alaska and new studies from Utah, Louisiana, and Montana were most welcome, indeed. But, pray tell, don't any birds breed in Nevada?

Deep and sincere appreciation is extended to the vast majority of workers who sent their reports in before the deadline date and took great care in the preparation of their manuscripts.

*c/o American Birds, 950 Third Ave., New York, N Y 10022.

LIST OF CENSUSES

Eastern—Deciduous Forest

1 Second Growth Hardwood Forest	Connecticut
2 Suburban Wildlife Sanctuary—Mixed Habitat	Connecticut
3 Red Maple Forest	New York
4 Mixed Upland Forest	New York
5 Birch—Maple—Oak Forest	Pennsylvania
6 Birch—Tulip-tree Forest	Pennsylvania
7 Disturbed Upland Oak Forest	Pennsylvania
8 Elm—Cherry Forest	Pennsylvania
9 Mountain Top, Oak—Maple Forest	Pennsylvania
10 Second Growth Hardwood Forest	Pennsylvania
11 Oak—Tulip-tree—Beech Forest	West Virginia
12 Mature Northern Hardwoods	West Virginia
13 Oak—Beech—Tulip-tree Forest	West Virginia
14 Oak—Maple—Hickory Forest	West Virginia
15 Oak—Maple Woodland	West Virginia
16 Upland Oak—Hickory Forest	West Virginia
17 Young Oak Forest	West Virginia
18 Deciduous Forest with Pond and Brook	New Jersey
19 Upland Tulip-tree—Maple—Oak Forest	Maryland
20 Upland Mixed Forest with Small Creek	Maryland
21 Mixed Hardwood Forest	Maryland
22 Hickory—Oak—Ash Floodplain Forest	Maryland
23 Mature Deciduous Floodplain Forest	Maryland
24 Mixed Upland Habitat	Washington, D.C.
25 Upland Oak—Hickory Forest	Virginia
26 Upland Tulip-tree—Oak Forest	Virginia
27 Mixed Deciduous Forest	North Carolina
28 Upland Mixed Forest	North Carolina
29 Mountain Ravine Mixed Forest	Georgia
30 Red Oak—Sugar Maple Forest	Ontario
31 Wooded City Ravine	Ontario
32 Mature Mixed Hardwood Forest	Michigan
33 Mixed Hardwood Forest	Michigan
34 Northern Hardwoods	Michigan
35 Oak—Maple Forest and Edge	Illinois
36 Beech—Maple Forest	Indiana
37 Black Oak—Sassafras Woods	Indiana
38 Swamp Forest	Indiana

39 Virgin Beech—Maple Forest	Ohio
40 Mixed Deciduous Forest	Tennessee
41 Tupelo Swamp	Louisiana
42 Oak—Hickory Forest	Kansas
43 Virgin Scrub Oak Foothills	Oklahoma

Eastern—Coniferous-Deciduous (Mixed)

44 Balsam Fir—Birch Forest	Minnesota
45 Deciduous—Coniferous Second-growth Northwoods	Vermont
46 Burned Pine—Oak Forest	Massachusetts
47 Deciduous—Coniferous Low-lying Island	Massachusetts
48 Pitch Pine—Scrub Oak Forest IV, 1974	Massachusetts
49 Pitch Pine—Scrub Oak Forest IV, 1975	Massachusetts
50 Climax Hemlock—White Pine Forest	Connecticut
51 Upland Mixed Pine—Spruce—Hardwood Plantation	New York
52 Hemlock—Mixed Birch	Pennsylvania
53 Mixed Hardwood—White Pine Forest	Pennsylvania
54 Hemlock—Tulip-tree Forest	West Virginia
55 Oak—White Pine Forest	West Virginia
56 Coastal Mixed Pine—Oak Forest	North Carolina
57 Mixed Pine—Hardwood Forest	Texas

Eastern—Coniferous

58 Tamarack—White Cedar Slough	Ontario
59 White Pine—White Cedar Forest	Ontario
60 Scotch Pine Plantation	New York
61 Upland Scotch Pine Plantation	New York
62 White Pine Plantation	Massachusetts
63 Red Pine Plantation	Massachusetts

Eastern—Mixed Habitats

64 Aspen Clear-cut	Minnesota
65-66 Burned Jack Pine Ridge (I, II)	Minnesota
67 Horse Farm and Second-growth Edge	Vermont
68 Mixed Forest, Old Field and Homesite	Vermont

69	Arboretum, Coniferous Parkland	Massachusetts	Western—Coniferous	
70	Arboretum: Deciduous Parkland	Massachusetts	117.-118. Bishop Pine Forest	California
71	Mixed Upland Habitat and Swamp	Connecticut	119. Disturbed Bishop Pine Forest	California
72	Upland Brushy Pasture	Connecticut	120. Logged Douglas-fir-Reseeded with Pine	Monterey California
73	Abandoned Hayfields with Few Trees	Ontario	121. Mature Douglas-fir Forest	California
74	Abandoned Hayfields with Scattered Hedgerows	Ontario	122. Ponderosa Pine Forest	Colorado
75	Apple Orchard, Cultivated Fields and Marsh	Cattail Ontario		
76	Upland Deciduous Forest and Abandoned Fields	Ontario		
77	Wooded Ravine, Floodplain and River	Ontario	Western—Mixed Habitats	
78 -79.	Shrub Community (I, II)	New York	123. Scattered Mixed Coniferous Forest	Oregon
80	White Pine-Red Maple- Leatherleaf Bog	New York	124. Coastal Scrub	California
81	Bog—Mixed Hardwood Evergreen Edge	Pennsylvania	125.-126. Disturbed Coastal Scrub (A-B)	California
82	Old Field—Meadow and Primary Deciduous Thickets	Pennsylvania	127. Serpentine Chaparral	California
83	Mixed Upland Habitat	Maryland	128. Sage Brush-Pothole Grassland	Montana
84	Field with Hedgerows	Tennessee	129. Cottonwood Riverbottom- Pasture	Colorado
85	Brushy Fields and Homesite	Ohio	130. Reservoir Shoreline Cottonwood Forest	Cottonwood Forest
86	Disturbed Oak-Hickory Forest, Pine Stand, Edge and Pond	Ohio		Colorado
87	Grassy Marsh—Deciduous Forest	Ohio		
88	Hickory-Maple Park Woodland	Ohio		
89	Seeded Strip Mine	West Virginia	Northern—Deciduous	
90	Deciduous Clearcut	Tennessee	131. Paper Birch Forest	Alaska
91	Mixed Deciduous—Pine and Pastureland	Mississippi	132. Aspen—Willow Forest	British Columbia
92	Arboretum	Louisiana	133. Black Cottonwood Floodplain Forest	British Columbia
93	Impounded Bayou—Gum—Oak— Beech Forest	Louisiana		
Central—Prairie				
94	Mixed Prairie Grassland	Montana	Northern—Coniferous	
95	Kentucky Blue Grass Prairie	North Dakota	134. Black Spruce Forest	Alaska
96 -100.	Mixed Prairie (I-V)	North Dakota	135. Subalpine Conifer Forest	British Columbia
101	Mid-Grass Prairie	South Dakota	136. Lodgepole Pine Forest	British Columbia
102	Prairie Dog Town	South Dakota		
103	Floodplain Tallgrass Prairie	Kansas	Northern—Mixed	
104	Virgin Tallgrass Prairie	Oklahoma	137.-138. West Coastal Plain Tundra (I, II)	Alaska
105	Disturbed Mixed Prairie	Illinois	139. Black Spruce Scrub— Muskeg	Northwest Territories
Central—Mixed Habitat				
106	Floodplain Tallgrass Prairie— Shrub Succession	Kansas	140. Disturbed White Spruce Stand with Willow Swales	British Columbia
107	Mixed Habitat—Disturbed Bottomland	Oklahoma		
Western—Deciduous				
108	Oak—California-bay—Buckeye— Mixed Forest	California	Wetlands	
109	Wax Myrtle Forest	California	141. Shrubby Swamp and Sedge Hummocks	Connecticut
110	Maple Thicket	Utah	142. Floodplain Pond	Colorado
111	Riparian Woodland—Willow Thickets	Utah		
112 -113.	Floodplain Cottonwood Forest	Colorado	Fields and Cultivated Areas	
Western—Coniferous-Deciduous (Mixed)				
114	California-bay—Bishop Pine—Mixed Forest	California	143. Open Field	New York
115	Lodgepole Pine Forest with Aspen	Colorado	144.-145. Vineyard (I, II)	New York
116	Ponderosa Pine—Scrub Oak— Mountain Woodland	Mahogany Colorado	146. Recently Abandoned Pasture	Pennsylvania
			147. Old Field	Pennsylvania
			148. Abandoned Field	Maryland
			149. Abandoned Turf Field	Maryland
			150. Grassland	North Carolina
			151. Pasture	Tennessee
			152. Abandoned Old Field	Indiana
			153-155. Native Range (I-III)	North Dakota
			156-157. Seeded Range (I, II)	North Dakota
			158. Mixed Seeded Range/Crop	North Dakota
			159.-161. Mixed—Native Range Crop (I-III)	North Dakota
			162-163. Cropland (I, II)	North Dakota
			164. Hayland	North Dakota
Urban Habitats				
			165. Commercial and Residential	British Columbia

1. SECOND-GROWTH HARDWOOD FOREST.

— **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Morris; 41°42'25"N, 73°12'22"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 9 intermittent years. **Size:** 25 acres (roughly rectangular). **Description of Plot:** See AFN 19 590-591, 1965. **Coverage:** April 27; May 13; June 3, 7-8, 15, 17-18. Hours varied from 0445 to 2300 and totaled 20. **Census:** (territorial males followed in parentheses by males/km² and males/100 acres) Red-eyed Vireo, 9 (89, 36); Ovenbird, 7 (69, 28); Com. Yellowthroat, 7; Veery, 6 (59, 24); Rufous-sided Towhee, 4 (40, 16); Black-capped Chickadee, 3 (30, 12); Chestnut-sided Warbler, 3; Gray Catbird, 2.5; Rufed Grouse, 2; Brown Creeper, 2; Am. Robin, 2; Wood Thrush, 2; Black-and-white Warbler, 2; Blue-winged Warbler, 2; Canada Warbler, 2; Am. Redstart, 2; Brown-headed Cowbird, 2; Song Sparrow, 2; Com. Flicker, 1.5; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; White-breasted Nuthatch, 1; House Wren, 1; Cedar Waxwing, 1, N Oriole, 1; Scarlet Tanager, 1; Am. Goldfinch, 1; Broad-winged Hawk, +; Barred Owl, +; E. Kingbird, +, E. Phoebe, +; Com. Crow, +; Blue-gray Gnatcatcher, +; Rose-breasted Grosbeak, +; Cardinal, +; White-throated Sparrow, +. **Total:** 41 species; 77 territorial males (761/km², 308/100 acres). **Remarks:** Special thanks to Jim Cavanaugh for his help. — ANDREW MAGEE, Woollybear Company, Troy, N.H. 03465.

2. SUBURBAN WILDLIFE SANCTUARY — MIXED HABITAT.

— **Location:** Connecticut; Fairfield Co., Nature Center at Westport; 41°8'N, 73°22'W, Norwalk North, Conn. — N. Y. Quadrangle, USGS. **Continuity:** Established 1971; 5 consecutive years. **Size:** 20.2 ha = 50 acres (boundary very irregular owing to the attaining of property in small parcels). **Description of Plot:** See AB 25:1010-1011, 1971. **Coverage:** May 20-21, 26-28; June 3-4, 10, 14, 18, 24-25. All trips between 0600 and 1030. Total man-hours: 18. **Census:** House Wren, 14 (69, 28); Gray Catbird, 7 (35, 14); Song Sparrow, 5 (25, 10); Great Crested Flycatcher, 4 (20, 8); Blue Jay, 4; Red-winged Blackbird, 4; Cardinal, 4; Rufous-sided Towhee, 4; Mourning Dove, 3 (15, 6); Tufted Titmouse, 3; Brown Thrasher, 3; Am. Robin, 3; Field Sparrow, 3; Com. Flicker, 2; Downy Woodpecker, 2; Com. Crow, 2; Wood Thrush, 2; Starling, 2; Blue-winged Warbler, 2; N Oriole, 2; Hairy Woodpecker, 1; E. Kingbird, 1; Tree Swallow, 1; Black-capped Chickadee, 1; Com. Yellowthroat, 1; Rose-breasted Grosbeak, 1; House Finch, 1; Am. Goldfinch, 1. **Total:** 28 species; 83 territorial males (410/km²; 166/100 acres). **Remarks:** Nests located: 14 House Wren, 1 Tree Swallow, 2 Starling, 1 Downy Woodpecker, 1 Com. Crow, 1 Blue Jay, 1 N. Oriole. Two fewer species were recorded this year, but the number of territorial males continued to increase to 83 from 79 in 1974, 74 in 1973, and 69 in 1972. Wood Thrush returned after a year's absence but the Veery did not. The Am. Goldfinch was recorded as a nester for the first time. Cowbirds and indications of parasitism were not evident this year. Absent this year

but present in 1974 were the Ring-necked Pheasant, E. Wood Pewee, White-breasted Nuthatch, Brown Creeper, and House Sparrow. Common Crow and yellowthroat were additions to the list that were missed in 1974. Bluebirds, present all winter and early spring, once again did not remain despite the presence of some 20 houses on the sanctuary. The change in numbers between 1974 and 1975 was very slight. No species exhibited a drastic change. A total of 13 species showed an increase by one or two pairs, 9 dropped by one or two pairs, and 11 remained the same. — ROBERT C DEWIRE, The Nature Center at Westport, Westport, Conn. 06880.

3. RED MAPLE FOREST — Location:

New York, Chautauqua Co., Erie Lake Plain, along Chapin Road 200 yards W of Aldrich Road; 79°11'W, 42°31'N, Silver Creek Quadrangle, USGS. **Continuity:** New **Size:** 9.9 ha = 24.5 acres (rectangle, surveyed) **Description of Plot:** The nearly homogeneous overstory and understory are dominated by Red Maple (*Acer rubrum*). The shrub layer (woody plants 15 in. tall and 1 in. dbh) is dominated by Com. Greenbrier (*Smilax rotundifolia*) and S. Arrowwood (*Viburnum dentatum*). A quantitative survey of the vegetation resulted in the following: Trees = 4 in. dbh, on the basis of four 6 X 330 ft transects, 340/acre, total basal area 128 ft²/acre Species comprising 90% of the total number of trees Red Maple, 300, 88, 91, 57; Sugar Maple (*A. saccharum*), 20, 6, 5, 14. Associates are Yellow Birch (*Betula alleghaniensis*) and Black Cherry (*Prunus serotina*). Understory trees (trees = 1 in., but 4 in dbh), based on same sample areas, 260/acre; total basal area 6.7 ft²/acre. Species comprising 90% of the total number of understory trees: Red Maple, 110, 42, 58, 75, Am. Beech (*Fagus grandifolia*), 100, 38, 20, 75; Sugar Maple, 2, 8, 15, 25. Trees by diameter size class: A(4-6 in) 111, 32, 15, 7, 12; B(6-9 in) 141, 41, 43, 2, 34; C(9-15 in) 81, 24, 54, 4, 42; D(15-21 in) 10, 3, 146, 12. Shrub stems/acre 2220; canopy cover 85%, canopy height 50 ft (40-65). **Edge:** Bordered on one side by similar forest, two sides by a road and cropland, and on the remaining side by residential area, vineyard, and similar forest. **Topography:** Flat. **Elevation:** 680 ft **Weather:** Moderate, cloud cover variable. No rain on census days. **Coverage:** May 16, 22; June 6, 8, 11, 14, 15, 18, 21, 27. All trips between dawn and 0900 or 1940 and 2130 hours. Total man-hours: 21.3. **Census** Am. Redstart, 13.5 (136, 55); Ovenbird, 9 (91, 37), Veery, 8.5 (86, 35); Red-eyed Vireo, 8 (81, 33), E. Wood Pewee, 4 (40, 16); Wood Thrush, 3.5 (35, 14), House Wren, 2.5; Indigo Bunting, 2.5; Gray Catbird, 2; Rose-breasted Grosbeak, 1; Cardinal, 2; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Acadian Flycatcher, 1; Black-capped Chickadee, 1; Am. Robin, 1; Warbling Vireo, 1; N. Oriole, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Com. Flicker, 0.5 **Total:** 21 species; 67 territorial males (676/km², 273/100 acres). **Remarks:** 8 nests located: Com. Crow, 1, Robin, 2; Veery, 2; Red-eyed Vireo, 1; Ovenbird, 1, Am. Redstart, 2. Special thanks to Robert Butterworth, Jim Henriksen, Cathie Baumgartner, and Harry E Slack for their help in various phases of this study This

census was funded as part of a larger study by Niagara-Mohawk Power Corporation. — ROY S. SLACK (compiler), PAUL G. KALKA, VINCENT J. LUCID, and JOE McMULLEN, *Environmental Analysts, Inc., 333 Crossways Park Drive, Woodbury, N Y 11797.*

4. MIXED UPLAND FOREST. — **Location:** New York, Ulster Co., 1 mile SE of Mohonk Lake; 41°46'N, 74°09'W, Mohonk Lake Quadrangle, USGS. **Continuity:** New. **Size:** 142 ha = 350 acres (surveyed). **Description of Plot:** The dominant canopy trees are Red Oak (*Quercus rubra*), Chestnut Oak (*Q. prinus*), Sugar Maple (*Acer saccharum*), and White Ash (*Fraxinus americana*). Most abundant understory growth (less than 3-inches dbh): Sugar Maple, Red and Chestnut Oak, White Ash, and Flowering Dogwood (*Cornus florida*). Typical ground cover is Early Low Blueberry (*Vaccinium vacillans*) on dry sites and Virginia Creeper (*Parthenocissus quinquefolia*), among many others, on wet. A quantitative survey of the vegetation gave the following results: Trees 3 inches in diameter and over, 175/acre; total basal area, 100 ft²/acre. Species comprising 90% of the total: Red Oak, 40, 25, 23, 40; Chestnut Oak, 37, 22, 19, 40; Sugar Maple, 19, 17, 11, 25; White Ash, 10, 9, 8, 20; Red Maple (*A. rubrum*), 9, 6, 3, 10; Pitch Pine (*Pinus rigida*), 5, 3, 1, 5. Shrub stems per acre, 1400; ground cover, 35%; canopy cover, 65%; average canopy height, 50 ft (range 15-80 ft). **Edge:** Less than 10% of the watershed boundary is bordered by second growth fields which lap slightly into the watershed; the rest is bordered by similar deciduous evergreen forest. Steeply rising (600-1480 ft), SE facing, mountain stream watershed, including a 150 ft escarpment above a 50 ft talus slope and a 4-acre artificial pond. **Coverage:** April 27; May 22, 24, 26, 29-31; June 1-2, 4-5, 8, 10-11, 19-22; July 4, 20. Trips usually between 0445 and 0800 hours and occasionally at dusk. Total man-hours: 65. **Census:** Wood Thrush, 47 (33, 13); Rufous-sided Towhee, 28.5 (20, 8); E. Wood Pewee, 19 (13, 5); Black-and-white Warbler, 19; Red-winged Blackbird, 16 (11, 5); Scarlet Tanager, 15.5 (11, 4); Am Robin, 12.5 (9, 4); Red-eyed Vireo, 11.5 (8, 3); Ovenbird, 11 (8, 3); Com. Flicker, 10 (7, 3); Field Sparrow, 10; Dark-eyed Junco, 10; Indigo Bunting, 8 (6, 2); Chipping Sparrow, 8; Com. Yellowthroat, 7.5 (5, 2); Great Crested Flycatcher, 7 (5, 2); Blue Jay, 6 (4, 2); Tufted Titmouse, 6; House Wren, 6; Black-capped Chickadee, 4.5 (3, 1); E. Phoebe, 4 (3, 1); White-breasted Nuthatch, 4; Black-throated Blue Warbler, 4; Prairie Warbler, 4; Song Sparrow, 4; Com. Grackle, 3.5 (2, 1); Gray Catbird, 3 (2, 1); Brown Thrasher, 3; Yellow-throated Vireo, 3; Louisiana Waterthrush, 3; Am. Redstart, 3; Cardinal, 3; Rose-breasted Grosbeak, 3; Blue-winged Warbler, 2.5; Downy Woodpecker, 2; Yellow-rumped Warbler, 2; N. Oriole, 2; Am. Goldfinch, 2; Mourning Dove, 1.5; E. Kingbird, 1.5; Green Heron, 1; Red-tailed Hawk, 1; Am. Woodcock, 1; Belted Kingfisher, 1; Hairy Woodpecker, 1; Least Flycatcher, 1; Red-breasted Nuthatch, 1; Winter Wren, 1; Cedar Waxwing, 1; Worm-eating Warbler, 1; Yellow Warbler, 1; Hermit Thrush, 0.5; Veery, 0.5; Com. Crow, +; Swamp Sparrow, +. **To-**

tal. 55 species, 364.5 territories (257/km², 104/100 acres). **Remarks:** 35 nests were found: 11 Red-winged Blackbird; 5 robin; 3 flicker, Wood Thrush and Com Grackle; 2 of Red-eyed Vireo and towhee; 1 of woodcock, phoebe, chickadee, House Wren, catbird, junco, and Chipping Sparrow. Young found unable to fly Red-tailed Hawk, Yellow-throated Vireo, Rose-breasted Grosbeak. The census was hampered by the unusual number of rainy mornings in early June — JIM STAPLETON, *Mohonk Trust, Mohonk Lake, New Paltz, N. Y. 12561.*

5. BIRCH—MAPLE—OAK FOREST. — **Location:** Pennsylvania: Butler Co., Buffalo Township, 1 mile S of intersection of State Rte 228 and Kepple Road on Todd Sanctuary. 40°44'N, 79°42'W., Freeport Quadrangle, USGS. **Continuity:** Established 1974 **Size:** 9 ha = 22.4 acres (square, measured and grided with line and compass). **Description of Plot:** See AB 28: 992-993, 1974. **Weather:** Warm with some rain throughout period. **Coverage:** May 23-24, 31; June 1-2, 8, 13, 15, 19, 21, 29; between 0500 and 0800 Total man-hours: 25-30. **Census:** Red-eyed Vireo, 19 (211, 85); Cardinal, 10 (111, 45); Blue-gray Gnatcatcher, 5.5 (61, 25); Acadian Flycatcher, 4.5 (50, 20), Tufted Titmouse, 4.5; Wood Thrush, 4.5; Scarlet Tanager, 4.5; E. Wood Pewee, 3 (33, 13); Brown-headed Cowbird, 3; Downy Woodpecker 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Cerulean Warbler, 2; Louisiana Waterthrush, 2; Kentucky Warbler, 2; Ruffed Grouse, 1.5; Broad-winged Hawk, 1, Screech Owl, 1; Ruby-throated Hummingbird, 1, Pileated Woodpecker, 1; Hairy Woodpecker, 1, E Phoebe, 1; Am. Robin, 1; Carolina Wren, 1; Black-capped Chickadee, 1; Ovenbird, 1; Hooded Warbler, 1, Rufous-sided Towhee, 1; Yellow-billed Cuckoo, +, Barred Owl, +; Com. Flicker, +; Com. Crow, +, Cedar Waxwing, +; Indigo Bunting, +. **Total** 35 species; 84 territorial males or females (933/km², 378/100 acres). **Remarks:** Ovenbird (1) was accidentally left off last year's list. The large increase in Red-eyed Vireo from 8.5 to 19 can mostly be attributed to a more careful survey. Cardinal, Blue-gray Gnatcatcher, Wood Thrush, and Tufted Titmouse showed a slight increase. Acadian Flycatcher, and Cerulean Warblers showed a slight decrease. Barred Owl was the only new species. Nests found: Wood Thrush, 2; Red-eyed Vireo, 2, Cardinal, 2; Broad-winged Hawk, 1; Ruffed Grouse, 1, Hairy Woodpecker, 1; E. Phoebe, 1; Carolina Wren, 1, Am. Robin, 1; Rufous-sided Towhee, 1. I thank Ann-Marie Bancroft, Rupert Friday, Chuck Bier, and Frank Bell for their help and Donna Egbert for making the maps. — G. THOMAS BANCROFT, RD 3, *Cedar Run Road, Allison Park, Pa. 15101.*

6. BIRCH—TULIP-TREE FOREST. — **Location:** Pennsylvania: Lancaster Co., 3 miles W of Wakefield (Peach Bottom P.O.) on the E shore of the Susquehanna River, directly across the river from the Peach Bottom Atomic Power Station (York Co.), 39°46'26"N, 76°14'24"W, Quarryville Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 8.1 ha = 20 acres (836 X 1045 ft, tape measure and compass)

Description of Plot: See AB 28: 993, 1974. In the area affected by fire in 1974, the understory has grown up mostly in Poke (*Phytolacca americana*). Most of the larger trees survived, but lower limbs were lost to a height of 10 to 20 ft. **Weather:** Temperature data from Peters Creek weather station, 1 mile S of plot. Precipitation data from Conowingo Dam, 8 miles SSE of plot. Monthly mean high and low temperature followed in parentheses by extreme high and low (in degrees F). April, 58, 40 (69, 29); May, 77, 56 (91, 42); June, 81, 63 (95, 53). Rainfall: April, 3.11 in; May 6.64 in; June, 8.41 in. **Coverage:** April 18, 25; May 5, 9, 19, 23, 30; June 6, 13, 28; July 4. All trips between 0530 and 1020 hrs, EDT; average length of trip 2 hr, 20 min; total man-hours: 64. **Census:** Red-eyed Vireo, 10 (124, 50); Cardinal, 8.5 (105, 43); Rufous-sided Towhee, 6.5 (80, 33); Carolina Wren, 5 (62, 25); Indigo Bunting, 5; Tufted Titmouse, 4 (49, 20); Kentucky Warbler, 3.5 (43, 18); Black-capped Chickadee, 3 (37, 15); Wood Thrush, 3; White-eyed Vireo, 3; Worm-eating Warbler, 3, E. Wood Pewee, 2.5; Blue-gray Gnatcatcher, 2.5; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Bobwhite, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Acadian Flycatcher, 1; Com. Crow, 1; Cerulean Warbler, 1; Com. Yellowthroat, 1; Am. Redstart, 1; Brown-headed Cowbird, 1 (female); Scarlet Tanager, 1; Yellow-throated Vireo, 0.5; E. Phoebe, +; Yellow-breasted Chat, +. **Total:** 31 species; 77.5 territorial males or females (958/km², 388/100 acres). **Remarks:** Seven nests located: Mourning Dove, 1; E. Wood Pewee, 1; Com. Crow, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Cardinal, 2. The Carolina Wren nest was deserted owing to parasitism by the Brown-headed Cowbird. This is part of a continuing study to investigate and monitor the environmental conditions in the vicinity of the proposed Philadelphia Electric Company Fulton Generating Station. E. Terry Euston, Jesse Grantham, Paul G. Heisley and Nancy C. Magnusson assisted on several trips. — THEODORE W. GUTZKE and ROBERT M. SCHUTSKY, Ichthyological Associates, Inc., P.O. Box 12, Drumore, Pa. 17518.

7. DISTURBED UPLAND OAK FOREST. — **Location:** Pennsylvania; Lycoming Co., Williamsport Municipal Watershed, 8 miles SW of Williamsport; 41°10'N, 77°04'W; Williamsport Quadrangle, USGS. **Continuity:** New. **Size:** 10.1 ha = 25 acres (irregular, surveyed). **Description of Plot:** See AB 29: 756, 1975. **Weather:** 30-year averages in parenthesis: Mean temperature: May 61.5° (60.1°), June 66.9° (68.6°); precipitation: May 6.54 in. (3.99 in.), June 5.25 in. (3.25 in.). During counts the temperature varied from 50°F to 73° (mean 59°); skies were overcast on 5 trips. **Coverage:** May 20, 25-26, 31; June 1, 4, 21-22; July 1. Eight trips between 0545 and 0835, EDT, one from 1825 to 2030. Total man-hours: 19. **Census:** Rufous-sided Towhee, 10.5 (104, 42); Com. Yellowthroat, 6 (59, 24); Chipping Sparrow 4.5 (45, 18); House Wren, 3 (30, 12); Indigo Bunting, 3; Brown-headed Cowbird, 2 (females); Field Sparrow, 2; Black-and-white Warbler, 1.5; Ruby-throated Hummingbird, 1 (female); Com. Flicker, 1; Great Crested Flycatcher, 1; Black-capped



Census 7. Disturbed Upland Oak Forest. Photo/C.E. Schwarz.

Chickadee, 1; E. Wood Pewee, 0.5; Brown Thrasher, 0.5; N. Oriole, 0.5; Cardinal, 0.5; Red-tailed Hawk, +, Ruffed Grouse, + (female); Com. Raven, +; Blue-gray Gnatcatcher, +; Red-eyed Vireo, +. **Total:** 24 species, 41.5 territorial males or females (410/km², 166/100 acres). **Remarks:** Disturbed soil on the 1.5 acre loading area was seeded with a mixture of Tall Fescue and Birdsfoot Trefoil during the census period. Appreciation is extended to the Williamsport Municipal Water Authority for permission to conduct the study on the Watershed. — CHARLES E. SCHWARZ, 1405 Pine Crest Dr., South Williamsport, Pa. 17701.

8. ELM—CHERRY FOREST. — **Location:** Pennsylvania; Washington Co., 4 miles SSW of Finleyville in Mingo Creek Co. Park; 40°11'46"N, 80°02'03"W, Hackett Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 330 X 1980 ft, measured laterally and longitudinally with surveyor's chain). **Description of Plot:** The dominant canopy trees are Slippery Elm (*Ulmus rubra*) and Black Cherry (*Prunus serotina*). Most prominent in the understory are Com. Spicebush (*Lindera benzoin*) and saplings of the canopy trees. The ground cover is primarily Pale Jewelweed (*Impatiens pallida*), Sweet Cicely (*Osmorhiza claytonii*), May-apple (*Podophyllum peltatum*), and Violets (*Viola* sp.). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 271/acre; total basal area 161.0 ft²/acre. Species comprising 90% of the total number of trees: Slippery Elm, 62, 23, 29, 100; Black Cherry, 37, 14, 17, 100; dead trees, 32, 12, 7, 100; Flowering Dogwood (*Cornus florida*), 23, 9, 1, 83; Black Oak (*Quercus velutina*), 20, 7, 17, 67, Sugar Maple (*Acer saccharum*), 18, 7, 2, 83, Hornbeam (*Ostrya virginiana*), 17, 6, 1, 50; Am Basswood (*Tilia americana*), 15, 6, 13, 33; Bitternut Hickory (*Carya cordiformis*), 8, 3, 4, 67; Red Maple (*A. rubrum*), 8, 3, 2, 50. Trees by diameter size class A (3-6 in.) 85, 31, 9, 5; B (6-9 in.) 65, 24, 20, 12; C (9-15 in.) 92, 34, 73, 46; D (15-21 in.) 22, 8, 39, 24; E (21-27 in.) 7, 2, 21, 13. Shrub stems/acre 6,425, ground cover 58%; canopy cover 81%; average canopy height 90 ft (range 81-102). **Edge:** Bordered by similar habitat on all sides except SE end where the forest

continues for approximately 60 ft and then is bordered longitudinally 300 ft by an overgrown field. **Topography:** 15° NW facing slope. **Elevation:** 1020-1100 ft. **Weather:** Warm, usually partly cloudy; rain during two trips. **Coverage:** May 18-19, 28, 31; June 4, 10, 16-19; 4 trips between 0530 and 0950, 1 between 1250 and 1410, 8 between 1730 and 2030, EDT. Total party-hours: 21. **Census:** Cerulean Warbler, 11 (181, 73); Acadian Flycatcher, 10.5 (173, 70); Red-eyed Vireo, 7 (115, 47); Wood Thrush, 6 (99, 40); Rufous-sided Towhee, 4.5 (74, 30); Cardinal, 4 (66, 27); House Wren, 3 (49, 20); Kentucky Warbler, 3; Hooded Warbler, 2.5; Gray Catbird, 2; Scarlet Tanager, 2; Indigo Bunting, 2; Am. Redstart, 1.5; E. Wood Pewee, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Brown Creeper, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Brown-headed Cowbird, 1 (female); White-breasted Nuthatch, 0.5; Am. Robin, 0.5; Red-tailed Hawk, +; Chimney Swift, +; Com. Flicker, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Com. Grackle, +. **Total:** 32 species; 67 territorial males or females (1104/km², 447/100 acres). **Remarks:** Two nests were located: Acadian Flycatcher and Blue-gray Gnatcatcher. The maximum number of female Brown-headed Cowbirds seen on any trip was 1. Thanks to Thelma Boyd, Eileen Higbee, Saundra King, Martha Kulp, and Thelma Wiegel, who accompanied us on several trips. Special thanks to Glen Phillips for his invaluable advice and assistance. — ROGER V. and MARGARET A. HIGBEE, 3486 Boyd Avenue, Finleyville, Pa. 15332.

9. MOUNTAIN TOP, OAK—MAPLE FOREST.

— **Location:** Pennsylvania; Westmoreland Co., 10 miles SSW of Ligonier, 6 miles S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; 40°07'37"N, 79°10'50"W, Ligonier Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 6.07 ha = 15 acres (rectangular, 300 X 1980 ft, measured). **Description of Plot:** See AB 28: 993, 1974. A major physical change is two openings cut in the forest, each measuring approximately 300 ft X 150 ft; one on either side of the study area but not opposite each other. **Weather:** Windy, rain and cold for 2 days; warm and clear for 2 days. **Coverage:** June 7-8, 14-15. Hours: 0500 to 0930, 1200 to 1300, and 1700 to 1930. Total party-hours: 17.5. **Census:** Red-eyed Vireo, 5 (82, 33); Ovenbird, 4 (66, 27); Rufous-sided Towhee, 3.5 (58, 23); Dark-eyed Junco, 3 (49, 20); Wood Thrush, 2; Chipping Sparrow, 2; E. Wood Pewee, 1.5; Brown Creeper, 1.5; Scarlet Tanager, 1.5; Veery, 1; Solitary Vireo, 1; Black-throated Green Warbler, 1; Rose-breasted Grosbeak, 1; Blue Jay, 0.5; White-breasted Nuthatch, 0.5; Com. Yellowthroat, 0.5; Hairy Woodpecker, +; Great Crested Flycatcher, +; Com. Grackle, +. **Total:** 19 species; 29.5 territorial males (486/km², 197/100 acres). — R. CARRELL ABBOTT, Audubon Society of Western Pennsylvania, Carnegie Museum, Pittsburgh, Pa. 15213.

10. SECOND GROWTH HARDWOOD FOREST.

— **Location:** Pennsylvania; Perry Co., in F. J. Reinerman Wildlife Sanctuary, Green Valley, 14 km NW

Carlisle, 40°17'00"N, 77°17'30"W, Landisburg Quadrangle, USGS. **Continuity:** Established 1972; 3 intermittent years. **Size:** 31.5 ha = 77.8 acres (trapezoidal, 600 X 770 X 300 X 700 m, paced). **Description of Plot:** See AB 26: 958, 1972. **Weather:** About Average; warm to mild temperatures with some shower activity. **Coverage:** May 29; June 1, 3, 7-9, 20, 24, 26, July 1; between 0540 and 0820. Total man-hours 40.5 **Census:** Red-eyed Vireo, 11.5 (37, 15); Indigo Bunting, 6.5 (21, 8); Tufted Titmouse, 6 (19, 8); Blue-gray Gnatcatcher, 4 (13, 5); Cardinal, 3.5 (11, 4); Acadian Flycatcher, 3 (10, 4); Yellow-billed Cuckoo, 2.5; Great Crested Flycatcher, 2; Louisiana Waterthrush, 2; Brown-headed Cowbird, 2; Scarlet Tanager, 2; Downy Woodpecker, 1; E. Wood Pewee, 1; Blue Jay, 1; Black-capped Chickadee, 1; Am. Redstart, 1; Com. Grackle, 1; Com. Crow, 0.5; Turkey, +; Wood Thrush, +. **Total:** 20 species; 52 territorial males or females (165/km², 67/100 acres). **Remarks:** Two nests located Cardinal and Louisiana Waterthrush. There was a decrease in individuals of five species of hole-nesters, with an increase in only one, the titmouse. Other species changed only moderately as would normally be expected. The species total continues for the third year to be 20, with the number of territorial birds almost precisely between the previous two censuses. Thanks to Carter T. Atkinson, Joseph Hulihan, Roger Lowe, Carol P. Ralph, Jean C. Raymond and Malcolm M Simons who helped on the censuses. C. P. Ralph and M. M. Simons assisted in the interpretation of territory maps. — C. JOHN RALPH, Dept. of Biology, Dickinson College, Carlisle, Pa. 17013.

11. OAK—TULIP-TREE—BEECH FOREST.

— **Location:** West Virginia; Kanawha Co., 8 miles S of Charleston in the Kanawha State Forest. The centerline starts at 38°14'15"N, 81°39'16"W, Racine Quadrangle, USGS, and extends SW. **Continuity:** Established 1966; 3 intermittent years (formerly called Mature Hardwood Forest). **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** See AB 24: 745, 1970. Dominant in the canopy trees are oaks (*Quercus* sp.), Tulip-tree (*Liriodendron tulipifera*), and Am. Beech (*Fagus grandifolia*). The understory consists mostly of saplings of the canopy trees although Wild Hydrangea (*Hydrangea arborescens*) is quite prominent. The ground cover is varied but includes Christmas Fern (*Polystichum acrostichoides*), Poison Ivy (*Rhus radicans*), and Wood Nettle (*Laportea canadensis*). The forest was timbered about 1930 leaving the large cull beech and other species. These trees were girdled during a forest improvement program started in 1950. These dead and dying trees dominated the plot in 1966 but are no longer standing. Two years ago a windstorm uprooted a 48 in. Tulip-tree and two 24 in. Red Oaks that fell across the centerline path. The results of a quantitative vegetation survey of 6 0.1 acre samples are: Trees 3-inches diameter and over 265/acre, total basal area 116.8 sq. ft/acre. Species comprising 90% of the total number of trees: White Oak (*Q. alba*), 38, 14, 15, 67; Red Oak (*Q. rubra*), 10, 4, 8, 50; Black Oak (*Q. velutina*), 8, 3, 10, 33; Scarlet Oak (*Q. coccinea*), 3, 1, 2, 17; Tulip-tree, 38, 14, 22, 50, Am

Beech, 40, 15, 10, 67; Black Gum (*Nyssa sylvatica*), 15, 6, 8, 83; Cucumber Tree (*Magnolia acuminata*), 10, 4, 4, 50; White Ash (*Fraxinus americana*), 8, 3, 4, 17, Pignut Hickory (*Carya glabra*), 18, 7, 3, 67; Sourwood (*Oxydendron arboreum*), 13, 5, 3, 50; Red Maple (*Acer rubrum*), 17, 6, 2, 100; Flowering Dogwood (*Cornus florida*), 17, 6, 1, 67; dead trees 5, 2, 5, 50. Trees by diameter size class: A (3-6 in.) 140, 53, 14, 12, B (6-9) 53, 20, 16, 14; C (9-15) 50, 19, 41.3, 35; D (15-21) 17, 6, 30, 26; E (21-27) 5, 2, 15.5, 13. Shrub stems/acre 3800; ground cover 38%; canopy cover 75%; average canopy height 88 ft (range 83-101). **Edge:** The forest continues on all sides. **Topography:** The plot starts 100 yards from Davis Creek at 1080 ft and extends up the ravine formed by Pigeon Roost Run to 1100 ft. The centerline stays within 50 ft of the stream. The hillsides slope from 20% to 50%. **Weather:** Cloudy and pleasantly warm with no wind. Rain about 0500 two mornings delayed but did not otherwise hinder census. Light fog the other two mornings. **Coverage:** May 23-26; 10 trips between daylight and 0830 and 2 in the late morning. Total party-hours: 10. **Census:** Acadian Flycatcher, 15 (247, 100); Am. Redstart, 12 (198, 80); Red-eyed Vireo, 6 (99, 40); Ovenbird, 4 (66, 27); Cerulean Warbler, 3 (49, 20); Hooded Warbler, 3; Wood Thrush, 2.5; Worm-eating Warbler, 2; Tufted Titmouse, 1.5; Blue-gray Gnatcatcher, 1.5; E. Wood Pewee, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 0.5; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Cardinal, +. **Total:** 25 species; 61 territorial males (1005/km², 407/100 acres). **Remarks:** The plot still supports a high nesting population. In nine years the trees have grown up too high for the brush birds. Towhees and chats are absent and there are fewer Carolina Wrens and Kentucky Warblers. The dead trees have fallen and the then surprisingly small woodpecker population is even smaller. — WILLIAM SMITH, MIKE WILLIAMS, NEVADA LAITSCH, MAXINE THACKER, ANN PYLE, GRACE GRANT, GEORGE KOCH (compiler), *Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.*

12. MATURE NORTHERN HARDWOODS. — **Location:** West Virginia; Brooke Co., Weimer Nature Trails of Bethany College, Bethany, 40°12'45" N; 80°35'55" to 80°33'45" W; Bethany Quadrangle, USGS. **Continuity:** Established 1971; 3 intermittent years. **Size:** 12.2 ha = 30 acres (square). **Description of Plot:** See AB 25: 972-973, 1971. **Coverage:** April 4, 9, 11, 16, 18, 21, 29; May 5, 7-9, 14, 19; June 3, 5, 9-10, 17 trips between 0510 and 2000 hrs. Total party-hours 21.5. **Census:** Acadian Flycatcher, 14 (115, 47); Blue-gray Gnatcatcher, 8 (66, 27); Red-eyed Vireo, 7 (58, 23); Cerulean Warbler, 7; Tufted Titmouse, 5 (41, 17); Cardinal, 5; Rufous-sided Towhee, 4 (33, 13); E. Wood Pewee, 3.5 (29, 12); Downy Woodpecker, 3 (25, 10); Carolina Chickadee, 3; Wood Thrush, 3; Carolina Wren, 2; Kentucky Warbler, 2; Great Crested Flycatcher, 1.5; House Wren, 1.5; Com. Flicker, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; White-breasted Nuthatch, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Indigo Bunting, 1; Hairy Wood-

pecker, 0.5; Am. Robin, 0.5; Cooper's Hawk, +; Rufed Grouse, +; Yellow-billed Cuckoo, +; Chimney Swift, +; Ruby-throated Hummingbird, +; E. Phoebe, +; Com. Crow, +; Com. Grackle, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 34 species, 77.5 territorial males (638/km², 258/100 acres). **Remarks:** Nest found: Ruffed Grouse, 1. — KEN VOORHIS and A. R. BUCKELOW, JR. (compiler), *Biology Dept., Bethany College, Bethany, W. Va. 26032*

13. OAK—BEECH—TULIP-TREE FOREST. — **Location:** West Virginia; Kanawha Co., 3.5 miles S of South Charleston; center line starts at 38°19'08" N, 81°41'42" W and extends S curving to the E, Charleston West Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Description of Plot:** See AB 28: 995-996, 1974. **Size:** 6.07 ha = 15 acres (rectangular 110 x 660 yards, measured longitudinally and estimated laterally). **Weather:** Generally clear and calm, but unseasonably hot and humid. Some rain fell during the nights. **Coverage:** May 19-20, 23-24, 26, 28; June 9. Most trips between 0615 and 0900, with samples in mid-morning and late afternoon. Total man-hours 18. **Census:** Red-eyed Vireo, 7 (115, 47); Ovenbird, 6 (99, 40); Tufted Titmouse, 4 (66, 27); Cerulean Warbler, 4; Acadian Flycatcher, 3 (49, 20); Kentucky Warbler, 3; Wood Thrush, 2.5; Hooded Warbler, 2.5; Rufous-sided Towhee, 2.5; Carolina Wren, 2; Blue-gray Gnatcatcher, 2; Black-and-white Warbler, 2; Yellow-throated Vireo, 1.5; Worm-eating Warbler, 1.5; Am. Redstart, 1.5; Cardinal, 1.5; Downy Woodpecker, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Scarlet Tanager, 1; E. Wood Pewee, 0.5; White-eyed Vireo, 0.5; Yellow-throated Warbler, 0.5; Red-shouldered Hawk, +; Yellow-billed Cuckoo, +; Chimney Swift, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Louisiana Waterthrush, +; Brown-headed Cowbird, +; Summer Tanager, +; Indigo Bunting, +. **Total:** 35 species; 50.5 territorial males (832/km², 337/100 acres). **Remarks:** No man-made changes took place on the area, but a second consecutive mild winter followed by a very wet spring contributed to the greatly increased thickening of the understory, erasing rapidly the scars of the old fires. Grasses and poison ivy are obliterating the wheel tracks in the road, now that it is in complete disuse save for an occasional cycle. Edge-loving species are declining. The heavy concentration both in species and individuals has always been clustered around the old dump opening. Thanks to George Koch for assistance with the evaluation. — CONSTANCE R. KATHOLI, *Brooks Bird Club, 930 Woodland Avenue, South Charleston, W. Va. 25303.*

14. OAK—MAPLE—HICKORY FOREST. — **Location:** West Virginia; Raleigh Co., top of White Oak Mountain, N of W. Va. Rte. 3 between Shady Spring and Jumping Branch. The centerline starts at 37°40'54" N, 81°01'41" W, Shady Spring Quadrangle, USGS, and extends N. **Continuity:** New. **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** The dominant canopy trees are Oak (*Quercus*

sp.) Most prominent in the understory are Dogwood (*Cornus florida*), and saplings of the canopy trees. The ground cover is primarily Blue Cohosh (*Caulophyllum thalictroides*), Heart-leaved Skullcap (*Scutellaria incana*) and New York Fern (*Thelypteris noveboracensis*). From a quantitative vegetation survey of six 0.1 acre circular samples: Trees 3-inches diameter and over, 361/acre; total basal area 119 ft²/acre. Species comprising 88% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): Chestnut Oak (*Q. prinus*), 42, 11, 7.4, 83; Black Oak (*Q. velutina*), 35, 9, 16.4, 83; Red Oak (*Q. rubra*), 20, 5, 7.4, 83; White Oak (*Q. alba*), 12, 3, 5.7, 67; Red Maple (*Acer rubrum*), 50, 14, 9.5, 100; Sugar Maple (*A. saccharum*), 10, 3, 1.4, 50; Mockernut Hickory (*Carya tomentosa*), 33, 9, 15, 67; Ignut Hickory (*C. glabra*), 27, 7, 9.7, 67; dead trees, 47, 13, 5.5, 100; Tulip-tree (*Liriodendron tulipifera*), 28, 8, 8.3, 50; White Ash (*Fraxinus americana*), 15, 4, 3.5, 67; Sour Gum (*Nyssa sylvatica*), 8, 2, 3.6, 33. Trees by diameter size class (number of trees/acre, relative density, basal area in ft²/acre, relative dominance): A (3-6 in.) 205, 55, 20.5, 17, B (6-9 in.) 100, 27, 30, 25; C (9-15 in.) 48, 13, 38, 6, 33; D (15-21 in.) 17, 5, 30, 25. Shrub stems/acre 6567, ground cover 52%; canopy cover 91%; average canopy height 78 ft (range 69-87). **Edge:** Forest continues on all sides. **Topography:** Fairly flat old road bed, following the top of the mountain ridge. **Elevation:** 3040 ft. **Weather:** Clear with seasonable temperatures. **Coverage:** June 2-4; 6 trips between daylight and 0700, 2 trips between 1000 and 1100, and 4 trips in the evening. Total party-hours: 11. **Census:** Red-eyed Vireo, 9 (148, 60); Ovenbird, 2.5; Black-and-white Warbler, 2; Great Crested Flycatcher, 1; Carolina Chickadee, 1; Yellow-throated Vireo, 1; Solitary Vireo, 1; Cerulean Warbler, 1; Hooded Warbler, 1; Scarlet Tanager, 1; Indigo Bunting, 1; Red-tailed Hawk, +; Barred Owl, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Com. Crow, +; Tufted Titmouse, +; Brown-headed Cowbird, +. **Total:** 18 species; 21 territorial males (346/km², 143/100 acres). **Remarks:** Members of the Brooks Bird Club, who did the vegetative survey deserve special mention and thanks: Glen Phillips, Maxine Thacker, Mike Breiding and Greg Eddy. — ESTHER REICHELDERFER and ANNE EDDY (compiler), *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

tripetala). The ground cover is primarily blueberry (*Vaccinium* sp.) and greenbrier (*Smilax* sp.). A quantitative survey of the vegetation gave the following results. Trees 3-inches in diameter and over, based on six circular samples, 437/acre; total basal area 114.3 ft²/acre. Species comprising 90% of the total number of trees: White Oak, 86, 20, 23, 100; Red Oak, 33, 8, 16, 100; Chestnut Oak, 47, 11, 7, 67; Red Maple, 62, 14, 11, 100; Black Locust (*Robinia pseudo-acacia*), 12, 2, 6, 67; dead trees, 52, 12, 9, 83. Trees by diameter size class: A (3-6 in.) 279, 64, 28, 25; B (6-9 in.) 100, 23, 30, 26; C (9-15 in.) 45, 10, 33, 28; D (15-21 in.) 13, 3, 24, 21. Shrub stems/acre 4168, ground cover 29%; canopy cover 92%; average canopy height 68 ft (range 55-77). **Edge:** Bordered on all sides by similar habitat. **Topography:** A broad mountain ridge. **Elevation:** 2400-2320 ft. **Weather:** First part of the week was rainy and foggy; latter part clear and dry. **Coverage:** May 31 to June 6. Thirteen trips between dawn and 0800 hours: 2 trips at dusk. Total party-hours: 12. **Census:** Ovenbird, 8 (132, 53); Red-eyed Vireo, 5 (82, 33); Great Crested Flycatcher, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Solitary Vireo, 1; Black-and-white Warbler, 1; Hairy Woodpecker, 0.5, Wood Thrush, 0.5; Blue-gray Gnatcatcher, 0.5; Scarlet Tanager, 0.5; Barred Owl, +; Chimney Swift, +; Blue Jay, +; Com. Crow, +; Hooded Warbler, +; Brown-headed Cowbird, +. **Total:** 18 species; 21 territorial males (346/km², 140/100 acres). **Remarks:** This study was made with the cooperation of West Virginia State Park personnel and was used for demonstration and instruction purposes. One Red-eyed Vireo nest was found. It was particularly interesting to note the absence of "edge" birds in the unbroken woodland. The almost complete absence of Wood Thrushes was also noticeable — KYLE BUSH, ESTHER REICHELDERFER, EDNA GREGG, VIRGINIA JOHNSON, JOSEPH IMBROGNO, CAROLYN RUDDLE, SUE EDMONDS, WM. AND EILEEN HIGBE, ROBERT HOGAN, EDWARD ILGENFRITZ, JUANITA DeLANCEY AND GLEN PHILLIPS (compiler), *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

16. UPLAND OAK—HICKORY FOREST. — **Location:** West Virginia; Kanawha Co., 9 miles S of Charleston in the Kanawha State Forest. The centerline starts at 38°13'36"N, 81°38'43"W, Racine Quadrangle, USGS, and extends W. **Continuity:** Established 1966, 2 intermittent years. **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** See AFN 20' 613, 1966. The dominant canopy trees are oak (*Quercus* sp.) and hickory (*Carya* sp.). The understory consists of saplings of the canopy trees and a few Wild Hydrangea (*Hydrangea arborescens*) and Blueberries (*Vaccinium vacillans* and *angustifolium*). Greenbriers (*Smilax* sp.) are quite prominent in both the understory and ground cover is primarily Christmas Fern (*Polystichum acrostichoides*). A number of grape vines (*Vitis* sp.) add to the denseness if not to the canopy. The results of a quantitative vegetation survey based on six 0.1 acre samples are: Trees 3-inches in diameter and over 264/acre; total basal area 115.8 ft²/acre. Species comprising 90% of the total number of trees (figures give number of trees/acre, relative density (%), relative

dominance (%), and frequency (%), in that sequence) Chestnut Oak (*Q. prinus*), 67, 25, 26, 83; White Oak (*Q. alba*), 13, 5, 11, 50; Red Oak (*Q. rubra*) 7, 3, 12, 50, Pignut Hickory (*C. glabra*) 18, 7, 13, 50; Mockernut Hickory (*C. tomentosa*) 3, 1, 1, 33; *Sassafras albidum* 27, 10, 6, 67; Tulip-tree (*Liriodendron tulipifera*) 3, 1, 5, 33; Flowering Dogwood (*Cornus florida*) 37, 14, 4, 67; White Basswood (*Tilia heterophylla*) 10, 4, 3, 17; Red Maple (*Acer rubrum*) 20, 4, 5, 50; Sourwood (*Oxydendrum arboreum*) 23, 9, 2, 67; dead trees 12, 4, 5, 50. Trees by diameter size class (figures are for numbers of trees/acre, density, square feet of base area/acre, and dominance in that sequence): A (3-6 in.) 173, 66, 17.3, 15; B (6-9 in.) 37, 14, 11.5, 10; C (9-15 in.) 25, 9, 20, 17; D (15-21 in.) 18, 7, 33, 29; E (21-27 in.) 8, 3, 25.8, 22; F (27-33 in.) 2, 1, 8.2, 7. Shrub stems/acre 3920; ground cover 35%; canopy cover 74%; average canopy height 69 ft (range 58-79). **Edge:** The forest continues in all directions. **Topography:** The centerline follows a jeep trail, level at elevation 1380 ft, along a steep (30° slope) hillside until the trail crosses the down sloping ridge. The centerline follows the narrow ridge (50 ft level across, rolling to a steep slope) at elevation 1360 ft for the last 125 yards. **Weather:** Warm and dry. **Coverage:** May 19, 24-26. Eleven trips between daylight and 0830 and two trips in late afternoon. Total man-hours: 15. **Census:** Cerulean Warbler, 11 (181, 73); Am. Redstart, 10 (165, 67); Hooded Warbler, 6 (99, 40); Red-eyed Vireo, 5 (82, 33); Black-and-white Warbler, 4 (66, 27); Blue-gray Gnatcatcher, 3 (49, 20); Acadian Flycatcher, 2; Tufted Titmouse, 2; Wood Thrush, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Cardinal, 2; Ruffed Grouse, 1; Downy Woodpecker, 1; E. Wood Pewee, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Worm-eating Warbler, 1; Scarlet Tanager, 1; Summer Tanager, 1; Rufous-sided Towhee, 1; Ruby-throated Hummingbird, +; Great Crested Flycatcher, +. **Total:** 23 species; 60 territorial males (988/km², 400/100 acres). **Remarks:** The plot was last timbered about 1930 and has remained undisturbed since. There has been no appreciable change in populations compared to the 1966 census. Special thanks to George Koch for the vegetational survey and description. — NEVADA LAITSCH (compiler) and MAXINE THACKER Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

17. YOUNG OAK FOREST — **Location:** West Virginia; Raleigh Co., grounds of Woodrow Wilson High School, Beckley. The centerline starts at 37°48'05"N, 81°09'35"W, Beckley Quadrangle, USGS, and extends NE. **Continuity:** New. **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot** The dominant canopy trees are Oak (*Quercus* sp.) Most prominent in the understory are Dogwood (*Cornus florida*), Sourwood (*Oxydendrum arboreum*), and saplings of the canopy trees. The ground cover is primarily Teaberry (*Gaultheria procumbens*), Cinquefoil (*Potentilla simplex*), and Dewberry (*Rubus* sp.). From a quantitative vegetation survey of six 0.1 acre circular samples: Trees 3-inches diameter and over, 303/acre; total basal area 74.6 ft²/acre. Species comprising 96% of the total number of trees (figures after

each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): White Oak (*Q. alba*), 123, 41, 33, 100; Black Oak (*Q. velutina*), 35, 12, 11, 100; Red Oak (*Q. rubra*), 27, 9, 19, 83; Scarlet Oak (*Q. coccinea*), 15, 4, 14, 67; dead trees, 66, 21, 11, 100; Sourwood, 27, 9, 8, 100. Trees by diameter size class (number of trees/acre, relative density, basal area in ft²/acre, relative dominance) A (3-6 in.) 192, 61, 19.2, 16; B (6-9 in.) 97, 31, 29, 38, C (9-15 in.) 18, 5, 14.7, 20; D (15-21 in.) 7, 2, 12, 16 Shrub stems/acre 10,491; ground cover 46%; canopy cover 74%; average canopy height 69 ft (range 50-84) **Edge:** Forest continues on all sides. **Topography:** Flat area following a nature trail on the grounds of the high school. Shallow ravines run along but not on the area **Elevation:** 2360 ft. **Weather:** Clear with dew every morning and light fog one morning. **Coverage:** June 1-3; 8 trips between daylight and 0800; 4 in the evening. Total party-hours: 10. **Census:** Ovenbird, 3 (49, 20); Wood Thrush, 2.5; Rufous-sided Towhee, 2.5; Great Crested Flycatcher, 1; Tufted Titmouse, 1; Black-and-white Warbler, 1; Hooded Warbler, 1; Scarlet Tanager, 1; Cardinal, 1; Yellow-billed Cuckoo, +; Screech Owl, +; Blue Jay, +; Com. Crow, +; Carolina Chickadee, +. **Total:** 14 species; 14 territorial males (231/km², 93/100 acres). **Remarks:** This study may have been conducted too early to give an accurate quantitative survey of the breeding population. Several species appeared to be still setting up breeding territories. Special thanks to George Koch and Glen Phillips for their aid. — WILLIAM SMITH and GREG EDDY (compiler), 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; 12 consecutive years **Size** Approximately 16.2 ha = 40 acres (rectangular, 250 x 800 yards, paced). **Description of Plot:** See AFN 19 623-624, 1965. **Coverage:** May 27, 29; June 3, 5, 10, 17, 19, 24; from 0530 to 0645. Total man-hours 53 **Census:** Tufted Titmouse, 3 (19, 8); House Wren, 3; Wood Thrush, 3; Starling, 3; Com. Flicker 2; Blue Jay, 2; Gray Catbird, 2; Veery, 2; Blue-winged Warbler, 2; Ovenbird, 2; Com. Yellowthroat, 2; Cardinal, 2; Canada Goose, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Tree Swallow, 1; Black-capped Chickadee, 1; Brown Creeper, 1; E. Bluebird, 1; Yellow-throated Vireo, 1; Red-eyed Vireo, 1; Louisiana Waterthrush, 1; Red-winged Blackbird, 1; Scarlet Tanager, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1; Song Sparrow, 1. **Total:** 27 species; 43 territorial males (266/km², 108/100 acres). JOHN BROTHERTON, Fyke Nature Association, 249 E. Crescent Ave., Mahwah, N J 07430.

19. UPLAND TULIP-TREE—MAPLE—OAK FOREST. — **Location:** Maryland; Howard Co., west edge of Middle Patuxent River Valley, SW of Hobbits Glen Golf Course at Columbia; 39°12'55"N, 76°54'40"W, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; five consecutive years **Size** 11.98 ha = 29.6 acres (basically rectangular, 1125 ft

N-S by 1200 ft E-W). **Description of Plot.** See *AB* 25 971, 1971, and *AB* 26:665, 1972. Plot is part of a 68-acre upland woods, connected by forested floodplain (see census no. 22) to more extensive tracts of upland woods; total contiguous woods, 1.1 mi². **Coverage:** May 23, 29, 30; June 2, 16, 20, 25; July 2. All 8 trips in early morning, 6 of them starting within 15 minutes of sunrise. Total man-hours: 17. **Census:** Red-eyed Vireo, 12.5 (104, 42); Acadian Flycatcher, 10 (83, 34); Cardinal, 9 (75, 30); Wood Thrush, 8 (67, 27); Veery, 7 (58, 24); Kentucky Warbler, 5 (42, 17); Carolina Wren, 3.5 (29, 12); Gray Catbird, 3.5; Hooded Warbler, 3.5; Carolina Chickadee, 3 (25, 10); Tufted Titmouse, 3; Scarlet Tanager, 3; Downy Woodpecker, 2.5; Blue-gray Gnatcatcher, 2.5; Rufous-sided Towhee, 2.5; Red-bellied Woodpecker, 2; N. Parula Warbler, 2; Blue Jay, 1.5; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Cerulean Warbler, 1; Brown-headed Cowbird, 1; Mourning Dove, 0.5; Ruby-throated Hummingbird, 0.5; Hairy Woodpecker, 0.5; Louisiana Waterthrush, 0.5; Barred Owl, +; Pileated Woodpecker, +; White-breasted Nuthatch, +; Blue-winged Warbler, +. **Total:** 30 species; 90 territorial males (751/km², 304/100 acres). **Remarks:** The Veery continued its steady increase, reaching a high of 7 territories; at the same time, the Wood Thrush has maintained its high population, with 8 territories this year. The Carolina Wren reached a new high of 3.5; and the Kentucky Warbler, which dropped sharply in the adjacent floodplain plot, reached a new high of 5 territories in this upland plot. For the first time, Yellow-billed Cuckoos did not remain to nest, although transients were present as late as June 25. — CHANDLER S. ROBBINS, *Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, Md. 20811.*

20. UPLAND MIXED FOREST WITH SMALL CREEK. — **Location:** Maryland; Prince Georges Co., Beltsville; 39°01'N, 76°50'04"W, Laurel Quadrangle, USGS. **Continuity:** New. **Size:** 21 acres (3 x 3 ha grid with northeastern diagonal ½ ha deleted). **Description of Plot:** The land now occupied by this forest was apparently withdrawn from cultivation early in the century. A vegetational map of the plot was constructed from aerial photographs and on-site analysis (Fig. 1). The commonest successional sequence in the entire tract involved a large percentage of Shrub and Loblolly Pines (*Pinus virginiana*, *P. taeda*), which are now mature. Within the plot itself, relatively few pines are still standing (about 10% of the mature trees). The dominant species in the upland forest are White Oak (*Quercus alba*) and Black Oak (*Q. velutina*). The understory layer is comprised of some saplings of these species, and of Flowering Dogwood (*Cornus florida*), but Black Gum (*Nyssa sylvatica*) and Red Maple (*Acer rubrum*) are the dominant species. A third layer is composed of a profusion of ericaceous plants including *Gaylussacia*, *Lyonia* and *Vaccinium* spp. Ground cover plants are sparse, but include such species as Moccasin-flower (*Cypripedium acaule*), Indian Cucumber-root (*Medeola virginiana*), Partridge-berry (*Mitchella repens*), and *Lycopodium obscurum*. The majority of the forest floor is covered with oak leaves and a deep humus layer. The

lower portions of the plot apparently receive additional soil moisture. As a result, a strip of vegetation on both sides of the creek differs considerably in structure from the upland portions. The overstory in this wetter area consists mostly of Red Maple and Black Gum. The shrub layer consists of patches (Fig. 1) of densely packed Common Greenbrier (*Smilax rotundifolia*), Spicebush (*Lindera benzoin*), White Alder (*Clethra alnifolia*), and highbush blueberries (*Vaccinium* spp.) with large patches of Lady Fern (*Athyrium filix-femina*) and Cinnamon Fern (*Osmunda cinnamomea*). The canopy layer of both upland and lowland forest was estimated to be from 40 to 90 ft, and to be 85% closed. The understory canopy layer was from 10 to 30 ft, but occupied only an estimated 30% of the vertical space.

Topography: Traversed by a small but continuously flowing stream (Beaver Dam Creek), 2-3 ft in width, at an elevation of about 120 ft. Slopes gradually upward to about 135 ft on each side. **Local Biogeography** The plot is located in the east central portion of a large woodland tract of about 400 acres which surrounds the headwaters of Beaver Dam Creek. This tract is connected by corridors of forest to other large acreages of forest to the west, north, and south. The total semicontinuously wooded acreage of which this tract is a part exceeds 10,000 acres. **Coverage:** May 18, 20, 22, 27, 30; June 8, 10, 14, 16, 20, 22. Total observer-hours, 21, including 3 evening visits. **Census:** Ovenbird, 24 (282, 114); Red-eyed Vireo, 9 (106, 43); Wood Thrush, 5 (59, 24); Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Tufted Titmouse, 2; Black-and-white Warbler, 2; Pine Warbler, 2; Scarlet Tanager, 2; Rufous-sided Towhee, 2; Acadian Flycatcher, 1.5; E. Wood Pewee, 1.5; Carolina Chickadee, 1.5; Carolina Wren, 1.5; Hooded Warbler, 1.5; Cardinal, 1.5; Mourning Dove, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Brown Thrasher, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1; Brown-headed Cowbird, 1; Louisiana Waterthrush, 0.5; Turkey Vulture, +; Red-tailed Hawk, +; Am. Woodcock, +; Screech Owl, +; Whip-poor-will, +; Hairy Woodpecker, +; Downy Woodpecker, +; White-breasted Nuthatch, +; Gray Catbird, +. **Total:** 35 species; 70.5 territorial males (830/km², 336/100 acres). **Remarks:** This census was undertaken in conjunction with a larger project generated by interest in the bird populations of a 35-acre tract connected to the 400-acre Beaver Dam Creek tract by a narrow, disturbed corridor. The tract is not homogeneous, but extensive homogeneity is not characteristic of the eastern deciduous forest. Rather, patches of structurally different habitat are generated by minor topographic variations. In this tract and in the surrounding forest, the influence of small creeks, many of them intermittent, and of "sink-hole" areas is particularly evident. It is possible that some bird species may thrive in ecotonal areas within the forest interior between patches, or alternate seasonally between patch types. In this plot, Ovenbirds packed most densely in the optimum habitat of the upland slopes distal from the field and powerline edges. These birds had territories (Fig. 1) approaching the ½-acre minimum given by Hann (*Wilson Bull.* 49: 145-237). Some creek territories and all edge territories were larger. The creek territories seemed to be organized by large patches where Lady

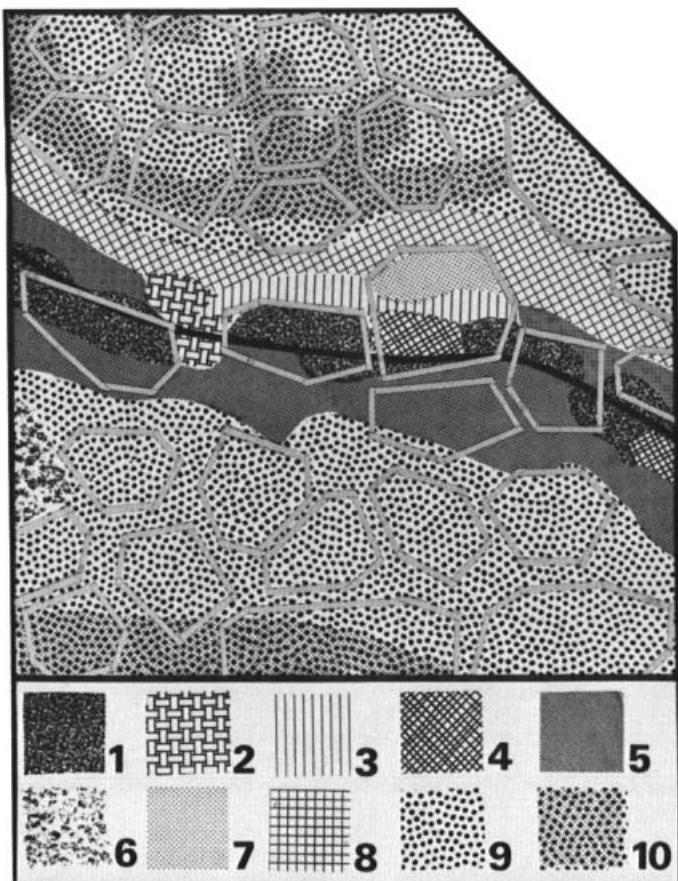


Fig. 1. Vegetational zones (Census No. 20) in relation to Ovenbird territories. Ovenbird territories (drawn polygonally) were closely associated with zones of the ericaceous shrub layer or fern patches, but avoided other zones. Red Maple and Black Gum were the dominant overstory trees in the vegetational belt along the creek. The shrub layer in this belt consisted of patches of Lady Fern (1), Greenbrier (2), Spicebush (4), White Alder (5) Cinnamon Fern (7), or highbush blueberries (*Vaccinium* spp.): (8). Upland forest (9) overstory trees were White and Black Oaks with scattered pine in some areas (10). The shrub layer in most upland areas (9) was ericaceous, and in a small zone (6) was predominantly Mountain Laurel (*Kalmia latifolia*). A more complex zone (3) had a mixed shrub layer including Swamp Bay Magnolia (*Magnolia virginiana*), *Ilex* spp., highbush blueberries, and *Viburnum* spp.

Fern or Cinnamon Fern dominated. Our estimate of 114 territorial males per 100 acres is among the highest reported for that species but may err on the low side, since most territorial definitions were formed by simultaneous registrations; it is in fact unlikely that all possible territorial separations would be observed during the limited time spent within this plot. Such close packing was also characteristic of many areas of open upland habitat in the surrounding forest. When we spent about 40 minutes within the territory of one actively singing bird, we observed that the defended territory was roughly elliptical, with axes of about 100 x 200 ft; during this period the male sang simultaneously with 4 adjacent territorial males, and 2 other birds were heard at a distance. This total of 7 simultaneous registrations

at a single point is the highest we encountered for any species. Although Black-and-white Warbler also occupied the upland forest, males often sang from the tract edge or at the ecotone between the creek vegetational belt and the upland. In this plot and elsewhere within the larger forest, Yellow-throated Vireos and Blue-gray Gnatcatchers appeared to utilize both upland and bottomland patches. Birds restricted to the vegetational belt along the creek included Hooded Warbler, Louisiana Waterthrush, Kentucky Warbler, and American Flycatcher; their territories were consequently long and narrow. The occurrence of Pine Warbler in a predominantly deciduous forest is characteristic of local woodlands and probably reflects a historically large population associated with pine succession. The high

avian species richness within the plot is attributable to its position within larger woods, which (1) accommodate raptors and wide foraging woodpeckers, (2) provide a diversity of habitat patches and ecotones in the forest interior, (3) support large local populations, and (4) provide protection from the unnaturally high levels of predation and parasitism commonly associated with smaller or more fragmented tracts. We thank Joel Rosen and Dr. Edward Terrell for assistance with the vegetational analysis, and Chandler Robbins and Dr. Paul Opler for assistance with the interpretation. — BRUCE WHITCOMB, STEPHEN WHITCOMB, 10271 Windstream Drive, Columbia, Md. 21045, ROBERT WHITCOMB (compiler), U.S. Dept. of Agriculture, ARS, PPI, Beltsville, Md. 20705.

21. MIXED HARDWOOD FOREST. — Location: Maryland, Calvert Co., NW of Plum Point and one mile inland from Chesapeake Bay on Tobacco Road between 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:** 21 of the 23 full trips were on clear days. High temperatures on census days varied between 58° and 96° F. The creek flowed all season and the bog remained wet. **Coverage:** April 12, 20, 23, 26, 28; May 3, 7, 9, 11, 14, 19, 21, 23, 28; June 2, 8, 15, 22, 29; July 6, 18, 26; August 4, 13. Total hours: 36.8; 23 full trips averaged 96 min. and started between 0645 and 1030 EST. **Census:** Red-eyed Vireo, 35 (309, 125); Wood Thrush, 24 (212, 86); Cardinal, 18 (159, 64); Ovenbird, 15 (133, 54); Carolina Wren, 13 (115, 46); Acadian Flycatcher, 11 (97, 39); Rufous-sided Towhee, 11; Kentucky Warbler, 8 (71, 29); Tufted Titmouse, 7 (62, 25); N. Parula, 7; Scarlet Tanager, 6 (53, 21); Downy Woodpecker, 5 (44, 18); E. Wood Pewee, 5; Louisiana Waterthrush, 4 (35, 14); Ruby-throated Hummingbird, 3 (26, 11); Red-bellied Woodpecker, 3; Carolina Chickadee, 3; Yellow-throated Vireo, 3; Pine Warbler, 3; Brown-headed Cowbird, 3; Am. Woodcock, 2; Hairy Woodpecker, 2; Great Crested Flycatcher, 2; Am. Robin, 2; Hooded Warbler, 2; Am. Redstart, 2; Indigo Bunting, 2; Field Sparrow, 2; Mourning Dove, 1; Blue Jay, 1; Com. Crow, 1; Blue-gray Gnatcatcher, 1; White-eyed Vireo, 1; Worm-eating Warbler, 1; Com. Yellowthroat, 1; Com. Grackle, 1; Summer Tanager, 1; Am. Goldfinch, 1; Turkey Vulture, +; Red-tailed Hawk, +; Broad-winged Hawk, +; Yellow-billed Cuckoo, +; Barred Owl, +; Pileated Woodpecker, +; Fish Crow, +; House Wren, +; Gray Catbird, +; Brown Thrasher, +; E. Bluebird, +; **Total:** 38 species; 213 territorial males (1880/km², 761/100 acres). **Remarks:** The 38 species on territory were 2 above the previous 14-year average; however, the territorial males decreased to 213 from the 270 recorded in 1974, and were below the 14-year average of 236. The Red-eyed Vireo and Wood Thrush were again the most numerous species although the latter showed a decline. The Cardinal was third and has declined still further. Other losses occurred with the Mourning Dove, Yellow-billed Cuckoo, Acadian Flycatcher, Carolina Chickadee, Tufted Titmouse, Carolina Wren, Yellow-throated Vireo, N. Parula, Hooded Warbler, and Rufous-sided Towhee. Not re-

corded were Com. Flicker and Yellow-throated Warbler. Increases were shown in the Ruby-throated Hummingbird, Am. Robin, Pine Warbler, Louisiana Waterthrush, and Field Sparrow. During this season telephone poles and a cable were installed on the road through the plot. — JOHN H. FALES, Ridge Road, Need Estate, Huntingtown, Md. 20639.

22. HICKORY—OAK—ASH FLOODPLAIN FOREST. — Location: Maryland; Howard Co., Middle Patuxent River, due W of Hobbits Glen Golf Course, Columbia; 39°15'10"N, 76°54'45"W, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; four intermittent years. **Size:** 18.4 ha = 45.5 acres (L-shaped following the 310-ft contour, surveyed). **Description of Plot:** See AB 25:963-964, 1971. Floodplain forest continues unbroken for 2400 ft downstream, and 3000 ft upstream to Md. Rte 108 (beyond which it extends unbroken for an additional 6000 ft). Total contiguous woodland, 1.1 mi² excluding tracts connected by corridors less than 600 ft wide. **Coverage:** May 17, 24, 31; June 9, 17, 24; July 1, 4 All 8 trips in early morning, starting within 30 minutes of sunrise. Total hours: 28. **Census:** Gray Catbird, 34.5 (187, 76); Acadian Flycatcher, 19 (103, 42); Red-eyed Vireo, 16 (87, 35); Am. Redstart, 16; Cardinal, 11.5 (62, 25); Com. Yellowthroat, 9 (49, 20); Tufted Titmouse, 8 (43, 18); Wood Thrush, 8; N. Parula, 8; Blue-gray Gnatcatcher, 7 (38, 15); White-eyed Vireo, 6.5 (35, 14); Veery, 6 (33, 13); Downy Woodpecker, 5.5 (30, 12); E. Wood Pewee, 5 (27, 11); Carolina Chickadee, 5; Red-bellied Woodpecker, 4 (22, 9); Carolina Wren, 4; Scarlet Tanager, 4; Cerulean Warbler, 3 (16, 7); Brown-headed Cowbird, 3; Yellow-throated Vireo, 2.5; Mourning Dove, 2; White-breasted Nuthatch, 2; Louisiana Waterthrush, 2; N. Oriole, 2; Indigo Bunting, 2; Rufous-sided Towhee, 2; Kentucky Warbler, 1.5; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Hairy Woodpecker, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Blue Jay, 1; House Wren, 1; Starling, 1; Am. Goldfinch, 1; Wood Duck, 0.5; Pileated Woodpecker, 0.5; Rough-winged Swallow, 0.5; Com. Crow, 0.5; Hooded Warbler, 0.5; Green Heron, +; Turkey Vulture, +; Red-tailed Hawk, +; Red-shouldered Hawk, +; Belted Kingfisher, +. **Total:** 48 species; 211.5 territorial males (1,149/km², 465/100 acres). **Remarks:** The most striking change in this year's census was the decline in Kentucky Warblers from 9 pairs in 1971 and 4.5 pairs last year to 1.5 pairs this year. The other species showing a notable decrease is the White-eyed Vireo, which has dropped from 11.5 in 1971 to 6.5 in 1975. While the White-eyed Vireo has decreased, the Red-eyed Vireo has increased to twice its population of 4 years ago. Gray Catbirds have continued their sharp increase and reached a new high of 34.5 pairs this year. Veeries and Com. Yellowthroats also have been increasing gradually each year of this study. The N. Parula, which reached a new high this year, seems to be replacing the Cerulean Warbler; if there is any competition between these two species, the Cerulean Warblers would have been at a big disadvantage this year because of their extraordinarily late arrival in the census plot (June 17 and June 24, compared with June 5 last year).

A pair of Rough-winged Swallows nested on the plot for the first time. — CHANDLER S. ROBBINS, *Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, Md.* 20811.

23. MATURE DECIDUOUS FLOODPLAIN FOREST. — **Location:** Maryland; Montgomery Co., Cabin John Island, Glen Echo; 2.5 miles 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, 23 intermittent years. **Size:** 7.6 ha = 18.75 acres (oblong, surveyed). **Description of Plot:** See AFN 1: 212-213, 1947. **Coverage:** March 29; April 12, 13, 19, 20, 26; May 9, 11, 18, 24-26, 31; June 8, 15, 22; 19 trips between 0620 and 1015 hours, EDT. Total man-hours: 49. **Census:** Starling, 24 (316, 128); Red-eyed Vireo, 10 (132, 53); Acadian Flycatcher, 8 (105, 43); N. Parula, 6.5 (86, 35); Carolina Wren, 6 (79, 32); Wood Duck, 4 (53, 21); Tufted Titmouse, 4; Cardinal, 4; Downy Woodpecker, 3 (40, 16); Carolina Chickadee, 3; Am. Redstart, 3; Blue-gray Gnatcatcher, 2; Song Sparrow, 1.5; Yellow-billed Cuckoo, 1; Barred Owl, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Yellow-throated Vireo, 1; Brown-headed Cowbird (female), 1; Prothonotary Warbler, 0.5. **Total:** 26 species; 91.5 territorial males or females (1206/km², 488/100 acres). **Remarks:** Nests found: Starling, 24; Wood Duck, 2; Barred Owl, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Com. Crow, 1; Cardinal, 2. The total of 91.5 territories is lower than last year's 98 and continues a downward trend which has been fairly regular since 1952. In 1947 the area supported 113 territories, 21.5 more than in 1975. This loss is associated with reduction in summer residents. Permanent residents, especially Starlings, have increased. The migrants chiefly involved in the decrease are the Wood Thrush, Veery, Red-eyed Vireo, N. Parula, Louisiana Waterthrush, and Am. Redstart. Although the census area has not changed materially, there has been extensive destruction of similar habitat nearby. — JOAN H. CRISWELL (compiler), W. H. CRAMER, J. R. GAUTHEY, *Audubon Naturalist Society*, 8940 Jones Mill Road, Washington, D. C. 20015.

24. MIXED UPLAND HABITAT. — **Location:** District of Columbia; the central third of Glover-Archbold Park, a long, narrow stream valley park in the NW section. **Continuity:** Established 1960; 16 consecutive years. **Size:** 14.2 ha = 35 acres (irregularly shaped, roughly 1520 x 1000 ft in outside dimensions). **Description of Plot:** See AFN 14: 502-503, 1960. **Coverage:** March 24; April 11-14, 20, 27; May 4, 11, 25; June 1-2, 7-8, 11, 14-15, 22; July 1, 5; from 0615 to 2100, with 20 in the morning and 4 in afternoon or evening. **Total:** 38.3 hours. **Weather:** Clear on two-thirds of the trips, cloudy or overcast on one-third; two-thirds were calm and one-third windy, up to 18 mph. Temperatures ranged from 40 to 80° F and averaged 61°. **Census:** Veery, 28 (198, 80); Cardinal, 23 (162, 66); Tufted Titmouse, 21 (148, 60); Starling, 17 (120, 49); Carolina Wren, 12 (85, 34); Carolina Chic-

kadee, 11 (78, 31); Gray Catbird, 11; Rufous-sided Towhee, 10 (71, 29); Blue Jay, 9 (64, 26); Com. Crow, 9; Red-eyed Vireo, 7 (49, 20); Downy Woodpecker, 6 (42, 17); Red-bellied Woodpecker, 5 (35, 14); Com. Flicker, 4 (28, 11); Pileated Woodpecker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Mockingbird, 2; Wood Thrush, 1.5; Am. Robin, 15; Mourning Dove, 1; Brown Thrasher, 1; Screech Owl, +; Acadian Flycatcher, +; E. Wood Pewee, +; Com. Grackle, +; Brown-headed Cowbird, +. **Total:** 27 species; 188 territorial males (1327/km², 537/100 acres). **Remarks:** Nests found: Pileated Woodpecker, 1; Com. Crow, 3; Starling, 7. Trends noted over the past years of this census continued. Where we once had 45 nesting species, we now have 27, although the total of territorial males is near the average of 190. Year-around residents tend to maintain their numbers or to increase, while most migratory species decline. Veeries are one exception, equaling their 1971 high again this year, though they were down to 11 in 1973. Wood Thrushes, which have declined over the census years in proportion as the Veeries have increased, are up to 15 from + last year, but there were 12 in 1961. Veeries first appeared in the Park in the early 1950s. Woodpeckers maintain steady populations, although we missed Hairy this year. Acadian Flycatchers kept at about 9 until 1967, and have since declined to a visitor status last year, and now a +. When birds become so scarce, they may become even harder to find if the lack of competition gives them less stimulus to sing. Poor coverage in the last weeks of the breeding season may have affected some totals, but cannot account for the almost total loss of warblers. Last year we were down to 1.5 Am. Redstarts and a + for Louisiana Waterthrush. This year warblers were only two visitors Am. Redstart and Ovenbird. In 1961 we had 6 species of nesting warblers, with 32 pairs, including 15 pairs of redstarts. Red-eyed Vireos came up from 5 to 7 since last year, but the high was 16 in 1968. — SHIRLEY A. BRIGGS (compiler), MICHAEL HOFFMAN, OLIVE HOLBROOK, and DONALD WEBER. 1621 Wisconsin Ave., NW, Washington, D.C. 20007.

25. UPLAND OAK—HICKORY FOREST. — **Location:** Virginia; Fairfax Co., Dranesville District Park, McLean, along Rte 193 (Old Georgetown Pike), approximately $\frac{1}{4}$ mile W of Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973, 3 consecutive years. **Size:** 11.0 ha = 27.2 acres (measured on topographic map compiled by photogrammetric methods from aerial photograph). **Description of Plot:** See AB 25: 636, 1971. **Weather:** Clear throughout. During the period, several windstorms blew down a number of trees; high winds were encountered only on April 5 and May 31. Temperatures ranged from 35 to 88° F. **Coverage:** April 5, 11, 22; May 7, 10, 16, 20, 31; June 9; July 24, 16. Five trips between 0610 and 1120; six between 1630 and 2015; one between 1112 and 1339. Total party-hours: 27. **Census:** Red-eyed Vireo, 6 (55, 22); Carolina Chickadee, 4 (36, 15); Red-bellied Woodpecker, 3.5 (32, 13); White-breasted Nuthatch, 3 (27, 11); Carolina Wren, 3; Hairy Wood-

pecker, 2; Downy Woodpecker, 2; E. Wood Pewee, 2; Tufted Titmouse, 2; Wood Thrush, 2; Cardinal, 2; Scarlet Tanager, 1.5; Mourning Dove, 1; Great Crested Flycatcher, 1; Acadian Flycatcher, 1; Blue Jay 1; Brown Creeper, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Louisiana Waterthrush, 0.5; Kentucky Warbler, 0.5. **Total:** 24 species; 44 territorial males or females ($400/\text{km}^2$, 162/100 acres). **Remarks:** A large portion of the field work was done in the afternoon and there was no coverage between June 9 and July 24; these facts may have affected the results. There were 89 territorial birds in 1973 and 68.5 in 1974, hence this year's 44 marks a second straight year of precipitous decline. The number of species has remained fairly constant (25, 21, and 24 for the three years 1973-1975 respectively), with two new species recorded this year (Mourning Dove and Gray Catbird). Three species found in 1973 have since been only visitors (Pileated Woodpecker, Ovenbird, Cerulean Warbler). Species that have declined compared with 1973, include Tufted Titmouse, from 7 to 2; Wood Thrush, from 6 to 2; E. Wood Pewee, from 5.5 to 2; Blue Jay, from 6 to 1; Kentucky Warbler, from 3 to 0.5; and Scarlet Tanager, from 5 to 1.5. — JOHN B. BAZUIN, JR., JESSICA M. GIUSTI, VALERIE KITCHENS, SARAH THOMAS, BARRY S. TINDALL, DON WIESNET, ROBERT M. WATSON, ROBERT J. WATSON (compiler), 2636 Marcey Road, Arlington, Va 22207.

26. UPLAND TUPLIP-TREE—OAK FOREST. — **Location:** Virginia; Fairfax Co., USGS National Center, Reston; $38^\circ56'45''\text{N}$, $77^\circ21'50''\text{W}$, Vienna Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 20.6 ha = 50.9 acres. **Description of Plot:** See AB 28: 701-2, 1974 and AB 28: 1003-4, 1974. **Coverage:** March 1; April 2, 11, 15; May 4, 9, 12, 18, 21, 27-30; June 3, 10, 12, 16, 26, 30; July 6, 12, 14, 17. Most trips in early morning or late afternoon. Total man-hours: 24.7. **Census:** Wood Thrush, 6 (29, 12); Blue Jay, 5 (24, 10); Carolina Wren, 4 (19, 8); Red-bellied Woodpecker, 3 (15, 6); E. Wood Pewee, 3; Carolina Chickadee, 3; Tufted Titmouse, 3; Ovenbird, 3, Cardinal, 3; Downy Woodpecker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Worm-eating Warbler, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; Rufous-sided Towhee, 2; Com. Flicker, 1; Acadian Flycatcher, 1; Brown Thrasher, 1; Louisiana Waterthrush, 1; Hooded Warbler, 1; Scarlet Tanager, 1. **Total:** 23 species; 55 territorial males ($267/\text{km}^2$, 108/100 acres). **Remarks:** Nests located: Com. Flicker, 1; Downy Woodpecker, 1; Blue Jay, 2; Carolina Chickadee, 1; Carolina Wren, 1; Brown Thrasher, 1; Wood Thrush, 10; Ovenbird, 1; Cardinal, 4. — JOAN C. WOODWARD and PAUL W. WOODWARD, 2433 Southgate Square, Reston, Va. 22091.

27. MIXED DECIDUOUS FOREST. — **Location:** North Carolina, Orange Co., 4.5 miles N of Chapel Hill on N. C. Rte. 86; Duke Natural Area; $35^\circ59'\text{N}$, $79^\circ04'\text{W}$, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size:** 8.8 ha =

21.8 acres. **Description of Plot:** See AB 27: 1018-1019, 1973. **Weather:** Wet winter preceded census, average in April and May, hot and dry in June. **Coverage:** April 21, 26, 29; May 2, 6, 10, 15, 25; June 6, 16, 21; between 0600 and 1015 except for one trip 1540-1720. Total man-hours: 25. **Census:** Red-eyed Vireo, 12 (136, 55); Acadian Flycatcher, 8 (91, 37); Carolina Wren, 7 (79, 32); Wood Thrush, 7; Ovenbird, 5 (57, 23); Scarlet Tanager, 3.5 (40, 16); Red-bellied Woodpecker, 3 (34, 14); Tufted Titmouse, 3; Louisiana Waterthrush, 3; Cardinal, 3; Yellow-billed Cuckoo, 2.5; Carolina Chickadee, 2.5; Hairy Woodpecker, 2, Downy Woodpecker, 2; N. Parula, 2; Hooded Warbler, 1.5; Blue-gray Gnatcatcher, 1; Yellow-throated Warbler, 1; Blue Jay, +; Com. Crow, +; Worm-eating Warbler, +; Pine Warbler, +; Kentucky Warbler, + **Total:** 23 species; 69 territorial males ($782/\text{km}^2$, 317/100 acres). **Remarks:** Six nests were located: Ovenbird 2, Hairy Woodpecker 1, Carolina Wren 1, Wood Thrush 1, Louisiana Waterthrush 1. The total number of territorial males is about the same as the past two years, indicating continued stability. Yellow-billed Cuckoos were absent last year, 2.5 males this year. Hairy Woodpeckers only visited the plot last year, 2 males this year. — AMY DAVIS, JOHN HORN, MARK HUFF, ROBERT S. RIDGELY, NORMAN BUDNITZ (compiler), Dept. of Zoology, Duke Univ., Durham, N. C. 27706.

28. UPLAND MIXED FOREST. — **Location:** North Carolina; Wilkes Co., 0.25 mile from North Wilkesboro, just W of Finley Park. **Continuity:** Established 1954; 22 consecutive years. **Size:** 15 ha = 37 acres (formerly 40 acres but reduced by building and road construction). **Description of Plot:** See AFN 8 367, 1954. **Coverage:** May 6; June 6, 10, 13, 16, 19, from 0900 to 1730. Total: 14 hours. **Census:** Wood Thrush, 7 (47, 19); Cardinal, 7; Carolina Wren, 6 (40, 16); Rufous-sided Towhee, 6; Mourning Dove, 4 (27, 11); Acadian Flycatcher, 3 (20, 8); Blue Jay, 3; Tufted Titmouse, 3; Am. Robin, 3; Red-eyed Vireo, 3; Ovenbird, 3; Kentucky Warbler, 3; Com. Grackle, 3; Com Flicker, 2; Red-bellied Woodpecker, 2; Scarlet Tanager, 2; Screech Owl, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Brown Thrasher, 1; Summer Tanager, 1. **Total:** 24 species; 68 territorial males ($456/\text{km}^2$, 184/100 acres). — WENDELL P SMITH, North Wilkesboro, N. C. 28659.

29. MOUNTAIN RAVINE MIXED FOREST. — **Location:** Georgia; Rabun Co., headwaters of Cuttingbone Creek in the Chattahoochee National Forest, 4 miles SSE of Clayton. **Continuity:** Established 1969, 7 consecutive years. **Size:** 5.9 ha = 14.7 acres (rectangular, 400 x 1600 ft measured). **Description of Plot:** See AFN 23: 710-711, 1969. There have been no perceptible changes in the forest cover in the last year. **Coverage:** April 4, 16, 20, 23, 27, 30; May 3, 6, 10, 14, 17, 20, 22, 25-26, 29, 31; June 3, 5, 8, 13, 17, 19, 22, 24, 26, 28; July 1, 3, 5. Several trips before daylight and after dark; most between daybreak and 0900, EDT. Total man-hours: 56. **Census:** Red-eyed Vireo, 8 (134, 54); Acadian Flycatcher, 6 (101, 41); Hooded Warbler,

5 (84, 34); Cardinal, 5; Tufted Titmouse, 3 (50, 20); Carolina Wren, 3; Worm-eating Warbler, 3; Pileated Woodpecker, 2; Blue Jay, 2; Carolina Chickadee, 2; White-breasted Nuthatch, 2; Swainson's Warbler, 2; Black-throated Green Warbler, 2; Ovenbird, 2; Scarlet Tanager, 2; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Wood Thrush, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Red-tailed Hawk, +; Broad-winged Hawk, +; Ruffed Grouse, +; Yellow-billed Cuckoo, +; Screech Owl, +; Barred Owl, +; E. Wood Pewee, +; Com. Crow, +; Gray Catbird, +; Blue-gray Gnatcatcher, +. **Total:** 31 species; 55 territorial males (925/km²; 374/100 acres). **Remarks:** Two broods of Carolina Wrens, and one each of Tufted Titmouse, Carolina Chickadee and Scarlet Tanager were seen. Tony Hellings, Ange Hinrichs, Caroline G. Newhall and Louis Schweizer assisted. — E. O. MELLINGER, *Tiger, Ga.* 30576.

30. RED OAK—SUGAR MAPLE FOREST. — **Location:** Ontario, Norfolk Co., 13 miles E of Port Rowan, Squires Ridge on Long Point; 42°33'N, 80°14'W, Little Creek Ridges, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** Established 1973; 2 intermittent years. **Size:** 6.88 ha = 17 acres (L-shape, surveyed.) **Description of Plot:** See AB 27: 967-968, 1973. **Edge:** The north side was at some points less than 100 ft from the shore of Lake Erie; it ran through marsh bordering the lake. The western border was very close to a plantation of conifers. The other two sides were edged by similar forest. **Weather:** Mainly clear with temperatures from 75° - 85° F. **Coverage:** June 15-18, 20, 29, 30; July 1-5; between dawn and 1100, EST. Total man-hours: 52. **Census:** House Wren, 11 (160, 65); Red-winged Blackbird, 8 (116, 47); E. Wood Pewee, 6 (87, 35); Red-eyed Vireo, 4 (58, 24); N. Oriole, 3 (44, 18); Com. Flicker, 2; E. Kingbird, 2; Great Crested Flycatcher, 2; Tree Swallow, 2; Com. Grackle, 2; Mallard, 1; Downy Woodpecker, 1; Am. Robin, 1. **Total:** 13 species; 45 territorial males (654/km², 265/100 acres). **Remarks:** 4 nests found: Mallard, Tree Swallow, House Wren, Red-winged Blackbird. The presence of Mallard and Green Heron in this habitat is probably owing to edge effect caused by proximity to Lake Erie. — RALPH CARTAR, EDWARD DICK, JON McCACKEN, GARY MILLER, PAMELA ROY (compiler), *Long Point Bird Observatory, Port Rowan, Ontario, NOE 1MO, Canada.*

31. 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; 6 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 25:993, 1971. **Weather:** 17 to 25°C; mostly sunny and warm. **Coverage:** May 19, 25; June 7-10, 12-15, 20-22, 30; July 6. All trips except 3 between 0530 and 1000 hrs. Total man-hours: 31. **Census:** Am. Robin, 8 (40, 16); Wood Thrush, 6 (30, 12); House Sparrow, 6; Cardinal, 6; Indigo Bunting, 6; Com. Grackle, 5 (25, 10); Great Crested Flycatcher, 4 (20, 8); Blue Jay, 4; Starling, 4; Com. Flicker, 3 (15, 6); E. Wood Pewee, 3; Mourning Dove, 2; Downy Woodpecker, 2; Black-capped Chickadee, 2; Red-eyed Vireo, 2; N. Oriole, 2;

Carolina Wren, 1; Red-winged Blackbird, 1; Song Sparrow, 1. **Total:** 19 species; 68 territorial males (340/km², 137/100 acres). **Remarks:** The increase in total density was partly owing to increases in the commoner species; i.e., Am. Robin, Starling, House Sparrow, Com. Grackle. In addition Wood Thrush, Great Crested Flycatcher and E. Wood Pewee increased over last year. The Gray Catbird appeared but did not stay and the Song Sparrow dropped to one pair from a maximum of 4 pairs in 1973. The Carolina Wren is a first for this census and was regularly recorded before during and after the census period. The annual foliage growth in the ravine was dense, and the total cover is increasing. There has been some cutting of dead trees. The use of the area by foot and bicycle traffic is increasing slowly. — DONALD PACE and ERIC NASMITH (compiler), *37 Pears Avenue, Toronto Onatario, M5R 1S9, Canada*

32. MATURE MIXED HARDWOOD FOREST —

Location: Michigan; Oakland Co.; Southfield Civic Center Nature Area, entrance off Evergreen Rd. at Civic Center Dr.; 42°30'N, 83°15'W, Royal Oak Quadrangle USGS. **Continuity:** Established 1974. **Size:** 9.3 ha = 23 acres. **Description of Plot:** See AB 28: 1005-1006, 1974. **Weather:** Temperature from 26 to 70° F. Heavy clouds on 4 trips, otherwise clear. Maximum wind 15 mph. According to the National Weather Service in Detroit, the mean average daily temperature and total precipitation for April were 40.9° F. and 2.5 in., departure from normal -6.8° and -0.72 in.; for May, 62.8° and 2.82 in., departure from normal 4.7° and -0.49 in., for June, 69.0° and 2.39 in., departure from normal 0.7° and -1.03 in. **Coverage:** April 22-23, 25-26, 27, May 14, 16, 23-24, 26, 31; June 4, 7, 10, 15; between 0510 and 0745 or 1950 and 2105 hours, EDT. Total man-hours: 35. **Census:** Starling, 13 (140, 57); Com Flicker, 10.5 (113, 46); Cardinal, 10 (107, 43); Downy Woodpecker, 7 (75, 30); Am. Robin, 6 (64, 26); Great Crested Flycatcher, 5 (54, 22); Indigo Bunting, 5, Red-winged Blackbird, 4 (43, 17); Song Sparrow, 4, Ring-necked Pheasant, 3.5 (38, 15); Com. Crow, 2.5, Mallard, 2; Red-headed Woodpecker, 2; House Wren, 2; Com. Grackle, 2; E. Wood Pewee, 1.5; Gray Cat



Census 32. Southfield Civic Center Nature Area. Photo/B Challis.

bird, 1.5, Wood Thrush, 1.5, Canada Goose, 1, Am. Kestrel, 1; Hairy Woodpecker, 1; E. Kingbird, 1; Blue Jay, 1; Red-eyed Vireo, 1; Rose-breasted Grosbeak, 1; Am. Goldfinch, 1; Bobwhite, +; Spotted Sandpiper, +; Black-capped Chickadee, +; Tufted Titmouse, +. Total 30 species, 93 territorial males ($999/\text{km}^2$, 404/100 acres). **Remarks:** Nests found: Com. Crow 2, Blue Jay 1, Canada Goose 1, and Am. Kestrel 1. Showing substantial increase over last year were Com. Flicker, 4.5 to 10.5; Cardinal, 6.5 to 10; Downy Woodpecker, 2 to 7, Indigo Bunting 1 to 5; Great Crested Flycatcher, 2 to 5. Decreased were Song Sparrow, 6 to 4; House Wren, 3 to 2; E. Wood Pewee, 2 to 1.5; Gray Catbird, 2 to 1.5, Wood Thrush, 2 to 1.5; Red-eyed Vireo, 1.5 to 1; Tufted Titmouse, 1 to +. Absent this year was the White-breasted Nuthatch. New nesting species were Am. Kestrel, Bobwhite, E. Kingbird, Black-capped Chickadee, and Rose-breasted Grosbeak. Thanks to Southfield Civic Center for their continued support. — BETTY CHALLIS, *Oakland Audubon Society, 2335 Pontiac Lk. Rd., Pontiac, Mich. 48054.*

33. MIXED HARDWOOD FOREST. — **Location:** Michigan; Washtenaw Co., 3 miles S of Ann Arbor on the N side of Morgan Road, $\frac{1}{4}$ mile W of the intersection of Morgan and Stone School Roads. **Continuity:** Established 1966; 10 consecutive years. **Size:** 7.2 ha = 17.8 acres (rectangular 430 x 200 yards, paced). **Description of Plot:** See AFN 20: 612, 1966. **Coverage:** May 24-26, 30-31; June 1-2, 6, 8, 12-13, 15; from 0600 to 1130; 1800-2240. Hours totaled about 24 (18.4 in the morning). Man-hours: 39.5. **Census:** Red-eyed Vireo, 5 (69, 28); E. Wood Pewee, 4 (56, 22); Wood Thrush, 2.5; Cardinal, 2.5; Com. Flicker, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Rufous-sided Towhee, 2; Red-headed Woodpecker, 1.5; Hairy Woodpecker, 1.5; Great Crested Flycatcher, 1.5; Am. Robin, 1.5; Indigo Bunting, 1.5; Screech Owl, 1; Red-bellied Woodpecker, 1; Tufted Titmouse, 1; Gray Catbird, 1; Song Sparrow, 1; Red-tailed Hawk, +; Com. Crow, +; Brown Thrasher, +; N. Oriole, +; Scarlet Tanager, +; Rose-breasted Grosbeak, +. **Total:** 24 species; 34 territorial males ($472/\text{km}^2$, 191/100 acres). — JANICE JOHNSON (compiler), *Washtenaw Audubon Society, 130 N. Clubview Dr., Ypsilanti, Mich. 48197.*

34. NORTHERN HARDWOODS. — **Location:** Michigan; Iron Co., Camp Filibert Roth; NE $\frac{1}{4}$ Sect. 26, T44N, R37W, Beechwood Quadrangle, USGS. **Continuity:** New. **Size:** 15.4 ha = 38 acres (rectangular 19 x 20 chains, measured by tape and compass). **Description of Plot:** Sugar Maple (*Acer saccharum*) dominated both the canopy and the understory. Trees 3-inches diameter and over, based on nine circular samples, 353/acre; total basal area $94.3 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees (figures after each give number of trees/acre, relative density (%), and frequency (%), in that sequence): Sugar Maple, 230, 65, 100; Yellow Birch (*Betula alleghaniensis*), 71, 20, 89; Am. Basswood (*Tilia americana*), 17, 5, 33; Black Cherry (*Prunus serotina*), 17, 5, 22. Canopy cover 87%, average canopy height

73 ft (range 60-100). **Edge.** Similar habitat in all directions. **Topography:** Gentle rise, E-W. **Elevation** 1670 ft. **Weather:** Early May was unusually warm with daytime temperatures reaching 90°F + only a week following spring breakup of nearby Golden Lake. Sky was overcast 6 days, partly cloudy 2, and clear 2. Rain or drizzle occurred on 2 of the overcast days. Temperatures ranged from 36° to 65° on morning counts, 65° to 70° on the two evening ones, with the morning average 50° . Winds were light or negligible. **Coverage:** June 1, 4, 6, 8-9, 11, 13, 15, 17, 21; between 0530 and 0700 or 1900 and 2100. Total man-hours: 101 (usually 8 participants per count). **Census:** Least Flycatcher, 14 (91, 37); Ovenbird, 12.5 (81, 33); Red-eyed Vireo, 9 (59, 24); Black-throated Green Warbler, 9; Hermit Thrush, 4 (26, 11); Am. Robin, 3 (20, 8); Rose-breasted Grosbeak, 2.5; Swainson's Thrush, 2; Veery, 2; Black-throated Blue Warbler, 2; Winter Wren, 1.5; Blackburnian Warbler, 1.5; Hairy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Scarlet Tanager, 1; Broad-winged Hawk, 0.5; Ruffed Grouse, 0.5; Barred Owl, 0.5; N. Parula, 0.5; Brown-headed Cowbird, +. **Total:** 21 species; 69 territorial males ($449/\text{km}^2$, 182/100 acres). Trees too uncommon to appear in the vegetation analysis above yet believed to influence breeding bird distribution were E. Hemlock (*Tsuga canadensis*), Am. Elm (*Ulmus americana*), and Black Ash (*Fraxinus nigra*). An abandoned logging access road extends E-W through the center of the plot, along it the canopy coverage varies from 40 to 95% and the hardwoods are somewhat taller than in the unbroken areas. Nests found: Least Flycatcher, 1; Hermit Thrush, 3; Veery, 1; Ovenbird, 3. One of the Hermit Thrush nests was parasitized by the Brown-headed Cowbird. This census was a cooperative group project of the University of Michigan's Camp Filibert Roth. Participants: M. Amicangelo, J. Balcomb, V. Barrord, M. Bosie, S. Feld, P. Hoak, M. Ittner, T. Kavanagh, J. Montrose, I. Morrow, P. Siegenthaler, J. Shulman, D. Toumari, L. Williams, B. Zwicker, and Doug Woodby (teaching assistant). — R. M. AND W. L. ANDERSON, 2171 Medford Rd. No. 29, Ann Arbor, Mich 48104.

35. OAK—MAPLE FOREST AND EDGE. — **Location:** Illinois, Champaign Co., Trelease Woods, 6 miles NE of Champaign. **Continuity:** Established 1941, 32 intermittent years. **Size:** 22.26 ha = 55 acres (rectangular, survey) plus 2 km = 1.25 miles of forest-edge. **Description of Plot:** See AFN 2: 232-233, 1948. **Coverage:** April 16, 30; May 10, 28; June 4, 12, 18, 25; July 16; August 6. All trips between 0700 and 1100 hours. Total man-hours: 36. The density of the forest-interior species has been calculated as the number of territorial males per km^2 and 100 acres; the density of the forest-edge species as the number per km and mile. **Census:** **Forest-interior Species:** House Wren, 10 (45, 18); Red-eyed Vireo, 6 (27, 11); Red-bellied Woodpecker, 5 (22, 9); E. Wood Pewee, 5; Yellow-billed Cuckoo, 4 (18, 7); Downy Woodpecker, 2; Great Crested Flycatcher, 2; Wood Thrush, 1; Hairy Woodpecker, 1; Carolina Wren, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; White-breasted Nuthatch, + **Forest-edge Species:** Starling, 61 (30, 49); Blue Jay, 14

(7, 11), Am. Robin, 12 (6, 10), Com. Flicker, 8 (4, 6), Indigo Bunting, 7 (4, 6); Cardinal, 6 (3, 5); Mourning Dove, 4 (2, 3); Field Sparrow, 3 (2, 2); Red-headed Woodpecker, 2; Red-tailed Hawk, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; Brown Thrasher, 1; Com. Yellowthroat, 1; N. Oriole, 1; Am. Goldfinch, 1; Song Sparrow, 1; Com. Crow, +; Com. Grackle, +; Brown-headed Cowbird, +; Rufous-sided Towhee, +. **Total** 13 species in forest-interior; 40 territorial males ($180/\text{km}^2$, 73/100 acres); 21 species in forest-edge; 125 territorial males ($62/\text{km}$, 100/mile). — S. CHARLES KENDEIGH and JOHN M. EDGINGTON, *Vivarium Building, Univ. of Illinois, Champaign, Ill. 61820.*

36. BEECH—MAPLE FOREST. — **Location:** Indiana, Fayette Co., Mary Gray Bird Sanctuary, 7 miles SW of Connersville: $39^{\circ}35'N$, $85^{\circ}14'W$, Alpine Quadrangle, USGS. **Continuity:** Established 1959; 5 intermittent years. **Size:** 8.22 ha = 20.3 acres (L-shaped, measured with steel tape). **Description of Plot:** See *AFN* 17: 496-497, 1963. Recent changes which have resulted in opening the crown involve a large fallen Am. Beech along the extreme northern boundary. Farther to the east of this same boundary a large beech has lost its top. Another large beech has fallen across the creek near the middle of the plot. Two large beech are down near the middle of the eastern boundary, and in this same area two large Sugar Maples have fallen. Another large beech is down in the southwestern part of the area. **Edge:** Surrounded on most sides by similar cover. However, open fields approach within 50 ft of the boundary for short distances (totaling 800 ft) at three places. **Topography:** Rolling hills, elevation 940-1010 ft. Two small creeks flow through the area. A "nature trail" winds through the eastern half of the plot. **Weather:** Warmer than usual throughout period. **Coverage:** April 20, 26; May 4, 10, 12, 18, 25, 31; June 14, 28-29. Most trips from dawn to approx. 0800. Total man-hours: 29+. **Census:** Cardinal, 10 (122, 49); Tufted Titmouse, 7 (85, 34); Acadian Flycatcher, 6 (73, 30), Red-eyed Vireo, 6; Great Crested Flycatcher, 5 (61, 25); Blue-gray Gnatcatcher, 5; Red-bellied Woodpecker, 4 (49, 20); E. Wood Pewee, 3 (37, 15); Carolina Wren, 3; Wood Thrush, 3; Rufous-sided Towhee, 2; Whip-poor-will, 1; Ruby-throated Hummingbird, 1; Blue Jay, 1; Brown-headed Cowbird, 4 (females); Indigo Bunting, 1; Summer Tanager, 1; Cerulean Warbler, 1; Kentucky Warbler, 1; Carolina Chickadee, 1. **Total:** 20 species; 62 territorial males + female cowbirds; ($755/\text{km}^2$, 305/100 acres). **Remarks:** 3 nests located: Red-bellied Woodpecker, Cardinal and Wood Thrush. Helping with the census were: Deanna Barricklow, Clifford Gough, J. Dan Webster, Henry C. West — MARY R. GOUGH, 901 Maplewood Drive, New Castle, Ind. 47362.

37. BLACK OAK—SASSAFRAS WOODS. — **Location:** Indiana: Porter Co., 1 mile E intersection of Rtes 49 and 12; $41^{\circ}37'N$, $87^{\circ}2'W$; NE/4 Porter 15' Quadrangle, USGS, within Indiana Dunes National Lakeshore park. **Continuity:** Established 1974. **Size:** 22.22 ha — 55 acres (weighed map pieces). **Description of Plot:** Burned over area making strong recovery

after fire. Root suckers now 16 - 18 ft high. Some areas virtually impenetrable after May 1. See *AB* 28: 6, 1007, 1974. **Errata:** Delete dwarf Colonial Shadbush (*Amelanchier spicata?*); Substitute Black Chokeberry (*Pyrus melanocarpa*). Delete Blueberry sp. *pennsylvanicum*; substitute *Vaccinium angustifolium laevifolium*.) **Weather:** Good. Particularly good berry year. **Coverage:** March 29; April 13, 20, 27; May 11-12, 17-18, 23-24, 30-31; June 7-8, 15-16, 28-29, July 4-5, 27. Majority of trips before 0900. Total hours: 60. **Census:** Com. Yellowthroat, 9 (40, 16), Brown Thrasher, 8 (36, 15); Rufous-sided Towhee, 8, Field Sparrow, 7 (31, 13); Gray Catbird 7; Indigo Bunting, 4 (18, 7); Golden-winged Warbler, 4; Com Flicker, 3 (13, 5); House Wren, 3; Bobwhite, 2; Mourning Dove, 2; Red-headed Woodpecker, 2; Blue Jay, 1; Veery, 1; E. Meadowlark, 1; Rose-breasted Grosbeak, 1. **Total:** 21 species; 72 territories ($323/\text{km}^2$, 131/100 acres). **Remarks:** Nests located: Com. Flicker, Red-headed Woodpecker, Am. Kestrel. Numbers are increasing as woods area recovers from fire. — EMMA B. PITCHER, 1159 E. 56th Street, Chicago, Ill. 60637.

38. SWAMP FOREST. — **Location:** Indiana, Spencer Co., about 1 mile W of Grandview, $37^{\circ}32'30''N$, $87^{\circ}00'W$, Rockport Quadrangle, USGS. **Continuity:** New. **Size:** 4.86 ha = 12 acres (rectangular, 835×626 ft, measured with a compass and steel tape). **Description of Plot:** Located about 2 miles N of the Ohio River. The dominant trees in order of their decreasing abundance are: Red Maple (*Acer rubrum*), Pin Oak (*Quercus palustris*), Red Elm (*Ulmus fulva*) and Shagbark Hickory (*Carya ovata*). Most prominent in the understory are Com. Greenbriar (*Smilax rotundifolia*), Honeysuckle (*Lonicera canadensis*) and Poison Ivy (*Rhus toxicodendron*). The woodland was logged approximately 15 years ago. **Topography:** Flat, elevation 393 ft. **Edge:** Surrounded on all sides by similar habitat for 90 ft. Beyond this are small scattered sections of similar swamp forests, abandoned fields and cultivated fields. **Water:** Owing to the flat nature of the topography and low elevation, drainage is poor and water 6-18 in. deep covered about 75% of the plot during the study period. **Weather:** Temperatures ranged between 48° and 79°F . **Coverage:** April 2, 4, 7-8, 11, 23, 25, 28-30. Total 10 trips, between 0700 and 1100 hours, averaging 75 minutes each. Total man-hours 12.5. **Census:** Starling, 3 (62, 25); Prothonotary Warbler, 3; Cardinal, 3; Blue-gray Gnatcatcher, 2; Red-bellied Woodpecker, 1; Downy Woodpecker, 1, Carolina Chickadee, 1; Tufted Titmouse, 1; Carolina Wren, 1; Swamp Sparrow, 1; Red-eyed Vireo, +, Yellow-throated Warbler, +. **Total:** 12 species; 17 territorial males or females ($350/\text{km}^2$, 142/100 acres) — RANDALL MADDING, WAPORA, Inc., 4901 Foley Road, Cincinnati, Ohio 45238.

39. VIRGIN BEECH—MAPLE FOREST. — **Location:** Ohio, Preble Co., 4 mi. N of Oxford, near the intersection of Brown and Main Loop Rds. in the Interpretive Reserve of Hueston Woods State Park; E $\frac{1}{2}$ of the SE $\frac{1}{4}$ of section 34, T6N, R1E, College Corner

Quadrangle, USGS. **Continuity**: Established 1974 (1973), 3 consecutive years. **Size**: 6.1 ha = 15 acres (1045 x 625 ft rectangle; compass, transient, steel tape). **Description of Plot**: See AB 28: 1009-1010, 1974. **Weather**: Temperature averaged about 5° above last year's 55°F during May. Most mornings were overcast with low wind. **Coverage**: May 5-6, 8-9, 13, 16, 18, 20-21, 25; June 21, 29. Trips mostly 0600 - 0900; two evening trips. Total: 25 man-hours. **Census**: Acadian Flycatcher, 11.5 (189, 77); Blue-gray Gnatcatcher, 9.5 (156, 63); Red-eyed Vireo, 9 (148, 60); Cardinal, 9, Cerulean Warbler, 7 (115, 47); Tufted Titmouse, 6 (99, 40); Brown-headed Cowbird (female), 6; Ovenbird, 5 (82, 33); Red-headed Woodpecker, 4 (66, 27); E Wood Pewee 4; Carolina Wren, 4; Gray Catbird, 3.5 (58, 23); Kentucky Warbler, 3.5; Com. Flicker, 3 (49, 20); Red-bellied Woodpecker, 3; Carolina Chickadee, 3, Hairy Woodpecker, 2.5; Great Crested Flycatcher, 2.5, Ruby-throated Hummingbird, 2; Downy Woodpecker, 2; Wood Thrush, 2; Mourning Dove, 1; Louisiana Waterthrush, 1; Rufous-sided Towhee, 1; Great Horned Owl, 0.5; Barred Owl, 0.5, Pileated Woodpecker, 0.5; White-breasted Nuthatch, 0.5; House Wren, 0.5; Indigo Bunting, +. **Total**: 30 breeding species, 108 territorial males or females (1779/km², 720/100 acres). **Remarks**: Fewer species are recorded this year, but with a corresponding increase in the total number of territorial males. With the exception of Scarlet Tanager and Yellow-throated Vireo, the missing species were breeding in adjacent areas. The number of cowbirds showed a 6-fold increase which was reflected in the parasitism of 4 out of 5 Cardinal nests. Nests were found for all Picidae. I thank the Ohio Dept. of Natural Resources for permission to make this study. — SALLY WATERHOUSE, Miami Univ., Dept. of Zoology, Oxford, Ohio, 45056.

40. MIXED DECIDUOUS FOREST. — **Location**: Tennessee; Hawkins Co., 3 miles E of Surgeonsville; 36°28'N, 82°49'W, Stony Point Quadrangle, USGS. **Continuity**: New. **Size**: 20 ha = 49.5 acres (irregular, surveyed). **Description of Plot**: Selective cutting of timber trees has occurred and much of the understory and ground cover has been destroyed by grazing. Reproduction of many species of trees is not occurring at this time and has not been significant during recent years. A quantitative analysis of the vegetation yielded the following: Trees, 3-inches diameter and over, based on five 0.1-acre circular samples, 234/acre; total basal area 146 ft²/acre. Species comprising 90% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): Am. Beech (*Fagus grandifolia*), 68, 29, 42, 80; White Oak (*Quercus alba*), 32, 14, 13, 40; Dead trees, 26, 11, 3, 60; Scrub Pine (*Pinus virginiana*), 22, 9, 9, 20; E. Red Cedar (*Juniperus virginiana*), 20, 9, 2, 20; Sourwood (*Oxydendrum arboreum*), 14, 6, 1, 80; Mockernut Hickory (*Carya tomentosa*), 10, 4, 5, 60; Black Oak (*Q. velutina*), 8, 3, 2, 60, Green Ash (*Fraxinus pennsylvanica*), 6, 3, 6, 40. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft²/acre, relative dominance): A (3-6 in.) 92, 39, 9.2, 6.3; B (6-9 in.) 44, 19, 13.2, 9; C (9-15

in.) 64, 27, 51.2, 35, D (15-21 in.) 28, 12, 50.4, 34, E (21-27 in.) 4, 1.7, 12.4, 8.5; F (27-33 in.) 2, 0.9, 9.8, 6.7. Shrub stems/acre, 990; ground cover, 11% canopy, 93% average canopy height, 60 ft (range 45-70). **Edge**: Bordered by similar forest except for two small sections that are within 50 ft of open fields. **Topography**: Hilly, with some steep slopes. **Elevation**: 1150 - 1295 ft. **Weather**: Rainfall in the area totaled .41 in. during the first half of June, but the monthly total for May was 8.29 in. **Coverage**: June 6-15; 0600 to 0830. Total man-hours: 28. **Census**: Cardinal, 22 (110, 44), Carolina Wren, 12 (60, 24); Tufted Titmouse, 10.5 (52, 21); Red-eyed Vireo, 10 (50, 20); Yellow-billed Cuckoo, 7 (35, 14); Rufous-sided Towhee, 6.5 (32, 13), Carolina Chickadee, 6 (30, 12); Blue Jay, 4.5 (22, 9), Downy Woodpecker, 4 (20, 8); Great Crested Flycatcher, 3.5 (17, 7); Blue-gray Gnatcatcher, 2; Am Robin, 2; Brown-headed Cowbird, 2; Indigo Bunting, 2; Red-bellied Woodpecker, 1.5; Wood Thrush, 1.5, Summer Tanager, 1.5; Screech Owl, 1; Great Horned Owl, 1; Pileated Woodpecker, 1; Starling 1; Yellow-throated Vireo, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Field Sparrow, 1; Com. Flicker, 0.5; Brown Thrasher, 0.5; White-eyed Vireo, 0.5. **Total**: 27 species; 106 territorial males (529/km², 214/100 acres).

Remarks: 11 nests were located: Yellow-billed Cuckoo, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Blue Jay, 1; Carolina Wren, 1; Starling, 1, Cardinal, 4; Rufous-sided Towhee, 1. The population of Yellow-billed Cuckoos seemed high in comparison to other published censuses. [Perhaps this was because this census was conducted during the peak of their migration. See census No. 19. — ED.] — ALAN B SMITH, 7017 Northshore Dr., Knoxville, Tenn. 37919

41. TUPELO SWAMP. — **Location**: Louisiana, Evangeline Parish; Miller's Lake; 15.9 km NW of Ville Platte. The west boundary is 2.1 km NE of the south boat landing; 30°45'N, 90°20'W. Section 53 and 54, T3S, R1E, Ville Platte, La. Quadrangle, USGS. **Continuity**: New. **Size**: 10 ha = 24.7 acres (as measured from aerial photograph). **Description of Plot**: Located within a 1300+ ha freshwater lake. A quantitative survey based on 50 randomly located 0.1 ha (radius = 5.6 m) circular plots gave the following results: 1046 trees/ha with a dbh 7.5 cm and over: Basal areas, 45.4 m²/ha. Overstory species are Tupelo (*Nyssa aquatica*), 99.8%; and Carolina Ash (*Fraxinus caroliniana*), 0.2%. There are 980 shrubs/ha with a total basal area of 0.6 m²/ha as determined by individuals with a dbh between 1.3 and 7.5 cm within 50 randomly located .001 ha (radius = 1.8 m) circular plots. Understory species are Com. Buttonbush (*Cephaelanthus occidentalis*), 70.; and Carolina Ash, 29.6%. The ground cover consists of Floating Bladderwort (*Utricularia inflata*), Fanwort (*Cabomba caroliniana*), Water-lettuce (*Pistia stratiotes*), Water Hyacinth (*Eichhornia crassipes*), and duckweed (*Lemnaceae*). **Topography**: Flat, elevation 22.9 m. **Edge**: Part of a 20-ha Tupelo swamp. The west boundary is adjacent to open water. The other boundaries are within the swamp. The average water depth is 1.1 meters. **Weather**: During the count period, the temperature ranged from 20 to 35°C. During counts, the average temperature was 22°C, cloud cover averaged

15%, and the wind averaged 8 km/hr. Rainfall during the period was 8.9 cm. **Coverage:** May 19, 27; June 4, 12, 16-17; between 0640 and 0845, averaging 85 minutes each. **Census:** Prothonotary Warbler, 20 (200, 81); Great Crested Flycatcher, 19 (190, 77); Acadian Flycatcher, 14 (140, 57); N. Parula 11 (110, 45); Red-winged Blackbird, 9 (90, 36); Red-bellied Woodpecker, 8 (80, 32); Downy Woodpecker, 8; Carolina Chickadee, 8; Carolina Wren, 8; Cardinal, 8; Com. Grackle, 7 (70, 28); Chimney Swift, 4 (40, 16); Starling, 4; N. Oriole, 4; Brown-headed Cowbird, 4; Blue Jay, 3 (30, 12); Yellow-crowned Night Heron, 2; Wood Duck, 2; Yellow-billed Cuckoo, 2; Tufted Titmouse, 2; Summer Tanager, 2; Purple Gallinule, 1; E. Kingbird, 1; Red-eyed Vireo, 1; Com. Gallinule, +; Hairy Woodpecker, +. **Total:** 26 species; 154 territorial males ($1540/\text{km}^2$, 623/100 acres). — BRENT ORTEGO and ROBERT E. NOBLE, School of Forestry and Wildlife Management, Louisiana State Univ., Baton Rouge, La. 70803.

42. OAK—HICKORY FOREST. — **Location:** Kansas; Jefferson Co., on the University of Kansas' Rockefeller Experimental Tract and the Nelson Environmental Studies Area. Predominantly on the SW $\frac{1}{4}$, NW $\frac{1}{4}$, Section 3, T-11S, R-20E, Midland Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 9.7 ha = 24 acres (rectangular 359.7 x 270.1 meters). **Description of Plot:** See AB 28: 1010-1011, 1974. **Weather:** The mean temperature during census hours was 63.4°F (range 51-78°). Precipitation for the census period was only slightly above average. **Coverage:** May 28, 30-31; June 9-10, 13, 17, 20; between 0715 and 0930 CDT. Total man-hours: 18. **Census:** Blue Jay, 5 (51, 21); E. Wood Pewee, 5; Mourning Dove, 4 (41, 17); Black-capped Chickadee, 4; Tufted Titmouse, 4; White-breasted Nuthatch, 3 (31, 13); Wood Thrush, 3; Kentucky Warbler, 3; Rose-breasted Grosbeak, 3; Downy Woodpecker, 2.5; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Red-headed Woodpecker, 2; N. Oriole, 2; Brown-headed Cowbird, 2; Am. Woodcock, 1; House Wren, 1; Carolina Wren, 1; Red-eyed Vireo, 1; Rufous-sided Towhee, 1; Red-tailed Hawk, +; Am. Robin, +. **Total:** 22 species; 52.5 territorial males ($541/\text{km}^2$, 219/100 acres). **Remarks:** Nests found: Mourning Dove 3, Blue Jay 2, E. Wood Pewee 2, woodcock 1, Red-headed Woodpecker 1, Wood Thrush 1, N Oriole 1, Rose-breasted Grosbeak 1. Two fewer species were recorded on the area this year compared to 1974 and the number of territorial males increased slightly. Hairy Woodpeckers, Blue-gray Gnatcatchers, Summer Tanagers and N. Parulas were conspicuously absent. The most noticeable change was a decrease in the Cardinal population from five to two pairs. Red-headed Woodpeckers, N. Orioles, Kentucky Warblers and Rose-breasted Grosbeaks showed increases while Yellow-billed Cuckoos, Am. Robins and Wood Thrushes were less numerous. No noticeable changes in habitat were observed that might account for these fluctuations. — CALVIN L. CINK, Museum of Natural History, Univ. of Kansas, Lawrence, Kans. 66045.

43. VIRGIN SCRUB OAK FOOTHILLS. — **Location:** Oklahoma; Osage Co.; from intersection of U.S.

60 and Okla. 123, 5 miles W and 2.5 miles SW, 96°06'N, 36°44'W, Woolaroc Quadrangle, 7.5 min series USGA, SW one-fourth of SE quarter of section 10-26-11. **Continuity:** New. **Size:** 16.2 ha — 40 acres (square, original survey three sides, fourth side compassed.) **Description of Plot:** Principally Black Jack and Post Oak trees and shrubs that have never been cut, on sandy loam containing sandstone outcroppings (about 7%). Southwest edge includes a steep 15 to 30 ft canyon wall and about 5 acres of sloping canyon floor. A two-tenths acre artificial pond and a 200-yard jeep trail are the only disturbed areas. Plot includes 4 drainage gullies into the canyon. Following is a survey of the vegetation using 10 tenth-acre circles: Trees 3-inches in diameter and over, 65/acre; total basal area, 35.9 ft²/acre. Numbers indicate trees per acre, relative density, dominance and frequency: Black Jack Oak (*Quercus marilandica*) 43, 66, 35, 80; Post Oak (*Q. stellata*) 14, 22, 50, 80; dead trees 6, 9, 12, 40; Black Walnut (*Juglans nigra*) 1, 2, 1, 10; hickory (*Carya* sp.) 1, 2, 2, 10. Trees by diameter size class (figures give number of trees/acre, relative density, basal area in sq. ft/acre, relative dominance): A (3-6 in.) 28, 43, 2.8, 8; B (6-9 in.) 11, 17, 3.3, 9; C (9-15 in.) 17, 26, 13.6, 38, D (15-21 in.) 9, 14, 16.2, 45. Shrub stems/acre (predominantly oak sprouts) 28,650; ground cover 93%; canopy cover 19%; average canopy height 24 ft (range 15-35). Trees are stunted because of soil conditions, periodic wind storms and fire. Shadbush (*Amelanchier arborea*), Chittim-wood (*Bumelia lanuginosa*), Black Oak (*Q. velutina*) and Sumac (*Rhus glabra*) were present in and near the canyon. Bluestems (*Andropogon* sp.) and Wild Alfalfa (*Pisum sativum*) were dominant in the ground cover. **Edge:** Bordered on all sides by similar habitat. **Topography:** 80% is ridge and gentle 3-15% slopes toward canyon. Canyon wall is near vertical. **Elevation:** 800 - 940 ft. **Weather:** Cool and very wet. **Coverage:** April 10, 16, 24, 28; May 6, 15, 22, 26; June 6; between dawn and 1045 hours except one trip 1730 to 2040 hours. Total man-hours 40. **Census:** Great Crested Flycatcher, 4 (25, 10), Red-headed Woodpecker, 3 (19, 8); Bewick's Wren, 3, Black-and-white Warbler, 3; Brown-headed Cowbird, 3; Cardinal, 3; Field Sparrow, 3; Mourning Dove, 2.5, Tufted Titmouse, 2.5; Yellow-billed Cuckoo, 2, Blue Jay, 2; White-breasted Nuthatch, 2; Brown Thrasher, 2, Blue-gray Gnatcatcher, 2; Bobwhite, 1.5; Carolina Chickadee, 1.5; Yellow-breasted Chat, 1.5; Black-billed Cuckoo, 1; Red-bellied Woodpecker, 1; Downy Woodpecker, 1; Carolina Wren, 1; Red-winged Blackbird, 1; Painted Bunting, 1; E. Bluebird, 0.5, Summer Tanager, 0.5; Hairy Woodpecker, +, E Meadowlark, +; Lark Sparrow, +. **Total:** 28 species, 48.5 territorial males ($300/\text{km}^2$, 121/100 acres). **Remarks:** Woodpeckers and other hole dwellers were prominent because of the large number of dead trees. A small tornado touched a portion of the ridge May 10 knocking down a small tree and thicket. Parts were censused by sound because of the dense impenetrable thickets. By early June, the entire plot was a tick and snake filled near-impassable wilderness. Three horses grazed a corner of the plot. Special thanks to Mrs Karl Hachmuth for permission to census her land. — ELLA DELAP and DOTTY M. GOARD, P.O. Box 591, Bartlesville, Okla. 74003.

44. BALSAM FIR—BIRCH FOREST. — **Location**: Minnesota; St. Louis Co., Duluth, 1 mile N of Island Lake Reservoir Bridge on County 4; NE $\frac{1}{4}$ -NE $\frac{1}{4}$ Sect. 32, T53N, R14W-4th P.M. Boulder Lake Reservoir Quadrangle, USGS. **Continuity**: Established 1972; 4 consecutive years. **Size**: 12.25 ha = 30.27 acres (square, 49.50x50m plots, using calibrated wire and compass). **Description of Plot**: An updated vegetation survey was conducted following the initial survey in 1972 (AB 26: 956, 1972). The dominant canopy trees are Balsam Fir (*Abies balsamea*), Paper Birch (*Betula papyrifera*), and Quaking Aspen (*Populus tremuloides*). Most prominent in the understory are dogwood (*Cornus* sp.), Beaked Hazel (*Corylus cornuta*), Balsam fir, and Mountain Maple (*Acer spicatum*). The ground cover is primarily Large-leaf N. Aster (*Aster macrophyllous*), Bracken fern (*Pteridium aquilinum*), Wild Sarsaparilla (*Aralia nudicaulis*), and Thimbleberry (*Rubus parviflorus*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on 36 circular samples, 472/acre; total basal area 88.7 ft²/acre. Species comprising 90% of the total number of trees: Balsam Fir, 167, 46, 33, 100; Paper Birch, 88, 24, 27, 94; Quaking Aspen, 33, 9, 14, 81; Bigtooth Aspen (*P. grandidentata*), 26, 7, 7, 25; Sugar Maple (*Acer saccharum*), 16, 4, 3, 50; Balsam Poplar (*P. balsamifera*), 14, 4, 6, 42. Trees by diameter size class: A (3-6 in.) 213, 59, 21.3, 24; B (6-9 in.) 113, 31, 33.8, 38; C (9-15 in.) 37, 10, 29.8, 34; D (15-21 in.) 2, 1, 3, 3. Shrub stems/acre 14, 979; ground cover 57%; canopy cover 50.5%; average canopy height 61 ft (range 43 - 76 ft); average shrub height 5.9 ft. **Weather**: Temperature 48 to 70°F. Wind from Beaufort 0 to 3; clear to fully overcast, no precipitation. **Coverage**: May 24, 31; June 6-7, 9, 11, 13-14, 25; July 4; between 0530 and 0915 hours. Total man-hours: 14.3. **Census**: Ovenbird, 31 (253, 102); Red-eyed Vireo, 6 (49, 20); Nashville Warbler, 5 (41, 17); Blackburnian Warbler, 5; Black-throated Green Warbler, 4 (33, 13); Yellow-bellied Sapsucker, 2; Black-and-white Warbler, 2; Mourning Warbler, 2; Chestnut-sided Warbler, 1.5; Ruffed Grouse, 1; Blue Jay, 1; Black-capped Chickadee, 1; Red-breasted Nuthatch, 1; Wood Thrush, 1; Hermit Thrush, 1; Veery, 1; Golden-crowned Kinglet, 1; Magnolia Warbler, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Evening Grosbeak, 1; Canada Warbler, 0.5. **Total**: 23 species; 72 territorial males or females (588/km², 238/100 acres). **Remarks**: No nests were located. This year's census indicates a four-year low in the population. Minor changes have occurred in the species composition and associated abundance levels. — GERALD J. NIEMI, Biology Dept., Univ. of Minnesota, Duluth, Minn. 55812.

45. DECIDUOUS—CONIFEROUS SECOND-GROWTH NORTH WOODS. — **Location**: Vermont: Washington Co., SW corner Cabot; 72°23'N, 44°23'W, Plainfield Quadrangle, USGS. **Continuity**: Established 1972, 4 consecutive years. **Size**: 15 ha = 37 acres. **Description of Plot**: See AB 26: 957-8, 1972. **Coverage**: May 2 to June 2; 24 trips, mostly early morning. Total man-hours: 31.5. **Weather**: Unseasonably warm.

Census: White-throated Sparrow, 9.5(63, 26), Ovenbird, 4 (27, 11); Song Sparrow, 3.5 (23, 9); Veery, 3 (20, 8); Com. Yellowthroat, 3; Canada Warbler, 3, Red-breasted Nuthatch, 2; Winter Wren, 2; Nashville Warbler, 2; Chestnut-sided Warbler, 2; Broad-winged Hawk, 1; Ruffed Grouse, 1; Am. Woodcock, 1, Least Flycatcher, 1; Blue Jay, 1; Black-capped Chickadee, 1, Am. Robin, 1; Ruby-crowned Kinglet, 1; Solitary Vireo 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1, Magnolia Warbler, 1; Black-throated Blue Warbler, 1, Yellow-rumped Warbler, 1; Black-throated Green Warbler, 1; Am. Redstart, 1; Am. Goldfinch, 1; Dark-eyed Junco, 1; Com. Flicker, 0.5; Hermit Thrush, 0.5. **Total**: 30 species; 53 territorial males (354/km², 143/100 acres). **Remarks**: Six nests were found: Broad-winged Hawk, Ruffed Grouse, Red-breasted Nuthatch (2), Wood Thrush, Dark-eyed Junco, White-throated Sparrow, woodcock (chicks). about 200 m of the plot were converted from brush to open field; no new species moved in and former residents moved to nearby fence rows. — BARBARA CARPENTER, Marshfield, Vt., 05658.

46. BURNED PINE—OAK FOREST. — **Location**: Massachusetts; Plymouth Co., Pine Hills 0.5 mile S of Rte 3A; 41°56'N, 70°35'W, Manomet Quadrangle, USGS. **Continuity**: New. **Size**: 22.5 ha = 55.6 acres (3 adjacent rectangles each 200 x 375 m with sides running N-S and E-W, surveyed). **Description of Plot**: Almost completely burned by forest fire in 1957, and scheduled for housing development in 1976. The dominant trees in order of density were Black/Scarlet Oak (*Quercus velutina coccinea*) 60%, Red Maple (*Acer rubrum*) 18%, White Oak (*Q. alba*) 14%, Pitch Pine (*Pinus rigida*) 5% and White Pine (*P. strobus*) 3%. Most (93%) were live but some large dead trees persisted and provided opportunities for cavity nesters. Dominant shrub species (1-3 m height), were Black Oak 22%, Red Maple 19%, White Oak 13%, N. Wild Raisin (*Viburnum cassinoides*) 12%, and Scrub Oak (*Q. ilicifolia*) 11%. The shrub layer as a whole was sparse and roughly 1/5 of the shoots were dead. Ground cover was mainly Black Huckleberry (*Gaylussacia baccata*), Early Sweet Blueberry (*Vaccinium vacillans*), Bracken Fern (*Pteridium aquilinum*) and Low Sweet Blueberry (*V. angustifolium*). A survey of 15 random 25 x 25 m plots gave the following results: Black/Scarlet Oak > 3 m live 578/acre, standing dead > 3 m 53/acre, lying dead 18/acre, trunks in clumps of up to 7 together. Average height of live Black/Scarlet Oaks 6.1 m (max 12 m), diameter 7.5 cm (max. 27.3 cm); height of standing dead trunks averaged 4.4 m (max. 9 m), diameter 7.1 cm (max. 14.3 cm). Red Maple > 3 m live 178/acre, standing dead > 3 m 9/acre, lying dead 3/acre, most trunks of this species were in clumps of up to 16 together. Average height of live Red Maples 5.0 m (max. 13 m), average diameter 3.6 cm (max. 14.5 cm). White Oak > 3 m live 135/acre, standing dead 8/acre, lying dead 0, a few clumps of up to 6 trunks. Average height of live White Oaks 6.9 m (max. 13.0), average diameter 7.2 cm (max. 24.8 cm). Pitch Pine > 3 m live 45/acre, standing dead 4/acre, lying dead 3/acre, mainly single trunks. Average height of live Pitch Pines 5.3 m (max. 12 m), average diameter 8.6

cm (max. 15.1 cm). White Pine > 3 m live 23/acre, standing dead 3/acre, lying dead 2/acre, all single trunks Average height of live White Pines 10.3 m (max 16 m), average diameter 23.8 cm (max. 35.5 cm) Mean tree cover was 50%. Within these 15 random plots 15 10 x 10 m samples gave a shrub layer of 164 stems/acre 1-3 m high with an average cover of 10% The herbaceous layer was censused by 75 random 1 m squares; average cover was 32% varying from 4 to 90% **Edge:** The habitat was uniform and similar over the whole ridge, although such trees as the White Pine were in groves rather than scattered randomly. **Topography** Essentially flat; the top of a terminal glacial moraine, although the west end starts to slope more steeply downhill. **Elevation:** 360 ft. **Coverage:** June 16-17, 20, 23, 25, 27, 30; July 2, 7, 9, 11, 15. Total man-hours: 88. **Census:** Rufous-sided Towhee, 12 (53, 22), Ovenbird, 6.5 (29, 12); Whip-poor-will, 3.5 (16, 6), Pine Warbler, 3.5; Blue Jay, 3 (13, 5); Black-capped Chickadee, 3; Black-and-white Warbler, 3; Rufous Grouse, 2.5; Hermit Thrush, 2.5; Com. Flicker, 2; Com. Yellowthroat, 2; Nashville Warbler, 1.5; Mourning Dove, 1; Great Crested Flycatcher, 1; Scarlet Tanager, 1. **Total:** 15 species; 48 territories (213/km², 86/100 acres). **Remarks:** Nests found: 1 Ruffed Grouse, 2 Whip-poor-will, 1 Black-capped Chickadee and 2 Rufous-sided Towhee. The Nashville Warbler has seldom been found breeding in SE Massachusetts in recent years. This census was carried out by 14 people of the Manomet Bird Observatory. Grateful thanks to The Dorr Foundation for a generous grant which helped to support the work. Finally we are particularly indebted to Gordon L. Howland and Christopher Hussey who own the land and have actively supported this study — **TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.**

47. DECIDUOUS—CONIFEROUS LOW-LYING ISLAND. — **Location:** Massachusetts; Plymouth Co., Halfway Pond, off Mast and Wareham Roads; 41°51'N, 70°37'W, Sagamore Quadrangle, USGS. **Continuity:** New Size: 5.06 ha = 12.5 acres (an irregular island in the center of the pond, surveyed). **Description of Plot:** A privately owned island which has never been cut or burned as far as can be ascertained. Trees on the NE corner were felled by the 1944 hurricane, and some damage detectable on the S end was probably a result of the 1938 hurricane. There were five main areas of vegetation (a) Mature mixed woodland on the NW end; dominant trees were Beech (*Fagus grandifolia*) 57% of standing trunks, Red Maple (*Acer rubrum*) 26% E. Hemlock (*Tsuga canadensis*) 5% and Sassafras (*Sassafras albidum*) 4%; although 90% of the trees were alive there were also standing and lying dead trunks in all stages of decay. A survey of 2 random 25 x 25 m plots gave Beech > 3 m in height, live, 314/acre, average height 6.4 m and diameter 5.5 cm, Red Maple > 3 m live 136/acre, average height 14.5 m and diameter 16.9 cm, E. Hemlock > 3 m live 26/acre and Sassafras 10/acre. Mean tree cover was 78%. Two 10 x 10 m samples gave a limited shrub layer (1-3 m), mainly Beech saplings, 182 stems/acre with an average cover of 6%. Ground cover < 1m was almost entirely Canada Mayflower (*Maianthemum canadense*) and average cover was a

sparse 12%. (b) The rest of the N end of the island was covered by a similar forest with more E. Hemlock and White Pine (*Pinus strobus*); dominant trees were Beech 42%, E. Hemlock 20%, Red Maple 16%, White Pine 15% and Yellow Birch (*Betula lutea*) 6%; there were also more dead trees in this area. A survey of 2 random 25 x 25 m plots gave Beech < 3 m live 363/acre, average height 9.5 m and diameter 9.6 cm, E. Hemlock live 172/acre, Red Maple live 120/acre, average height 12 m and diameter 9.9 cm, White Pine live 52/acre (mainly dead), and Yellow Birch 55/acre. Mean tree cover 88%. Number of shrub stems/acre was 180 with a minimal 3% cover, while ground cover averaged 3%, again almost entirely Canada Mayflower. (c) The S end and a grove in the center of the island have a more uniform Beech cover with fewer other species: Beech 47%, Witch Hazel (*Hamamelis virginiana*) 28%, Red Maple 9%, and Tupelo (*Nyssa sylvatica*) 7%; over 95% of these trees were live. A survey of 3 random 25 x 25 m plots gave Beech > 3 m live 300/acre, average height 7.7 m and diameter 11.4 cm, Witch Hazel 179/acre, average height 4.2 m and diameter 4.5 cm, Red Maple 54/acre and Tupelo 45/acre. Mean tree cover 78% Number of shrub stems was 256/acre with only 7% cover while ground cover averaged. (d) An area in the center of the island had much less tree cover and a dense growth of Coast Pepperbush (*Clethra alnifolia*) A 25 m² survey gave dominant trees as Tupelo 43%, Beech 25% and Red Maple 16%. Density gave Tupelo > 3 m live 194/acre, average height 12.8 m and diameter 23.8 cm, Beech 110/acre, average height 7.5 m and diameter 6.6 cm, and Red Maple 71/acre; mean tree cover only 70%. Coast Pepperbush was the dominant species in both shrub and herb layers; shrub cover 35%, 9,430 stems/acre, ground cover 41%. (e) Around the whole island a coastal strip of shrub height vegetation varied from 3-10 m in width and merged in the center with area (d). **Edge:** The island is in the middle of a 232-acre fresh water lake with coniferous/deciduous forest on the shores. **Topography:** Flat and less than 2 m above water level except for a sand and gravel ridge on the S end, (probably of glacial origin), which rises to a maximum of 8 m. **Elevation:** 63 ft. **Coverage:** May 23, 27, 30-31; June 4, 8, 11, 14, 17, 22, 28, 30, July 5, 8, 19. All visits within 1 hour of dawn and averaged 1 hour; one was at night. Total man-hours 82. **Census:** E. Kingbird, 2; Black-capped Chickadee, 2; Gray Catbird, 2; Red-winged Blackbird, 2; Com. Grackle, 2; Blue Jay, 1+; Ruffed Grouse, 1; Green Heron, 1; Com. Flicker, 1; Great Crested Flycatcher, 1 **Total:** 10 species; 15 territories (297/km², 120/100 acres). **Remarks:** As far as is known this small island is a natural habitat and has never been burned or logged It shows a marked contrast to the Pitch/Pine Scrub Oak forest which runs down to the N shore of the lake, and it has several plants not commonly found in this part of SE Mass., e.g. many large examples of American Holly (*Ilex opaca*), Yellow Birch, and numerous E. Hemlocks. This census was carried out by 22 people of the Manomet Bird Observatory. Grateful thanks to The Dorr Foundation for a generous grant which helped to support the work. We are particularly indebted to Mrs Clarence E. Bird for permission to survey her island — **TREVOR L. LLOYD-EVANS, Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.**

48. PITCH PINE—SCRUB OAK FOREST IV.

1-YEAR REGENERATION. — **Location:** Massachusetts; Plymouth Co., off Haven Road, 2 ½ miles ENE of College Pond; 41°53'N, 70°37'W, Manomet Quadrangle, USGS. **Continuity:** New. **Size:** 7.5 ha = 18.53 acres (an irregular right angle polygon with sides running NE-SW and NW-SE, surveyed). **Description of Plot:** Burned by forest fire in May 1974. The dominant (90%) tree was Pitch Pine (*Pinus rigida*), all killed by the fire but with new shoots beginning to grow from the roots in some cases. Scrub Oak (*Quercus ilicifolia*) was the prominent (97%) understory species, and ground cover was predominantly of Scrub Oak seedlings, Bracken Fern (*Pteridium aquilinum*), and Black Huckleberry (*Gaultheria procumbens*). A survey of 5 random 25 x 25 m plots gave the following results: 598 standing dead trees > 1 m/acre, 14 lying dead trees/acre and no live Pitch Pines or seedlings. Average height of standing dead pines > 1 m was 4.3 m (range 1-10 m), diameter 7.3 cm (range 1.9-21.3 cm). Tree cover averaged 5%. Within these 5 random plots 5 10 x 10 m samples gave 5,148 Scrub Oak clumps/acre; average height 87 cm (range 75-100 cm, dead burned branches 175 cm); average cover of Scrub Oak 35%. The herbaceous layer was censused by 25 random 1 m squares; average cover was 29%. **Edge:** Carefully chosen to ensure uniform habitat. **Topography:** Essentially flat. **Elevation:** 180 ft. **Coverage:** 1974: June 7, 11, 18, 20-21, 25; July 2-3, 8, 11, 17. All visits within one hour after dawn and averaged 2 hrs; some were carried on through the day, or at night. Total man-hours: 39.8. **Census, 1974:** Rufous-sided Towhee, 6.5 (87, 35); Hermit Thrush, 3 (40, 16); E. Wood Pewee, 2; E. Bluebird, 2; Com. Flicker, 1; Blue Jay, 1. **Total:** 6 species; 15.5 territories (207/km², 84/100 acres). **Remarks:** Com. Flicker nest found. This plot is one of a series in and around the Myles Standish State Forest which is regenerating from forest fires (see this issue and AB 27: 975-977, 1973). Although the fire in May killed all vegetation, the majority of trees were left standing and the herb and shrub layers put out new shoots to provide adequate nest sites for 9.5 territories of ground-nesting birds. This rapid regeneration of the vegetation, and subsequent recovery of bird populations in the area, is typical of the Pitch Pine-Scrub Oak forests of SE Massachusetts. This census was carried out by 20 people, of the Manomet Bird Observatory. Grateful thanks to the Godfrey M. Hyams Trust for a generous grant which helped to support the work.—TREVOR L. LLOYD-EVANS, *Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.*

49. PITCH PINE—SCRUB OAK FOREST IV.

1-YEAR REGENERATION. — **Location:** Massachusetts; Plymouth Co., off Haven Road, 2 ¼ miles ENE of College Pond; 41°53'N, 70°37'W, Manomet Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 7.5 ha = 18.53 acres. **Description of Plot:** See Census No. 48, above, and note the many changes in the vegetation. Burned by forest fire in May 1974 (one year before this census). The dominant (72%) tree was Pitch Pine (*Pinus rigida*), all killed by the fire but with new shoots beginning to grow from the roots in many cases and reaching heights of circa 2 m. The other

significant trees were Black Oak (*Quercus velutina*) 16%, Gray Birch (*Betula populifolia*) 6% and White Oak (*Q. alba*) 3%. Scrub Oak (*Q. ilicifolia*) was the prominent (94%) understory species, and ground cover was mainly Black Huckleberry (*Gaultheria procumbens*), Wintergreen (*Gaultheria procumbens*) and Early Sweet Blueberry (*Vaccinium vacillans*). A survey of 5 random 25 x 25 m plots gave the following results: 321 standing dead trees > 1 m/acre, 18 lying dead trees/acre, and no live trees or seedlings. Average height of standing dead trees > 1 m was 6.4 m (range 1-11 m), diameter 12.0 cm (range 1.9-24.5 cm). Tree cover average 5%. Within these 5 random plots 5 10 x 10 m samples gave 4379 Scrub Oak clumps/acre; average height 72 cm (range 60-90 cm, dead burned branches 132 cm); average cover of Scrub Oak 41%. The herbaceous layer was censused by 25 random 1 m squares; average cover was 34%. **Edge:** Carefully chosen to ensure uniform habitat. **Topography:** Essentially flat. **Elevation:** 180 ft. **Coverage, 1975:** May 23, 27, 29; June 2, 5, 12, 17, 20, 23, 26; July 3, 10. All visits within one hour after dawn and averaged 2 hours; one was made at night. Total man-hours: 71. **Census, 1975:** Prairie Warbler, 10.5 (140, 57); Rufous-sided Towhee, 7.5 (10, 40), Com. Yellowthroat, 2; House Wren, 1.5; Brown Thrasher, 1.5; E. Bluebird, 1.5; Whip-poor-will, 1+; Com. Flicker, 1; Hairy Woodpecker, 1; E. Wood Pewee, 1; Blue Jay, 1; Chestnut-sided Warbler, 1, Bobwhite, 0.5; Downy Woodpecker, 0.5; Black-capped Chickadee, 0.5; Red-breasted Nuthatch, 0.5; Hermit Thrush, 0.5; E. Kingbird +. **Total:** 18 species, 33 territories (440/km², 178/100 acres). **Remarks:** Nests found: Com. Flicker, E. Bluebird, Prairie Warbler. The new growth after the fire gave vigorous shrub and herb cover as well as dead trees for cavity nests. The 33 territories and 18 species show a rapid recovery from 1974 which showed 15.5 territories and 6 species. This census was carried out by 15 people of the Manomet Bird Observatory. Grateful thanks to The Dorr Foundation for a generous grant which helped to support the work.—TREVOR L. LLOYD-EVANS, *Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.*

50. 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; 9 intermittent years. **Size:** 10.52 ha = 26 acres (roughly a trapezium). **Description of Plot:** See AFN 19: 594-595, 1965. **Coverage:** April 28-29; May 12, 14; June 5, 7-8, 17, 19, 21; from 0300 to 2300, with emphasis before 0600. Total man-hours: 22. **Census** Blackburnian Warbler, 7 (67, 27); Ovenbird, 7; Veery, 6 (57, 23); Black-throated Green Warbler, 6; Wood Thrush, 4 (38, 15); Rufous-sided Towhee, 4; Brown Creeper, 3.5 (33, 13); Blue Jay, 3 (29, 12); Black-capped Chickadee, 3; Solitary Vireo, 3; Red-breasted Nuthatch, 2; Red-eyed Vireo, 2; Black-and-white Warbler, 2; Canada Warbler, 2; Scarlet Tanager, 2; Brown-headed Cowbird, 2; Barred Owl, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Am. Robin, 1; Hermit Thrush, 1; Com. Grackle, 1; Purple Finch, 1; Broad-

winged Hawk, 0.5, Mourning Dove, 0.5, Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5; Gray Catbird, 0.5, N. Oriole, 0.5; Rose-breasted Grosbeak, 0.5; White-throated Sparrow, 0.5; Pileated Woodpecker, +; House Wren, +; Com. Yellowthroat, +; Cardinal, +; Song Sparrow, +. **Total:** 38 species; 71.5 territorial males ($680/\text{km}^2$, 275/100 acres). **Remarks:** Blackburnian Warblers peaked this year at 7. In 1967, there were 2.5, and in recent years they have edged out the Black-throated Green Warbler. Conversely, the Black-throated Green Warbler has been in a steady decline from a high of 11 in 1967 to 3 in both 1973 and 1974, but this year rose to 6. The rise in numbers of both these canopy-feeders reflects the general density rise from 60.5 to 71.5, the greatest density change yet in this very stable plot. The only significant habitat change was the unfortunate removal, for saw-mill purposes, of several softwoods and hardwoods of 125 years growth and younger: the effect of which was similar to an area of windfall. No new birds seemed to move in because of it. — ANDREW MAGEE, *Woollybear Company, Troy N. H. 03465.*

51. UPLAND MIXED PINE—SPRUCE—HARDWOOD PLANTATION. — **Location:** New York, Allegany Co., on the S side of Brown Road, near its intersection with the Vandermark Road, in the town of Ward, 3.5 miles W of Alfred, $42^\circ 7' 30''\text{N}$, $77^\circ 45' \text{W}$; Andover Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 16.6 ha = 41 acres (roughly rectangular; perimeter measured with tape and compass). **Description of Plot:** See AB 28: 699, 1974. **Weather:** See Census 61. **Coverage:** May 1, 10, 15, 26, 29, 31; June 5, 10, 13, 19, 24; July 12, 22-24, 26-27; August 1. Hours varied from 0645 to 2100, EDT, and totaled 25.5 man-hours. **Census:** Black-throated Green Warbler, 10 (5 (63, 26); Magnolia Warbler, 10 (60, 24); Blackburnian Warbler, 8 (48, 20); Golden-crowned Kinglet, 7 (42, 17); Dark-eyed Junco, 6 (36, 15); Blue Jay, 4 (24, 10); Black-capped Chickadee, 4; Red-breasted Nuthatch, 3 (18, 7); Am. Robin, 3; Wood Thrush, 3; Veery, 3; White-throated Sparrow, 3; Hairy Woodpecker, 2; Canada Warbler, 2; Cardinal, 2; Song Sparrow, 2; Yellow-rumped Warbler, 1.5; Com. Yellowthroat, 1.5; Indigo Bunting, 1.5; Cooper's Hawk, 1; Downy Woodpecker, 1; Brown Creeper, 1; Solitary Vireo, 1; Red-eyed Vireo, 1; Ovenbird, 1; Chipping Sparrow, 1; White-breasted Nuthatch, +; House Wren, +; Scarlet Tanager, +; Rose-breasted Grosbeak, +. **Total:** 30 species; 84 territorial males ($506/\text{km}^2$, 205/100 acres). **Remarks:** Cooper's Hawks nested. The Golden-crowned Kinglet population was down from 16 to 7. Appreciation is extended to Robert Place for weather data; Lou Burton for photographic work; and to Clarence Klingensmith and David Brooks for assistance in field work. — ELIZABETH W BROOKS, *Water Wells Rd., Alfred Station, N. Y. 14803.*

52. HEMLOCK—MIXED BIRCH — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mile S of the intersection of state Rte 228 and Kepple Road on Todd Sanctuary; $40^\circ 44' \text{N}$, $79^\circ 42' \text{W}$, Freeport Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 22 ha = 54.3 acres (line transect, measured). **Description**

of Plot. See AB 28: 1014, 1974. **Weather:** Warm, with some rain. **Coverage:** May 23, 31; June 2, 7, 10, 14, 21-22, 25; between 0500 and 0800. Minimum man-hours: 30-35. **Census:** Red-eyed Vireo, 32 (146, 59); Cardinal, 16 (73, 29); Acadian Flycatcher, 10 (46, 18); Wood Thrush, 6 (27, 11); Scarlet Tanager, 6; Tufted Titmouse, 5 (23, 9); Kentucky Warbler, 5; Blue-gray Gnatcatcher, 4.5 (20, 8); Indigo Bunting, 3.5 (16, 6); Louisiana Waterthrush, 3 (14, 6); Black-capped Chickadee, 2.5; Cerulean Warbler, 2.5; Ruffed Grouse, 1, 5; Screech Owl, 1.5; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Blue-Jay, 1; Com. Crow, 1; Carolina Wren, 1; Black-and-white Warbler, 1; Ovenbird, 1; Brown-headed Cowbird, 1; Rufous-sided Towhee, 1; Sharp-shinned Hawk, +; Red-tailed Hawk, +; Great Horned Owl, +; Barred Owl, +; Belted Kingfisher, +; Am. Robin, +. **Total:** 31 species, 106 5 territorial males or females ($485/\text{km}^2$, 196/100 acres)

Remarks: The large apparent increase in Red-eyed Vireos and Cardinals can mostly be attributed to a more careful survey. Wood Thrush, Scarlet Tanager, Acadian Flycatcher, Kentucky Warbler, Blue-gray Gnatcatcher showed a slight increase. Ruffed Grouse and Brown-headed Cowbird decreased. Ovenbird, Great Horned Owl, and Barred Owl were new species. Downy Woodpecker and E. Phoebe were absent this year. Nests found: Acadian Flycatcher, 1; Com. Crow, 1; Wood Thrush, 1. I thank Rupert Friday and Chuck Bier for their help with this study. — G. THOMAS BANCROFT, *RD 3, Cedar Run Road, Allison Park, Pa 15101.*

53. MOUNTAIN TOP, MIXED HARDWOOD—WHITE PINE FOREST. — **Location:** Pennsylvania, Westmoreland Co., 10 miles SSW of Ligonier, 6 miles S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; $40^\circ 07' 18''\text{N}$, $79^\circ 10' 47''\text{W}$, Bakersville Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 6.07 ha = 15 acres (rectangular, 330 x 1980 measured). **Description of Plot:** See AB 28: 1014, 1974. **Weather:** 2 days cold, rain and windy, 2 days cool and clearing, 2 days warm and clear. **Coverage:** June 7-10, 14-15. Hours: 0500 to 0930, 1200 to 1300, and 1700 to 1930. Total party-hours: 18 $\frac{3}{4}$. **Census:** Red-eyed Vireo, 4.5 (74, 30); Canada Warbler, 4 (66, 27); Dark-eyed Junco, 3.5 (58, 23); Veery, 3; Rufous-sided Towhee, 3; Solitary Vireo, 2.5; Ovenbird, 2.5; Black-throated Blue Warbler, 1.5; Com. Yellowthroat, 1.5; Scarlet Tanager, 1.5; Black-capped Chickadee, 1; Brown Creeper, 1; Hermit Thrush, 1; Black-throated Green Warbler, 1; Wood Thrush, 0.5; Hairy Woodpecker, +; Blue Jay, +; Gray Catbird, +; Magnolia Warbler, +; Chipping Sparrow, +. **Total:** 20 species; 32 territorial males ($527/\text{km}^2$, 213/100 acres) — R. CARRELL ABBOTT, *Audubon Society of Western Pennsylvania, Carnegie Museum, Pittsburgh, Pa 15213.*

54. HEMLOCK—TULIP-TREE FOREST. — **Location:** West Virginia; Raleigh Co., part of Little Beaver State Park; $37^\circ 45' 18''\text{N}$, $81^\circ 04' 26''\text{W}$, Prince Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (measured longitudinally and estimated later-

ally) **Description of Plot.** The dominant canopy trees are Hemlock (*Tsuga canadensis*) and Tulip-tree (*Liriodendron tulipifera*). Most prominent in the understory is *Rhododendron maximum*. The sparse ground cover is primarily Wood Sorrel (*Oxalis montana*) and Com Cinquefoil (*Potentilla simplex*). A quantitative survey of the vegetation gave the following results: Trees 3-inches in diameter and over, based on six circular samples, 396/acre; total basal area 268.7 ft²/acre. Species comprising 92.2% of the total number of trees: Hemlock, 142, 36, 36, 100; Tulip-tree, 33, 8.5, 16, 83; Red Maple (*Acer rubrum*), 33, 8.5, 6, 83; White Pine (*Pinus strobus*), 17, 4.2, 8.7, 67; White Oak (*Quercus alba*), 27, 6.8, 7.2, 67; dead trees, 27, 6.8, 2.4, 67; Black Birch (*Betula lenta*), 25, 6.4, 1.6, 67; Rhododendron, 15, 3.8, 0.6, 33; Black Oak (*Q. velutina*), 13, 3, 4, 67; Chestnut Oak (*Q. montana*), 10, 2.5, 0.7, 50; Red Oak (*Q. rubra*), 10, 2.5, 9.2, 50; Mountain Magnolia (*Magnolia fraseri*), 10, 2.5, 2.2, 50. Trees by diameter size class: A (3-6 in.) 148, 37, 14, 7, 5.5; B (6-9 in.) 103, 26.1, 31, 11.6; C (9-15 in.) 75, 19, 60, 22.4; D (15-21 in.) 53, 13.5, 95, 33.5; E (21-27 in.) 12, 3, 36.2, 13.5; F (27-33 in.) 2, 0.4, 8.2, 3, G (33-40 in.) 3, 0.8, 23.6, 8.8. Shrub stems/acre 4058, ground cover 10%; canopy cover 92%; average canopy height 92 ft (range 55-118 ft). **Edge:** Uniform and similar within the confines of the plot and beyond; however, there are some open areas about 100 yards beyond the longitudinal edge, on each side. **Topography** A forested ravine along a small stream, extending SSE, with very little change in elevation. There is a gently rising slope along one side of the ravine. **Elevation** 2530 ft. **Weather:** Foggy in the mornings and clearing as the sun reached the area. **Coverage:** June 1-4, between dawn and 0730, or 0930 and 1130 hours. Total party-hours: 13. **Census:** Wood Thrush, 4 (66, 27); Solitary Vireo, 3.5 (58, 23); Red-eyed Vireo, 2.5; Acadian Flycatcher, 2; Black-and-white Warbler, 2; Rose-breasted Grosbeak, 2; Hooded Warbler, 1.5; Blue Jay, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; Gray Catbird, 1; Am. Robin, 1; Louisiana Waterthrush, 1; Scarlet Tanager, 1; Cardinal, 1; Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5; House Wren, 0.5; Indigo Bunting, 0.5; Rufous-sided Towhee, 0.5; Red-shouldered Hawk, +; Barred Owl, +; Com. Crow, +; White-breasted Nuthatch, +; Field Sparrow, +. **Total** 25 species; 28 territorial males (461/km², 187/100 acres). **Remarks:** Nests found: Red-shouldered Hawk, Am. Robin. The area had been timbered for oaks and other useable hardwoods around the turn of the century, and the old roadbed was used for the center line. A power cable and an old lane crossed the area about midway. It is assumed that the presence of these interruptions in the ravine habitat and the nearness of open areas near the edges accounted for some of the birds such as the House Wren, catbird, bunting and sparrow. — ELIZABETH DeGARMO and E. R. CHANDLER, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. V. 26003.

and extends S. **Continuity.** New. **Size.** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot** The dominant trees are many small White Oak (*Quercus alba*), several larger Scarlet Oak (*Q. coccinea*), and a few large White Pine (*Pinus strobus*). The Scarlet Oak and White Pines are the remnants of the previous forest before being logged and burned over about 1945. The understory is mostly Mountain Laurel (*Kalmia latifolia*), Flame Azalea (*Rhododendron calendulaceum*), and seedlings of the canopy trees. The ground cover is quite varied and includes ferns, grasses, sedges, and a number of evergreen herbs such as *Galax aphylla*, Teaberry (*Gaultheria procumbens*), and Heartleaf (*Asarum virginicum*). A quantitative vegetation survey of six 0.1 acre samples shows: Trees 3-inches diameter and over, 456/acre; total basal area 104.2 ft²/acre. Species comprising 98% of the total number of trees: White Oak, 332, 73, 48, 100; Scarlet Oak, 27, 6, 16, 100; Red Oak (*Q. rubra*), 13, 3, 3, 67, White Pine, 8, 2, 22, 33; Red Maple (*Acer rubrum*), 17, 4, 3, 67; Tulip-tree (*Liriodendron tulipifera*), 8, 2, 3, 50; Sourwood (*Oxydendrum arboreum*), 18, 4, 2, 50, dead trees, 17, 4, 2, 67. Trees by diameter size class A (3-6 in.) 345, 76, 34.5, 33; B (6-9 in.) 77, 17, 23, 22, C (9-15 in.) 25, 6, 20, 19; D (15-21 in.) 2, 0, 3, 3, E (21-27 in.) 5, 1, 15.5, 15; F (27-33 in.) 2, 0, 8 2, 8 Shrub stems/acre 3500; ground cover 53%; canopy cover 78%; average canopy height 54 ft (range 40-95) **Edge:** The forest continues on all sides. **Topography** Relatively level. The centerline starts at 2320 ft and slopes down to 2300 ft. Level to west where a small stream flows within the plot for its full length. Maximum rise to east is about 15 ft in the 165 ft **Weather:** Rather warm for this elevation. Over 60°F each morning (except for one very foggy morning) quickly warming to about 80° in afternoon. **Coverage** June 1-4; 12 trips between daylight and 0740 and 2 trips in the late evening. Total party-hours: 9. **Census** Ovenbird, 6 (99, 40); Black-and-white Warbler, 3 (49, 20); Tufted Titmouse, 2; Red-eyed Vireo, 2; Acadian Flycatcher, 1; Blue Jay, 1; Carolina Chickadee, 1; Scarlet Tanager, 1; Rufous-sided Towhee, 1; Am. Robin, 0.5; Wood Thrush, 0.5; Downy Woodpecker, +; Great Crested Flycatcher, +; Com. Crow, +; Hooded Warbler, +; Com. Grackle, +; Brown-headed Cowbird, + **Total:** 17 species; 19 territorial males (313/km², 127/100 acres). **Remarks:** We did not realize the amount of motorcycle and motor scooter traffic that would be on the jeep trails and paths. The birds seemed to shun the trail and path that the centerline followed. Few birds were seen and most of the singing was near the edge of the plot. — GEORGE KOCH (compiler), SHARON and MIKE WILLIAMS, ANN PYLE, EUGENE HUTTON, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

56. COASTAL MIXED PINE—OAK FOREST. —

Location: North Carolina; Brunswick Co., in Pinner's Point, Long Beach on Oak Island, 10 miles W of Southport; 33°55'N, 78°10'W, Lockwoods Folly Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size:** 19.2 ha = 47.5 acres (rectangular, surveyed with hand compass in units of 45.73 x 45 733

m, sectioned into lots for development as part of the city of Long Beach). **Description of Plot:** See AB 27: 978-979, 1973 and 28: 1015, 1974. **Weather:** Cool, wet, with strong winds. **Coverage:** April 24, 28; May 2, 12, 16, 22, 26, 30; June 5, 19; July 1; between 0543 and 1032, EST. Total man-hours: 61.6. **Census:** Great Crested Flycatcher, 8.5 (44, 18); Cardinal, 8 (42, 17); Red-bellied Woodpecker, 5 (26, 11); Tufted Titmouse, 5, Carolina Wren, 5; Blue Jay, 4 (21, 8); Bobwhite, 3 (16, 6); Painted Bunting, 3; Rufous-sided Towhee, 2.5 (12, 5); Mourning Dove, 2; Yellow-billed Cuckoo, 2; Com Flicker, 2; Red-headed Woodpecker, 2; Downy Woodpecker, 2; Carolina Chickadee, 2; Mockingbird, 2, Brown Thrasher, 2; Summer Tanager, 2; Ground Dove, 1; Pileated Woodpecker, 1; Blue-gray Gnatcatcher, 1; Pine Warbler, 1; Prairie Warbler, 1; Orchard Oriole, 1; Chuck-will's-widow, 0.5. **Total:** 25 species; 68 5 territorial males or females ($356/\text{km}^2$, 144/100 acres). **Remarks:** Great Crested Flycatchers and Cardinals were again our most abundant breeding species; towhees increased significantly, while nesting vireos disappeared. Hairy Woodpeckers were observed in the area with young. There were three new summer cottages, making a total of 15. — SAMUEL R. and ISABEL H. TIPTON, 113 W. 23rd St., Long Beach, Southport, N. C. 28461.

57. MIXED PINE—HARDWOOD FOREST.—
Location: Texas; Angelina Co., Angelina College Property, 1.6 miles S of intersection of Loop 287 and U S 59; $31^{\circ}17'34''\text{N}$, $94^{\circ}44'1''\text{W}$, Lufkin Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 6.32 ha = 15.6 acres (irregular, 862.5 x 787.5 ft, laid out with compass, steel tape, and level). **Description of Plot:** See AB 28: 1016, 1974. **Weather:** Five of the 11 dates had overcast skies but no precipitation; the remaining had clear to partly cloudy skies. Rainfall during the first six months was slightly below normal. Temperatures ranged from 35° to 78°F . **Coverage:** March 15, 21, April 3, 11, 19; May 2, 11, 16, 26; June 6, 13; between 0700-0930 hours with an average of 60 minutes per trip. Total man-hours: 10. **Census:** Cardinal, 10 (158, 64); White-eyed Vireo, 7 (111, 45); Carolina Wren, 4 (63, 26); Blue Jay, 3, (48, 19); Carolina Chickadee, 3; Tufted Titmouse, 3; Swainson's Warbler, 2; Hooded Warbler, 2; Red-eyed Vireo, 1; Kentucky Warbler, 1; Brown-headed Cowbird, +. **Total:** 11 species; 35 territorial males or females ($554/\text{km}^2$, 224/100 acres). **Remarks:** No nests were located but Cardinal and White-eyed Vireo fledglings were seen on two different occasions. Three new species added to the list of probable nesters were Blue Jay, Red-eyed Vireo, and Brown-headed Cowbird. Absent from last year's group were Yellow-billed Cuckoo, Downy Woodpecker, N. Parula and Summer Tanager. — CARROLL MOORE and LOUIS DEBETAZ (compiler), *Science Division, Angelina College, Lufkin, Tex. 75901.*

58. TAMARACK—WHITE CEDAR SLOUGH.—
Location: Ontario; Norfolk Co., Port Rowan, 2 miles W of Long Point Lighthouse; $42^{\circ}33'\text{N}$, $80^{\circ}05'\text{W}$, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** Established 1973; 3 consecutive years. **Size:** 6.07 ha = 15 acres (rectangular, laid out in 0.5 acre squares with

compass and measured rope, roughly 750 x 100 yds) **Description of Plot:** See AB 28: 1017-1018, 1974 **Edge:** The W and N edges border on similar habitat. The S edge borders on fairly open sand dunes and the E edge on a large pond with open water. **Topography:** Flooded forested ridges with open standing water between; the result of several years of high water levels **Elevation:** 575 ft. **Weather:** Generally sunny and warm with light winds. **Coverage:** May 31; June 4, 7, 10, 13, 16, 21, 24, 27; July 1, 5; between 0545 and 1300, EST Total man-hours: 62. **Census:** Red-winged Blackbird, 8 (132, 53); Com. Grackle, 6 (99, 40); N. Oriole, 5 5 (91, 37); House Wren, 4.5 (74, 30); E. Kingbird, 4 (66, 27); Yellow Warbler, 4; Black-capped Chickadee, 3 (49, 20); Chipping Sparrow, 3; Song Sparrow, 3, E Wood Pewee, 2; Tree Swallow, 2; Cardinal, 2, Gray Catbird, 1.5; Mallard, 1; Am. Woodcock, 1; Yellow-billed Cuckoo, 1; Great Crested Flycatcher, 1, Am Robin, 1; Starling, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Com. Yellowthroat, 0.5; Blue Jay, +, Brown Thrasher, +. **Total:** 24 species; 57 territorial males ($939/\text{km}^2$, 380/100 acres). **Remarks:** Nests located (26): Red-winged Blackbird, 8; E. Kingbird, 4, N. Oriole, 4; E. Wood Pewee, 2; Tree Swallow, 2, Am Robin, 1; Starling, 1; Yellow Warbler, 1; Com Grackle, 1; Chipping Sparrow, 1; Song Sparrow, 1 There was a substantial density increase over last year, from $642/\text{km}^2$, 260/100 acres to $939/\text{km}^2$, 380/100 acres. Special thanks to Gary Miller for his direction and to Pamela Roy and Tim Terrio for their assistance — JON D. McCracken, *Long Point Bird Observatory, Port Rowan, Ont. NOE 1M0. Canada.*

59. WHITE PINE—WHITE CEDAR FOREST.—
Location: Ontario, Norfolk Co., Port Rowan, 3.5 miles W of Long Point Lighthouse; $42^{\circ}32'56''\text{N}$, $80^{\circ}01'0''\text{W}$, Gravelly Bay, Dept. of Energy, Mines and Resources, Ottawa. **Continuity:** Established 1973, 3 consecutive years. **Size:** 4 ha = 10 acres (laid out in 0.5 acre squares with compass and measured rope) **Description of Plot:** See AB 28: 1018-1019, 1974 **Weather:** Generally sunny and warm with a light breeze. **Coverage:** June 1, 4, 8, 11, 14, 17, 22, 25, 29, July 2; between 0600 and 1100, EST. Total man-hours 38. **Census:** House Wren, 5 (124, 50); Black-capped Chickadee, 3 (74, 30); Rufous-sided Towhee, 2; Chipping Sparrow, 2; Field Sparrow, 2; Mallard, 1, E Kingbird, 1; Blue Jay, 1; Gray Catbird, 1; Magnolia Warbler, 1; Red-winged Blackbird, 1; Cardinal, 1, Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5, Indigo Bunting, 0.5; Hairy Woodpecker, +; Com Grackle, +. **Total:** 17 species; 22.5 territorial males ($556/\text{km}^2$, 225/100 acres). **Remarks:** Nests located (5) Hairy Woodpecker, 1; House Wren, 1; Cardinal, 1, Field Sparrow, 2. A family of Mallards was also seen on several occasions. Special thanks to Gary Miller for his direction and to Pamela Roy and Tim Terrio for their assistance. — JON D. McCRAKEN, *Long Point Bird Observatory, Port Rowan, Ont. NOE 1M0. Canada.*

60. SCOTCH PINE PLANTATION.—
Location: New York; Chautauqua Co.; 0.72 mile SE of Route 5 and Van Buren Road intersection on Fredonia Airport

property, 42°26'20"N, 79°23'24"W, Brocton Quadrangle, USGS. **Continuity:** New. **Size:** 5.26 ha = 13 acres (rectangle surveyed). **Description of Plot:** The 25-year-old pine plantation is composed almost entirely of Scotch Pine (*Pinus sylvestris*), with some Red Pine (*P. resinosa*) and European Larch (*Larix decidua*) scattered throughout. Broad-leaved trees reaching canopy height are rare. The shrub layer (woody plants 15 in. tall and 1 in. dbh) is dominated by S. Arrowwood (*Viburnum dentatum*). The sparse ground cover is primarily Poison Ivy (*Rhus radicans*) and hawkweed (*Hieracium* sp.). On the basis of a count of the total number of trees, there are 136 trees per acre. The trees are all relatively the same size; the average dbh being 4.3 in. Based on three 6.6 x 33.3 ft belt transects, S. Arrowwood, Green Ash (*Fraxinus pennsylvanica*), Red Maple (*Acer rubrum*), and Poison Ivy comprise 90% of the total number of shrubs. Shrub stems/acre 4,298; canopy cover 95-100%; average canopy height 43.0 ft.

Edge: Bordered on three sides by shrub and open field communities and by shrub and hardwoods forest on the remaining side. **Topography:** Level. **Elevation:** 620 ft. **Weather:** Moderate, no rain on census mornings. **Coverage:** May 15, 18, 20; June 6, 9, 14, 18; between 0545 and 0800 and one trip 2015 to 2145. Total man-hours: 11.1. **Census:** Wood Thrush, 3 (57, 23); Cardinal, 1.5; Green Heron, 1; Blue Jay, 1; Black-capped Chickadee, 1; Com. Grackle, 1; Song Sparrow, 0.5. **Total:** 7 species; 9 territorial males (171/km², 69/100 acres). **Remarks:** Hatched Green Heron eggs found under thick canopy. Nests located: Wood Thrush, 1; Com. Grackle, 2. Special thanks to Joe McMullen for the quantitative habitat description. This census was funded as part of a larger study by Niagara-Mohawk Power Corporation. — ROY S. SLACK, HARRY E. SLACK III, and PAUL G. KALKA, Environmental Analysts Inc., 333 Crossways Park Drive, Woodbury, N.Y. 11797.

61. UPLAND SCOTCH PINE PLANTATION. — **Location:** New York; Allegany Co., 2 miles WSW of Alfred, bordering on the W side of Lake Road, adjacent to the evergreen plantings on the E side of Foster Lake; 42°7'30"N, 77°45'W, Andover Quadrangle, USGS. **Continuity:** Established 1969: 7 consecutive years. **Size** Approximately 9.3 ha = 23 acres (roughly rectangular; 1881 ft in length, varying in width from 209 ft at the north end to 627 ft at the south end, measured with tape and compass, and divided into one-acre plots). **Description of Plot:** See AFN 23: 743-744, 1969. Last fall, approximately 2000 trees were harvested. Many of the pines remaining on the plantation are now too tall or misshapen for use as Christmas trees. There is more open space between trees with increased growth of brambles and Choke Cherry and the stubs left after the pines are cut are sending up second growth. **Weather:** Data provided by the Alfred Cooperative Weather Station indicated that both rainfall and mean daily temperatures in May and June were considerably higher than the 57-year averages. (In the following data, the 57-year averages are given in parentheses.) Temperature: May 59.84°F (49.83°); June 64.6° (60.55°); Rainfall: May 6.34 in. (3.64 in.); June 5.53 in. (3.76 in.). **Coverage:** April 28; May 9, 14, 17,

22, 28, June 7, 15, 18, 23, July 15, 23, 28, between 0915 to 2045, EDT. Total man-hours: 16. **Census:** Song Sparrow, 23 (247, 100); Chipping Sparrow, 19 (204, 83); Am. Robin, 7.5 (81, 33); Com. Yellowthroat, 6 (64, 26); Field Sparrow, 6; Purple Finch, 4 (43, 17); Am. Woodcock, 3 (32, 13); Cedar Waxwing, 3; Yellow-rumped Warbler, 3; Brown-headed Cowbird (females), 2; Rufous-sided Towhee, 2; Tree Swallow, 1; Alder Flycatcher, +; Bobolink, +. **Total** 14 species; 79.5 territorial males (854/km², 346/100 acres). **Remarks:** Nests found: Tree Swallow, 1, Am. Robin, 6; Cedar Waxwing, 2; Com. Yellowthroat, 2, Purple Finch, 2; Chipping Sparrow, 4; Song Sparrow, 1. This year's total of 79.5 territorial males is the lowest in 7 years. There was a 25% decrease in robins and an 18% decrease in Song Sparrows. Appreciation is extended to Robert Place for weather data, and to Eddy Foster for permission to conduct this study on his land — ELIZABETH W. BROOKS, Water Wells Rd., Alfred Station, N.Y. 14803.

62. WHITE PINE PLANTATION. — Location

Massachusetts; Plymouth Co., Myles Standish State Forest, 1.5 miles NE of College Pond; 41°53'N, 70°38'W, Plymouth Quadrangle, USGS. **Continuity:** New. **Size:** 7.5 ha = 18.53 acres (an irregular right angle polygon with sides running NE-SW and NW-SE, surveyed). **Description of Plot:** Planted 1933-35 (40 years old ± 1 year (Myles Standish S.F. records). The dominant (67%) tree was White Pine (*Pinus strobus*) (52% live, 15% standing dead), with Pitch Pine (*P. rigida*) as subdominant (33% all standing dead). The shrub layer was composed of live Scrub Oak (*Quercus ilicifolia*) (9), and Dwarf Oak (*Q. prinoides*) (6%). Ground cover was predominantly Early Sweet Blueberry (*Vaccinium corymbosum*) with Black Huckleberry (*Gaultheria shallon*) and Low Sweet Blueberry (*V. angustifolium*). A survey of 5 random 25 x 25 m plots gave the following results: White Pine 1 m standing dead 343/acre, lying dead 58/acre and no seedlings. Average height of standing dead Pitch Pines 6.3 m (range 1.0-12.0 m), diameter 11.6 cm (range 3.5-29.3 cm). Mean tree cover was 61%. Within these 5 random plots, five 10 x 10 m samples gave a shrub layer of 64 clumps/acre, circa 1.5 m high with an average cover of 5%. The herbaceous layer was censused by 25 random 1 m squares; average cover was 4%. **Edge:** Carefully chosen to insure uniform habitat. **Topography:** Essentially flat. **Elevation:** 160 ft. **Coverage:** 1974, May 28-29; June 4, 6, 10, 13, 18, 2, 28, July 1-2. Total man-hours: 33.5. **Census:** Ovenbird, 4 (53, 22); Rufous-sided Towhee, 2.5; Black-capped Chickadee, 2; Blue Jay, 1; Hermit Thrush, 1; Fish Crow, 0.5; Com. Grackle, 0.5. **Total:** 7 species, 11.5 territories (153/km², 62/100 acres). **Remarks:** An Ovenbird nest was found and newly fledged young of Blue Jay and Com. Grackle were seen. This plantation showed a lower density of territories than any of the natural Pitch Pine/Scrub Oak census plots around it, including one burned in the May of the census year. This census was carried out by 20 people of the Manomet Bird Observatory. Grateful thanks to them and also to the Godfrey M. Hyams Trust for a generous

grant which helped to support the work. — TREVOR L LLOYD-EVANS, *Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.*

63. RED PINE PLANTATION. — **Location:** Massachusetts; Plymouth Co., Myles Standish State Forest, 2 miles ENE of College Pond; 41°52'N, 70°38'W, Wareham Quadrangle, USGS. **Continuity:** New. **Size:** 3 ha = 7.41 acres (an irregular right angle polygon with sides running N-S and E-W, surveyed). **Description of Plot** Planted 1930-1935 making it circa 40 years old, (Myles Standish S.F. records). The dominant (89%) tree was Red Pine (*Pinus resinosa*) (8 live, 8% standing dead), with Pitch Pine (*P. rigida*) as subdominant (11%, 9% standing dead and 2% live). The shrub layer was composed of live Scrub Oak (*Quercus ilicifolia*) (71%), and Dwarf Oak (*Q. prinoides*) (29%) with a living dead ratio of 8:2. Ground cover was predominantly Black Huckleberry (*Gaultheria procumbens*) with Bracken Fern (*Pteridium aquilinum*), Wintergreen (*Gaultheria procumbens*) and Early Sweet Blueberry (*Vaccinium vacillans*). A survey of 5 random 25 x 25 m plots gave the following results: Red Pine > 1 m live 834/acre, standing dead > 1 m 87/acre, lying dead 18/acre, no seedlings. Average height of live Red Pines 10.4 m (range 0.8-16.0 m), diameter 14.4 cm (range 1.4-24.6 cm); average height of standing dead Red Pines 4.9 m (range 1.0-13.5 m), diameter 6.3 cm (range 2.9-15.6 cm). Pitch pine > 1 m live 18/acre, standing dead > 1 m 98/acre, lying dead 14/acre and seedlings 809/acre. Average height of live Pitch Pines 8.2 m (range 1.4-12.0 m), diameter 18.5 cm (range 4.1-22.9 cm); height of standing dead Pitch Pines 4.2 m (range 1.0-9.0 m), diameter 8.3 cm (range 5.6-14.3 cm) Mean tree cover was 43%. Within these 5 random plots 5 10 x 10 m samples gave a shrub layer of 44 clumps/acre; circa 1.5 m high with an average cover of < 5% The herbaceous layer was censused by 25 random 1 m squares; average cover was 18%. **Edge:** Carefully chosen to insure uniform habitat. **Topography:** A uniform 10° slope rising to the W. **Elevation:** 150 ft. **Coverage, 1974:** June 4, 7, 10, 13, 18, 21, 24-25, 27; July 1, 11; August 2. All visits within 2 hours after dawn and average 1 hour; some were carried on through the day or at night. Total man-hours: 19.0. **Census, 1974** Ovenbird, 2; Rufous-sided Towhee, 2; Blue Jay, 1; Black-capped Chickadee, 0.5; Hermit Thrush, 0.5. **Total 5 species; 6 territories (200/km², 81/100 acres).** **Remarks:** This plantation showed a lower density of territories and fewer species of birds than any of the natural Pitch Pine/Scrub Oak census plots around it, including one burned in May of the census year. Results are very similar to those in the nearby White Pines Plantation (Census No. 62). This census was carried out by 20 people of the Manomet Bird Observatory. Grateful thanks to the Godfrey M. Hyams Trust for a generous grant which helped to support the work. — TREVOR L. LLOYD-EVANS, *Manomet Bird Observatory, Box 0, Manomet, Mass. 02345.*

64. ASPEN CLEAR-CUT. — **Location:** Minnesota; St Louis Co., 6 miles N of Island Lake Reservoir Bridge at intersection of Old County Highway 4 and Carroll Truck Trail; 47°6'30"N, 92°6'30"W,

Thompson Lake Quadrangle, USGS. **Continuity** Established 1974. **Size:** 7.5 ha = 18.53 acres (rectangular, 250 x 300 m, measured by compass and calibrated wire). **Description of Plot:** See AB 28: 1021, 1974 **Weather:** Temperature, 45° to 66°F. Wind from Beaufort 0 to 2; clear to overcast with no precipitation **Coverage:** May 24, 31; June 7, 9, 11, 13, 25; July 4, between 0550 and 0930 hours. Total man-hours 10 **Census:** Mourning Warbler, 10 (133, 54); White-throated Sparrow, 9 (120, 49); Song Sparrow, 6 (80, 32); Chestnut-sided Warbler, 4.5 (60, 24); Com. Yellowthroat, 3 (40, 16); Wilson's Snipe, 2; Am. Woodcock, 1; Com. Flicker, 1; Tree Swallow, 1; Am. Robin, 1; Swamp Sparrow, 1. **Total:** 11 species; 39.5 territorial males or females (527/km², 213/100 acres) **Remarks:** Nests: Song Sparrow, 2; Am. Robin, 1. There was a large increase in the population from 25 territorial males last year. Most significant increases were noted in the Mourning Warbler and White-throated Sparrow. — GERALD J. NIEMI, *Biology Dept., Univ of Minnesota, Duluth, Minn. 55812.*

65. BURNED JACK PINE RIDGE I. — **Location** Minnesota; St. Louis Co., 22 miles E of Buyck and 1.5 miles N of Echo Trail in 1971 Little Sioux forest fire area; NE 1/4-NW 1/4, Sect. 31, T66N, R14W, Shell Lake Quadrangle, USGS. **Continuity:** Established 1973, 2 intermittent years. **Size:** 9 ha = 22.24 acres (same proximal area as AB 27: 987-8, 1973 but slightly smaller, 300 x 300 m, 36 50 x 50 m individual plots measured by calibrated wire and compass). **Description of Plot:** The dominant canopy trees are all dead, charred and sparsely distributed. The more prominent understory is composed of Quaking Aspen (*Populus tremuloides*), Pin Cherry (*Prunus pensylvanica*) and Beaked Hazel (*Corylus cornuta*). The ground cover is primarily Bracken (*Pteridium aquilinum*), Large-leaf N Aster (*Aster macrophyllus*), Yellow Clintonia (*Clintonia borealis*), and Raspberry (*Rubus* sp.). A quantitative survey of the vegetation gave the following results Trees 3-inches diameter and over, based on 61 circular samples, 44/acre; total basal area 17.6 ft²/acre. Species comprising 90% of the total number of trees: Burned Jack Pine (*Pinus banksiana*), 12, 27, 18, 39; burned aspen (*Populus* sp.), 9, 20, 52, 36; burned maple (*Acer* sp.), 8, 18, 12, 46; burned Paper Birch (*Betula papyrifera*), 6, 14, 12, 26; burned fir, 6, 14, 4, 23. Trees by diameter size class: A (3-6 in.) 20, 45, 2, 11; B (6-9 in.) 15, 34, 4.4, 25; C (9-15 in.) 8, 18, 6.7, 38, D (15-21 in.) 2, 5, 3.2, 18. Shrub stems/acre 48,503, ground cover 57%; canopy cover, 10%; average canopy height 35 ft; average shrub height 6.1 ft. **Edge:** Bordered on all sides by similar area except for the SE portion which is bordered by a small woodland swamp and to the NW by a small unburned patch of aspen **Topography:** Elevation 1340 ft with a local slope of ± 30 ft. **Weather:** Temperature from 50° to 68°F. Wind, Beaufort 0-3. Clear to overcast, but no precipitation **Coverage:** June 16-19; 21-24; between 0515 and 1030 hours. Total man-hours: 10.75. **Census:** Chestnut-sided Warbler, 8 (89, 36); Mourning Warbler, 7 (78, 31); White-throated Sparrow, 6 (67, 27); Song Sparrow, 5 (56, 22); House Wren, 3 (33, 13); Red-eyed Vireo, 1, 5; Com. Nighthawk, 1; Ruby-throated Hummingbird, 1,

Com Flicker, 1; Red-headed Woodpecker, 1; E. Kingbird, 1; Alder Flycatcher, 1; Least Flycatcher, 1; Tree Swallow, 1; Blue Jay, 1; Veery, 1; Cedar Waxwing, 1; Com. Yellowthroat, 1; Com. Grackle, 1; Indigo Bunting, 1; Am. Goldfinch, 1. **Total:** 21 species; 45 territorial males or females ($500/\text{km}^2$, 202/100 acres).

Remarks: Nests located: Com. Nighthawk, 1; Com. Flicker, 1; Red-headed Woodpecker, 1; Mourning Warbler, 1. The plot shows an unusually high diversity for a recently burned area. This may have been owing to the small woodland pond which seemed to attract a wide variety of species. Funding was provided by a cooperative agreement between the University of Minnesota and the North Central Forest Experiment Station, Project Number 13-420. — GERALD J. NIEMI, *Biology Dept., Univ. of Minnesota, Duluth, Minn. 55812.*

66. BURNED JACK PINE RIDGE II. — Location: Minnesota; St. Louis Co., 22 miles E of Buyck and 2.5 miles N of Echo Trail in 1971 Little Sioux forest fire area, $48^\circ 10' 30''\text{N}$, $92^\circ 10' 30''\text{W}$, Shell Lake Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 18 ha = 44.5 acres (rectangular, 300 x 600 m, 50 x 50 m individual plots extended from 13.5 ha in 1974 by compass and calibrated wire). **Description of Plot:** The vegetation was extensively re-surveyed (AB 28: 1016, 1974). The dominant canopy trees are composed almost entirely of dead, charred Jack Pine (*Pinus banksiana*) snags. Most prominent in the understory are Pin Cherry (*Prunus pensylvanica*), Quaking Aspen (*Populus tremuloides*), Red Maple (*Acer rubrum*), Jack Pine, Sweet Fern (*Comptonia peregrina*) and Beaked Hazel (*Corylus cornuta*). The ground cover is mainly Blueberry (*Vaccinium* sp.), Wintergreen (*Gaultheria procumbens*) and Large-leaf N. Aster (*Aster macrophyllus*). A quantitative survey of the vegetation gave the following results: Trees 3-inches in diameter and over, based on 127 circular samples, 154/acre; total basal area $42.1 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Burned Jack Pine, 87, 56, 72, 96; burned fir, 50, 32, 18, 85; burned Paper Birch (*Betula papyrifera*), 7, 4, 3, 31. Trees by diameter size class: A (3-6 in.) 66, 43, 6.6, 16; B (6-9 in.) 72, 46, 21.5, 51; C (9-15 in.) 17, 11, 13.2, 31. Shrub stems per acre: 48, 322, ground cover 49%; canopy cover 13%; average canopy height 45 ft (range 30-54); average shrub height 4.6 ft. **Weather:** Temperature from 52° to 65°F . Wind, Beaufort 0 to 3. Clear to fully overcast, but no precipitation. **Coverage:** June 16-19, 21-24; between 0550 and 1010 hours. Total man-hours: 15.75. **Census:** White-throated Sparrow, 24 (133, 54); Chestnut-sided Warbler, 19 (106, 43); Mourning Warbler, 17 (94, 38); House Wren, 3 (17, 7); Com. Flicker, 2; Am. Robin, 2; Hermit Thrush, 2; Chipping Sparrow, 2; Black-backed Three-toed Woodpecker, 1; Least Flycatcher, 1; Blue Jay, 1; Veery, 1; Cedar Waxwing, 1. **Total:** 13 species; 76 territorial males or females ($422/\text{km}^2$, 171/100 acres). **Remarks:** Nests located: Com. Flicker, 1; Black-backed Three-toed Woodpecker, 1; Least Flycatcher, 1; Am. Robin, 1; Mourning Warbler, 1. There is an increase in birds per 100 acres from 144 in 1974 to 171, although there was a decrease in number of species from 18 last year. Shrub counts were ob-

tained by counting the number of shrubs in two 3 72 ft radius circles per every tenth-acre circle. Funding was provided by a cooperative agreement between the University of Minnesota, and the North Central Forest Experiment Station, Project Number 13-420. — GERALD J. NIEMI, *Biol. Dept., Univ. of Minn., Duluth, Minn 55812.*

67. HORSE FARM AND SECOND-GROWTH EDGE. — Location: Vermont; Windsor Co., Woodstock, 0.5 mile E of Route 106 on Town Road 64, $43^\circ 35' \text{N}$, $72^\circ 30' \text{W}$, Woodstock Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 16.2 ha = 40 acres. **Description of Plot:** See AB 27: 1016-17, 1973. **Weather:** Cool and windy through June 19; warm and sunny thereafter. **Coverage:** June 8, 15, 17-26, 29; between 0630 and 1030 hours. Total man-hours: 28. **Census:** Am. Robin 7 (43, 18); White-throated Sparrow, 5 (31, 13); E. Phoebe, 4 (25, 10); Barn Swallow, 4; Red-eyed Vireo, 4; Chipping Sparrow, 4; Wood Thrush, 3 (19, 8); Hermit Thrush, 3; Ovenbird 3; Com. Yellowthroat, 3; Rufous-sided Towhee, 3; Com. Flicker, 2; E. Kingbird, 2; Great Crested Flycatcher, 2; Tree Swallow, 2; Red-breasted Nuthatch, 2; Gray Catbird, 2; Brown Thrasher, 2; Veery, 2; Black-and-white Warbler, 2; Nashville Warbler, 2; Magnolia Warbler, 2; Yellow-rumped Warbler, 2; Chestnut-sided Warbler, 2; Rose-breasted Grosbeak, 2; Field Sparrow, 2; Song Sparrow, 2; Ruffed Grouse, 1; Mourning Dove, 1; Black-billed Cuckoo, 1; Chiff Swallow, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Blackburnian Warbler, 1; Scarlet Tanager, 1; N. Oriole, 1; Indigo Bunting, 1; Dark-eyed Junco, 1. **Total:** 38 species; 86 territorial males, ($531/\text{km}^2$, 215/100 acres). **Remarks:** Red-winged Blackbirds, cowbirds, Starlings, and House Sparrows were present in large flocks (20-30). Starlings effectively prevented the bluebirds from nesting in their usual boxes. Residential development, begun last year on 25 acres of plot, was halted owing to economic recession. — MARTHA L WILLIAMSON, *S. Woodstock, Vt. 05071.*

68. MIXED FOREST, OLD FIELD AND HOME-SITE. — Location: Vermont; Windsor Co., 1.5 miles S of Woodstock on Church Hill; $43^\circ 36' \text{N}$, $72^\circ 31' \text{W}$, Woodstock Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size:** 11 ha = 27 acres (determined from available maps). **Description of Plot:** See AB 27: 982, 1973. **Weather:** Cool and cloudy 42° to 65° , except last three trips in June, when it was humid and 78° . **Coverage:** May 26-27, 29-30; June 1-4, 8-9, 11, 14-15, 19; July 19-21; August 9; between 0515 and 0930 or 1645 and 1900 hours. Total man-hours 23. **Census:** Song Sparrow, 15 (137, 56); Am. Robin, 12 (110, 44); Red-eyed Vireo, 12; Wood Thrush, 10 (92, 37); Veery, 10; Ovenbird, 9 (82, 33); Black-capped Chickadee, 8 (73, 30); Rose-breasted Grosbeak, 8; Com. Yellowthroat, 6 (55, 22); Chestnut-sided Warbler, 5 (46, 19); Chipping Sparrow, 5; Great Crested Flycatcher, 4 (37, 15); Least Flycatcher, 4; Blue Jay, 4; Black-and-white Warbler, 4; Red-winged Blackbird, 4; Com. Grackle, 4; N. Oriole, 4; Am. Goldfinch, 4; Hairy Woodpecker, 3 (27, 11); E. Wood Pewee, 3; Tree Swallow, 3; Cedar Waxwing, 3; Warbling Vireo,

3, Scarlet Tanager, 3, Ruby-throated Hummingbird, 2, Com Flicker, 2; Downy Woodpecker, 2; E. Kingbird, 2, House Wren, 2; Hermit Thrush, 2; Yellow-rumped Warbler, 2; White-throated Sparrow, 2; Ruffed Grouse, 1, E. Phoebe, 1; Barn Swallow, 1; White-breasted Nuthatch, 1; Red-breasted Nuthatch, 1; Gray Catbird, 1, Brown Thrasher, 1; Yellow-throated Vireo, 1; Yellow Warbler, 1; Black-throated Green Warbler, 1; Canada Warbler, 1; Am. Redstart, 1; Indigo Bunting, 1, Pileated Woodpecker, 0.5; Dark-eyed Junco, 0.5; Field Sparrow, 0.5; Black-billed Cuckoo, +; Brown Creeper, +. **Total:** 51 species; 178 territorial males or females ($1629/\text{km}^2$, $659/100 \text{ acres}$). **Remarks:** Very few hawks seen and no owls, hence an explosion of Red Squirrels and Chipmunks. Chipmunks, seen as high as 30 ft examining outer leaves of Quaking Aspen, must have taken a toll of both eggs and newly hatched birds. Rose-breasted Grosbeaks and Veeries increased sharply over last year (grosbeaks from 2 to 8 and Veeries from 5 to 10) and warblers decreased generally. Nests found(20): Am. Robin, 6; Song Sparrow, 3; Tree Swallow, 2; N. Oriole, 2; E. Kingbird, 1; E. Phoebe, 1; House Wren, 1; Veery, 1; Yellow-throated Vireo, 1; Yellowthroat, 1. — JULIA NICHOLSON, *Vermont Institute of Natural Science, Woodstock, Vt. 05091.*

69. ARBORETUM: CONIFEROUS PARKLAND.

— **Location:** Massachusetts; Suffolk Co., at Arnold Arboretum, Jamaica Plain, Boston; areas along Bussey Brook and to the N (E of Walter St.) that are dominated by conifers; $42^\circ 17' 45''\text{N}$, $71^\circ 7' 45''\text{W}$, Newton Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** $9.07 \text{ ha} = 22.4 \text{ acres}$. **Description of Plot:** See AB 26: 961-2, 1972. Changes within the area since 1973 have been insignificant; however, adjacent to the area, a good many deciduous trees were removed in 1974 in the oak woods. Young conifers have been planted in this area; much of the undergrowth was removed, making it more similar to the adjacent parkland habitat. **Coverage 1974:** May 5, 13, 19, 22, 31, June 8, 12, 14, 18, 28; between 0711 and 1222 hours, EDT. Total man-hours: 9.5. **Census 1974:** Chipping Sparrow, 10 (110, 45); Song Sparrow, 3.5 (39, 16); Am. Robin, 2.5; Indigo Bunting, 2; Purple Finch, 1.5; E. Kingbird, 1; Gray Catbird, 1; Starling, 1, Mourning Dove, 0.5; Blue Jay, 0.5; Black-capped Chickadee, 0.5; White-breasted Nuthatch, 0.5; Mockingbird, 0.5; Brown Thrasher, 0.5; Red-winged Blackbird, 0.5; Cardinal, 0.5; Rufous-sided Towhee, 0.5, Orchard Oriole, +. **Total:** 18 species; 27 territorial males or females ($298/\text{km}^2$, $121/100 \text{ acres}$). **Coverage 1975** May 9, 15, 24, 26, 31; June 3, 7, 11, 20, 28; July 2; between 0843 and 1232 hours, EDT. Total man-hours: 9. **Census, 1975:** Chipping Sparrow, 8 (88, 36), Song Sparrow, 3.5 (39, 16); Am. Robin, 2.5; Black-capped Chickadee, 1.5; E. Kingbird, 1; Red-breasted Nuthatch, 1; Gray Catbird, 1; Starling, 1; Cardinal, 1; Purple Finch, 1; Mourning Dove, 0.5; Blue Jay, 0.5; Com. Crow, 0.5; Mockingbird, 0.5; Brown Thrasher, 0.5; Brown-headed Cowbird, 0.5; Indigo Bunting, 0.5; Rufous-sided Towhee, 0.5; Com. Flicker, +, Hairy Woodpecker, +; Downy Woodpecker, +; Great Crested Flycatcher, +; Tufted Titmouse, +. **Total:** 23 species; 25.5 territorial males or females (281/

km^2 , $114/100 \text{ acres}$) — RICHARD W. SIMMERS, JR., 62 Buckingham St., Cambridge, Mass. 02138

70. ARBORETUM: DECIDUOUS PARKLAND.

— **Location:** Massachusetts; Suffolk Co., at Arnold Arboretum, Jamaica Plain, Boston; Bussey Hill and adjacent areas; $42^\circ 18' \text{N}$, $71^\circ 7' 25''\text{W}$, Boston South Quadrangle, USGS. **Continuity:** Established 1972 (1973); 4 consecutive years. **Size:** $20.4 \text{ ha} = 50.5 \text{ acres}$. **Description of Plot:** See AB 27: 983. Changes A few trees have died since 1973 and have been removed. The top of Bussey Hill was planted with shrubs (mostly broad-leaved evergreens) in the spring of 1974. **Coverage 1974:** May 13, 17, 22, 27, 31; June 6, 8, 12, 14, 18, 21, 28, 30; between 0530 and 1255 hours, EDT. Total man-hours: 25.5. **Census 1974:** Gray Catbird, 12 (59, 24); N. Oriole, 7.5 (37, 15); Indigo Bunting, 7 (34, 14); Am. Robin, 6 (29, 12); Brown Thrasher, 5.5 (27, 11); Chipping Sparrow, 3.5 (17, 7), Yellow Warbler, 3 (15, 6); Red-winged Blackbird, 3, Blue Jay, 2; Mockingbird, 2; Starling, 2; Warbling Vireo, 2; Song Sparrow, 2; Mourning Dove, 1; White-breasted Nuthatch, 1; Orchard Oriole, 1; Cardinal, 1, Am. Goldfinch, 1; Mallard, 0.5; Com. Flicker, 0.5, E. Kingbird, 0.5; Brown-headed Cowbird, 0.5; Purple Finch, 0.5; Rufous-sided Towhee, 0.5; Hairy Woodpecker, +; Downy Woodpecker, +; Black-capped Chickadee, +. **Total:** 27 species; 65.5 territorial males or females ($320/\text{km}^2$, $130/100 \text{ acres}$). **Remarks:** Nests or nest-holes found: N. Oriole, 6; Am. Robin, 4, Gray Catbird, 2; E. Kingbird, 1; nuthatch, 1; Starling, 1, Orchard Oriole, 1. The large influx of Indigo Buntings did not last past mid-June, when several males apparently vanished. **Weather 1975:** Relatively warm and dry. **Coverage:** May 9, 18, 22, 24, 26, 31; June 3, 7, 11, 15, 20, 18; July 2; between 0812 and 1233 hours, EDT. Total man-hours: 28. **Census 1975:** Gray Catbird, 12.5 (61, 25); N. Oriole, 10.5 (51, 21), Am. Robin, 6.5 (32, 13); Chipping Sparrow, 4 (20, 8), Red-winged Blackbird, 3.5 (17, 7); Brown Thrasher, 3 (15, 6); Yellow Warbler, 3; Indigo Bunting, 2.5; Mockingbird, 2; Starling, 2; Song Sparrow, 2; Mourning Dove, 1.5; E. Kingbird, 1.5; Blue Jay, 1; White-breasted Nuthatch, 1; Warbling Vireo, 1; Cardinal, 1, House Finch, 1; Am. Goldfinch, 1; Downy Woodpecker, 0.5; Black-capped Chickadee, 0.5; Orchard Oriole, 0.5; Rufous-sided Towhee, +; Great Crested Flycatcher, +; Tufted Titmouse, +; Com. Grackle, +, Brown-headed Cowbird, +; Purple Finch, +. **Total:** 28 species; 62.5 territorial males or females ($306/\text{km}^2$, $124/100 \text{ acres}$). **Remarks:** Nests or nest-holes located include: N. Oriole, 9; Red-winged Blackbird, 3, E. Kingbird, 1; Am. Robin, 1; Starling, 1; Yellow Warbler, 1; Orchard Oriole, 1; Indigo Bunting, 1. The season appeared to be successful for most species, however, the Indigo Bunting nest contained a young cowbird. Damage from cankerworms was much less than in 1973. — RICHARD W. SIMMERS, JR., 62 Buckingham St., Cambridge, Mass. 02138.

71. 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, 8 consecutive years. **Size:** 14.17 ha = 35 acres (irregular, greatest dimensions 653 x 364 yards, surveyed). **Description of Plot:** See *AFN* 22: 714-715, 1968. **Coverage:** May 17-20, 23-29; June 2, 4, 7-8, 11, 15, 18-19, 22, 28-19; between 0440 and 1215 or 1415 and 1820 hours, EDT. Total man-hours: 40 **Census:** Wood Thrush, 14 (99, 40); Ovenbird, 14; Red-eyed Vireo, 10 (71, 29); Rufous-sided Towhee, 10; Veery, 9 (64, 26); Am. Robin, 6 (42, 17); Scarlet Tanager, 5 (35, 14); Rose-breasted Grosbeak, 5; Com. Flicker, 4 (28, 11); Blue Jay, 4; Cardinal, 4; E. Wood Pewee, 3.5 (25, 10); White-breasted Nuthatch, 3 (21, 9); House Wren, 3; Gray Catbird, 3; Black-and-white Warbler, 3; N. Oriole, 3; E. Phoebe, 2; Chestnut-sided Warbler, 2; Com. Yellowthroat, 2; Great Crested Flycatcher, 1.5; Brown Thrasher, 1.5; Mourning Dove, 1; Hairy Woodpecker, 1; Black-capped Chickadee, 1; Tufted Titmouse, 1; Starling, 1; Blue-winged Warbler, 1; Am. Redstart, 1; Song Sparrow, 1. **Total:** 30 species; 120.5 territorial males (851/km², 344/100 acres). **Remarks:** Nests found: Com. Flicker, 1; E. Phoebe, 4; House Wren, 2; Am. Robin, 1. Compared with 1974, Brown-headed Cowbird fell from 4 to 0, Rufous-sided Towhee from 14 to 10. In the span 1973-75, Wood Thrush numbered 13, 8, 14. — LAURA H. MOSELEY, 1083 Hillsboro Beach, Pompano Beach, Fla 33062.

72. UPLAND BRUSHY PASTURE. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°42'50"N, 73°13'28"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 9 intermittent years. **Size:** 8.5 ha = 21 acres (parallelogram) **Description of Plot:** See *AFN* 19: 609-610, 1965. **Coverage:** April 28-29; May 14-15; June 4, 8, 13, 16-17, 20-21. Hours varied from 0500 to 2230 and totaled 22. **Census:** Gray Catbird, 11 (129, 52); Rufous-sided Towhee, 7 (82, 33); Com. Yellowthroat, 6 (71, 29); Field Sparrow, 6; Blue-winged Warbler, 5 (59, 24); Song Sparrow, 5; Cedar Waxwing, 3 (35, 14); Prairie Warbler, 3; Am. Goldfinch, 3; Am. Woodcock, 2; Red-eyed Vireo, 2; Brown-headed Cowbird, 2; Black-capped Chickadee, 1.5; Am. Robin, 1.5; Com. Flicker, 1; Downy Woodpecker, 1; Brown Thrasher, 1; Wood Thrush, 1; Veery, 1; Brewster's Warbler x Blue-winged Warbler, 1; Am. Redstart, 1; E. Kingbird, 0.5; House Wren, 0.5; Black-and-white Warbler, 0.5; Yellow Warbler, 0.5; N. Oriole, 0.5; Am. Kestrel, +; E. Phoebe, +; Least Flycatcher, +; Blue Jay, +; Yellow-rumped Warbler, +; Chestnut-sided Warbler, +; Cardinal, +; Rose-breasted Grosbeak, +; Indigo Bunting, +. **Total:** 35 species; 67.5 territorial males (794/km², 321/100 acres). **Remarks:** Habitat continues to undergo rapid change from open, grazed pasture to hardwood forest. A slight drop in the overall density may reflect a peculiar stage in this development. The wetter, more fertile areas of sapling and alder growth have grown to dense canopy levels of 20 and 30 ft high, producing shade areas devoid of growth below, at the same time that many areas are not yet grown to the dense low thicket growth that provides food and cover for many species. — ANDREW MAGEE, Woollybear Company, Troy, N. H. 03465.

73. ABANDONED HAYFIELDS WITH FEW TREES. — **Location:** Ontario; Halton Co., City of Oakville; Bronte Creek Provincial Park; Concession II SDS, parts of lots 34 and 35; 43°24'00"N, 79°45'30"W. **Continuity:** New. **Size:** 25.3 ha = 62.5 acres, (square, determined from 1 in = 200 ft maps, derived from aerial photography). **Description of Plot** Composed of open fields, in long grass, with one poorly developed hedgerow containing just a few trees. In order to quantitatively estimate the vegetation, nine tenth-acre circles were picked at random and the plant dominance was ascertained by sight in each circle. Dominance was given according to the relative per cent of the ground that was covered by the aerial parts of each species of plant. The following list gives the relative dominance averaged over the plot, with the most common plant listed first and relative dominance decreasing from there. The twelve most common plants are given. Timothy (*Phleum pratense*), a grass (*Agrostis stolonifera*), Wild Carrot (*Daucus carota*), Twitch Grass (*Agropyron repens*), Red Fescue (*Festuca rubra*), Reed Canary Grass (*Phalaris arundinacea*), Alfalfa (*Medicago sativa*), Curled Dock (*Rumex crispus*), Dandelion (*Taraxacum officinale*), Canada Blue Grass (*Poa compressa*), Rough-fruited Cinquefoil (*Potentilla recta*), Chicory (*Cichorium intybus*). **Edge:** Similar abandoned fields continue to the E and S. A gravel road (Burloak Drive) borders the W edge. A farm house, barn and outbuildings are found 100 ft off the N edge. **Topography:** Relatively flat, but two intermittent watercourses run in depressions through the plot. **Elevation:** From 405 to 421 ft with a gentle slope downwards toward Lake Ontario, 2.5 miles to the SE. **Weather:** See Census 77. **Coverage 1974:** June 4, 13, 17, 19-20, 25; July 5, 6, 13; usually between 0530 and 0820. Total: 17.5 hours. **Census 1974:** Savannah Sparrow, 25 (99, 40); Red-winged Blackbird, 19.5 (77, 31), Bobolink, 7.5 (30, 12); Song Sparrow, 4 (16, 6); Barn Swallow, 2+; Am. Robin, 1.5; E. Meadowlark, 1.5, Rock Dove, 1+; Starling, 1+; Am. Goldfinch, 1+; Killdeer, 1; Spotted Sandpiper, 1; Horned Lark, 1, Com. Grackle, 1; Brown-headed Cowbird, 1. **Total:** 15 breeding species; 69 territorial males or females (273/km², 110/100 acres). **Remarks:** This plot was located in an area of intensive future development as Bronte Creek Provincial Park changes in the years to come. In 1974 a two-lane road was being built through the west side of this plot. During the census period the area between this new road and Burloak Drive, on the west side, was devoid of topsoil as construction of sound-buffering hills was started. Altogether the construction activities occupied 26.4% of the area, or 6.7 ha. This land was essentially non-productive with little or no vegetative cover. **Coverage 1975:** May 25, 31; June 11, 21, 28, 30; July 5, 12; mostly between 0600 and 0800. Total man-hours: 15.5. **Census 1975:** Savannah Sparrow, 19 (75, 30); Red-winged Blackbird, 14.5 (57, 23), Bobolink, 6 (24, 10); Song Sparrow, 5.5 (22, 9), Am. Goldfinch, 1+; Killdeer, 1; Spotted Sandpiper, 1, Horned Lark, 1; Starling, 1; E. Meadowlark, 1; Rock Dove, 0.5; Mourning Dove, 0.5; Willow Flycatcher, 0.5; Barn Swallow, 0.5; Com. Crow, 0.5. **Total:** 15 breeding species; 53.5 breeding males or females (212/km², 86/100 acres). **Remarks:** In 1974 a two-lane road was built through this plot. In 1975 the area

around the road was still actively disturbed as top-soil was placed back into the ditches and the medians were cultivated and seeded. During the previous winter months, two sewer and water lines were laid, but by breeding season this construction was finished. This disturbed area grew a sparse crop of annual weeds. Throughout the period, construction proceeded noisily on a transit road through the plot. Totally, the three construction projects, heavily disturbed 8.5 ha, or 33.8%. This was an increase of 2 ha over 1974. The territorial male density dropped from 266/km² in 1974 to 212 males in 1975. Both years showed the same number of species (*i.e.* 15) but in 1975 the numbers of several species were down, including: Savannah Sparrow, Red-winged Blackbird and Bobolink. Three species moved from breeder status to visitor status: Am Robin, Com. Grackle and Brown-headed Cowbird. Two species moved from visitor status to breeding status: Mourning Dove and Com. Crow. The Willow Flycatcher was new. Thanks to the Ontario Ministry of Natural Resources for permission to do the study and to A. L. A. Middleton for assistance. — PAUL F. J. EAGLES, *Center for Resources Development, Univ. of Guelph, Guelph, Ontario, Canada.*

74. ABANDONED HAYFIELDS WITH SCATTERED HEDGEROWS. — **Location:** Ontario; Halton Co., City of Oakville; Bronte Creek Provincial Park; Concession I SDS, part of lots 34 and 35; 42°24'15"N, 79°47'W. **Continuity:** New. **Size:** 25.3 ha = 62.5 acres (square, measured from 1 in = 200 ft maps, derived from aerial photographs). **Description of Plot:** Old fields, in long grass. A few scattered hedgerows are well developed with a mixture of hawthorn (*Crataegus* sp.), Red Maple (*Acer rubrum*), Choke Cherry (*Prunus virginiana*), Gray Dogwood (*Cornus racemosa*), plus various wild Pears (*Pyrus communis*). The hedgerow trees varied from 8 to 27 ft in height. In order to quantitatively estimate the herbaceous vegetation, four tenth-acre circles were picked and the plant dominance was ascertained, by sight in each circle. The dominance related to the relative percentage of the ground that was covered by the aerial parts of each plant species in each circle. The number of circles investigated was low and chosen non-randomly. The following list gives the relative herbaceous plant dominance averaged over the plot with the most common plant listed first and relative dominance decreasing from there: Timothy (*Phleum pratense*), Bromegrass (*Bromis inermis*), goldenrod (*Solidago* sp.), Canada Thistle (*Cirsium arvense*), Canada Blue Grass (*Poa compressa*), grass (*Agrostis stolonifera*), Red Clover (*Trifolium pratense*), Alsike Clover (*Trifolium hybridum*), Wild Carrot (*Daucus carota*), Cow Vetch (*Vicia cracca*), St. John's Wort (*Hypericum perforatum*), Great Burdock (*Arctium lappa*). **Edge:** Similar grass-land habitat extends from all four sides. An upland, deciduous forest is located 100 yards SE, highway No. 5 is located 266 yards NW and a farm house, barn and outbuildings are located 100 yards NE. **Topography:** Relatively flat with a higher center dome sloping downwards towards the N and S. The elevation varies from 487.5 to 507 ft. One intermittent watercourse, that flows in the spring and after

heavy rains, goes through the plot. **Weather.** See Census 77. **Coverage 1974:** June 6, 14, 18, 22, 24; July 4, 6, 12; most censuses from 0550 to 0830. Total 16 man-hours. **Census 1974:** Savannah Sparrow, 17.5 (69, 28); Red-winged Blackbird, 11 (43, 18); Song Sparrow, 9.5 (38, 15); Bobolink, 5.5 (22, 9); Grasshopper Sparrow, 3.5 (14, 6); Starling, 3 (12, 5); Am. Goldfinch, 2, E. Meadowlark, 1.5; E. Kingbird, 1; Brown Thrasher, 1; Yellow Warbler, 1; N. Oriole, 1; Com. Grackle, 1; Vesper Sparrow, 1; Red-tailed Hawk, 0.5; Am Kestrel, 0.5; Upland Sandpiper, 0.5; Mourning Dove, 0.5. **Total:** 18 breeding species; 62 territorial males or females (245/km², 99/100 acres). **Description of Plot 1975:** This plot changed dramatically between 1974 and 1975. In the fall of 1974 all the open fields were plowed and planted to fall wheat. Approximately 22.1 ha (87.3%) is now in wheat, that had been in timothy and brome grasses. **Edge:** Similar wheat fields extend outwards on the E, N and W sides. Half of the S edge is wheat and half is a brome grass field. **Weather** See Census 77. **Coverage 1975:** May 24; June 7, 11, 20, 22; July 1, 6, 13; between 0600 and 1000. Total man-hours: 12.5. **Census 1975:** Savannah Sparrow, 17.5 (69, 28); Song Sparrow, 7 (28, 11); Red-winged Blackbird, 4.5 (18, 7); Bobolink, 3.5 (14, 6); Starling, 3 (12, 5); Willow Flycatcher, 2; Vesper Sparrow, 2; Mourning Dove, 1; E. Kingbird, 1; Am. Robin, 1; Yellow Warbler, 1; Am. Goldfinch, 1. **Total:** 12 breeding species; 44 territorial males or females (174/km², 70/100 acres). **Remarks:** The wheat was almost sterile of bird life. A few birds such as Savannah Sparrows, Vesper Sparrows, Song Sparrows and E. Kingbirds land in the grain but usually stay near the hedgerows. Most birds only fly over as they travel from hedgerow to hedgerow or to some piece of grass that was left. The following species went from breeding status in 1974 to visitor status in 1975: Grasshopper Sparrow, Am Kestrel, Com. Grackle, E. Meadowlark, Brown Thrasher and Upland Sandpiper. Red-winged Blackbirds, Song Sparrows and Bobolinks all dropped in numbers. Willow Flycatcher was new. Overall, the number of breeding species dropped from 18 to 12 and the overall density dropped from 245 males/100 ha to 174. Nest found: Vesper Sparrow, 1. This census shows the importance that hedgerows have for maintaining populations of some species of birds, even when the area around them is "sterilized". Thanks to the Ontario Ministry of Natural Resources for permission to do the study and to A. L. A. Middleton for assistance — PAUL F. J. EAGLES, *Center for Resources Development, Univ. of Guelph, Guelph, Ontario, Canada*

75. APPLE ORCHARD, CULTIVATED FIELDS, AND CATTAI MARSH — **Location:** Ontario, Huron Co., West Wawanosh Township, 3 miles E of Lucknow, 1.5 miles S of Highway No. 86 on Sideroad 21-22; 43°54'N, 81°28'W, Dept. of National Defence Army Survey Establishment, Canada sheet 40 P/14 West half, Wingham. **Continuity:** New. **Size:** 19.5 ha = 48.2 acres (determined by planimeter from airphoto). **Description of Plot:** Made up of several distinct habitats: the orchard, fields and field margins, and several cattail marshes. The orchard lies on a W slope,

beginning at the road, about $\frac{1}{3}$ of the way up the valley side, ending at the crest of the hill (1050 ft). It consists of about 450 apple trees (*Pyrus malus*) of several varieties, 150 are standard trees, about 80 years old, averaging 25 ft tall; 250 are dwarf trees, about 12 years old, averaging 20 ft tall. The orchard had been poorly maintained over the last decade resulting in many trees being overgrown with suckers, deadwood, and climbing vines (wild grape). In the last year efforts have been made to rejuvenate the orchard. The fields lie adjacent to the orchard to the E and S. The fields to the E slope down from the crest of the hill to about 1000 ft. Two fields are included in the plot. The first, approximately 6.2 acres, is planted to Winter Rye; the second, about 5.3 acres, is planted to mixed grain (oats and barley). Between them is a cattail marsh and field margin of willow (*Salix*), goldenrod (*Solidago*), and other weeds. The fields to the S also slope away from the orchard, but to the S. Both are planted to mixed grain (10.7 and 3.2 respectively), and are separated by a small cattail marsh and a field margin of willow, goldenrod, grasses and other weeds. There is a pond-marsh area in the SE corner that drains into an open drainage ditch that runs E to W along the edge of the second field to the S of the orchard. The pond-marsh area is composed of willow, ash (*Fraxinus*), poplar (*Populus*), and hawthorn (*Crataegus*). The breakdown of the major habitat areas is orchard 9.5 acres, 19.7% of the total study area: fields, 27.8 acres, 57.5%; field margins, 4.4 acres, 9.3%; cattail marshes, 1.1 acres, 2.3%; perimeter, 5.4 acres, 11.2%. **Edge:** The N edge is open pasture. The W boundary is a well maintained gravel road, frequently used by local traffic. On the other side of this road is a hay field and scrub pasture, containing a small pond, an open drainage ditch and scattered clumps of hawthorn and willow. The S boundary consists partly of a meadow that lies between the pond-marsh area and a maple-beech woodlot. The rest of the S boundary consists of the drainage ditch and another field of mixed grain. The E boundary is a large field (15 acres), planted to buckwheat. **Topography:** Rolling hills ranging from about 975 to about 1050 ft. **Coverage:** May 20, 26; June 1, 7, 15; 8 trips between 0600 and 0900; between 1830 and 2130. Total man-hours: 30. **Census:** Red-winged Blackbird, 18 (92, 37); E. Kingbird, 5 (26, 10); Am. Robin, 5; Song Sparrow, 5; N. Oriole, 4 (21, 8); Am. Goldfinch, 3 (15, 6); Mourning Dove, 2 (4, 10); House Wren, 2; Cedar Waxwing 2; House Sparrow, 2; Savannah Sparrow 2; Bobolink, 1.5; Killdeer 1; Spotted Sandpiper, 1; Com. Snipe, 1; Barn Swallow, 1; Starling, 1; Brown-headed Cowbird 1; Chipping Sparrow, 1. **Total:** 18 species; 57.5 territorial males ($295/\text{km}^2$, 119/100 acres). **Remarks:** The orchard, 19.7% of the plot, contained 14 of the 18 nesting species and 28 of the 57.5 territorial males (49%). The marsh areas (2.3%) contained 4 species, and 20 territorial males (35%). The fields (57.5%) contained 3 species and 3.5 males (6%). This study was done in cooperation with Paul Eagles and the Department of Man-Environment Studies, Faculty of Environmental Studies, Univ. of Waterloo, Waterloo, Ontario. — DAVE LEVIN, R.R. 1, Lucknow, Ontario, Canada.

76. UPLAND DECIDUOUS FOREST AND ABANDONED FIELDS. — **Location:** Ontario; Halton Co.; City of Oakville; Bronte Creek Provincial Park, Wildlife Management Area; Concession I SDS, parts of lots 34 and 35; $43^{\circ}24'50''\text{N}$, $79^{\circ}46'30''\text{W}$. **Continuity** New. **Size:** 25.3 ha = 62.5 acres (square, determined from 1 in. = 200 ft maps derived from aerial photography). **Description of Plot:** A mixture of forest, old fields and well-developed hedgerows. The center is old fields that have not been plowed or pastured for several years. Three sides have portions of adjacent woodlots and the fourth side is open to the N with a continuation of fields. Two intermittent watercourses, that run in the spring and after heavy rains, pass from W to E through the plot. There are a wide variety of successional stages that range from old field through shrub-field to mature deciduous forest. Certain low spots stay moist through most of the summer and this allows small cat-tail and sedge areas to exist. In order to quantitatively estimate the vegetation, ten tenth-acre circles were chosen at random. One circle fell in a woodlot and this circle was treated in the method given by James and Shugart Analysis of this circle gave the following results: Trees, 3-inches diameter and over based on one 0.1-acre circular sample, 310/acre; total basal area $98 \text{ ft}^2/\text{acre}$ Species comprising 100% of the total number of trees found in the circle (figures after each species name give number of trees per acre, relative density in per cent, and relative dominance in that order): Sugar Maple (*Acer saccharum*), 140, 45, 54; Shagbark Hickory (*Carya ovata*), 70, 22.5, 22.4; Beech (*Fagus grandifolia*), 20, 6.4, 4.1; Red Maple (*A. rubrum*), 20, 6.4, 6.1; hawthorn (*Crataegus* sp.), 20, 6.4, 2.2; dead 20, 6.4, 2.2; Ironwood (*Ostrya virginiana*), 10, 3.1, 1.1, Red Ash (*Fraxinus pennsylvanica*), 10, 3.1, 1.1. Trees by diameter size class (figures after each class give number of trees per acre, relative density in per cent, basal area in ft^2/acre and relative dominance); A (3-6 in. dbh), 150, 48.5, 15, 15.3; B (6-9 in.), 90, 29, 27, 27.6; C (9-15 in.), 70, 22.6, 56, 57.3. Shrub stems/acre: 14,000. Ground cover is 55% and canopy cover is 95%. The canopy height average 42 ft with a range of 25 to 59 ft. The tree height in the hedgerows varied from 18 to 63.5 ft. The other nine circles fell in the old field habitats. In order to quantitatively estimate the vegetation in these samples plant dominance of each species was ascertained by sight in circle. The relative dominance was then averaged over all the nine samples to give the total relative dominance. The following gives the relative dominance for the most common plants: Timothy (*Phleum pratense*), goldenrod (*Solidago* sp.), Cow Vetch (*Vicia cracca*), grass (*Agrostis stolonifera*), Wild Carrot (*Daucus carota*), Brome Grass (*Bromis inermis*), Ox-eyed Daisy (*Chrysanthemum leucanthemum*), St. John's Wort (*Hypericum perforatum*), Canada Thistle (*Cirsium arvense*), rush (*Scirpus* sp.), Red Clover (*Trifolium pratense*), Gray Dogwood (*Cornus racemosa*). **Edge:** The E and part of the S edge is deciduous forest. The W edge is deciduous forest that continues down into the deep Bronte Creek ravine. The N and of the S edges are old fields **Topography:** Relatively flat. The land varies in height from 475 to 490 ft with an overall gentle downward slope to the SE. **Weather:** See Census 77. **Coverage** 1974: June 7, 9, 16, 22-23, 26; July 4, 12. Man-hours

26, between 0600 and 1100 and 1810 and 2110. **Census 1974** Song Sparrow, 23.5 (93, 38); Red-winged Blackbird, 14 (55, 22); Starling, 7.5 (30, 12); Gray Catbird, 3.5 (14, 6); N. Oriole, 3.5; E. Kingbird, 3 (12, 5); House Wren, 3; Field Sparrow, 3; Savannah Sparrow, 2.5; Com. Grackle, 2; Blue Jay, 1.5; Black-capped Chickadee, 1.5; Wood Thrush, 1.5; Am. Goldfinch, 1+; Am. Kestrel, 1; Mourning Dove, 1; Com Flicker, 1; E. Wood Pewee, 1; Brown Thrasher, 1; Am. Robin, 1; Bobolink, 1; E. Meadowlark, 1; Brown-headed Cowbird, 1; Rose-breasted Grosbeak, 1; Vesper Sparrow, 1; Red-tailed Hawk, 0.5; Red-headed Woodpecker, Great Crested Flycatcher, 0.5; Barn Swallow, 0.5; Rufous-sided Towhee, 0.5. **Total:** 30 species; 85 territorial males or females ($336/\text{km}^2$, 136/100 acres). **Remarks:** This plot comprises part of the Wildlife Management Area of Bronte Creek Provincial Park Red-headed Woodpeckers have been moving northward, through southern Ontario, in recent years and bred successfully here this year. **Coverage 1975:** May 24; June 1, 14, 20, 22; July 1, 6, 13; most trips between 0550 and 1145. Total man-hours: 22. **Census 1975** Song Sparrow, 22.5 (89, 36); Red-winged Blackbird, 21 (83, 34); Starling, 8 (32, 13); House Wren, 5.5 (22, 9); Am. Robin, 4 (16, 6); Field Sparrow, 4; N. Oriole, 3.5 (14, 6); Rufous-sided Towhee, 3 (12, 5); Am. Goldfinch, 3; Bobolink, 2.5; E. Kingbird, 2; Com. Grackle, 2; Savannah Sparrow, 2; Mourning Dove, 1.5; Gray Catbird, 1.5; Brown Thrasher, 1.5; Wood Thrush, 1.5; Am. Woodcock, 1; Com. Flicker, 1; Blue Jay, 1; Black-capped Chickadee, 1; Veery, 1; Com Yellowthroat, 1; E. Meadowlark, 1; Brown-headed Cowbird, 1; Red-tailed Hawk, 0.5; Am. Kestrel, 0.5; Pileated Woodpecker, 0.5; Red-headed Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Red-eyed Vireo, +. **Total:** 31 breeding species; 99.5 territorial males or females ($393/100\text{km}^2$, 159/100 acres). **Remarks:** There was only one noticeable change since 1974. Part of a field (.83 hectares or 3.3%) in the N end was planted to fall wheat in the fall of '74. A shrub and tree planting has been undertaken but the plants are still small. The human visitor usage is still low with only a few horses and riders. The number of species increased in 1975, by one, to 31. The overall density increased from $336/\text{km}^2$ to 393, a 17% increase. This change was spread over several species. Six species had significantly increased breeding densities: Red-winged Blackbird, House Wren, Am. Robin, Rufous-sided Towhee, Am. Goldfinch and Bobolink. Gray Catbird had a large drop in numbers. Four species became breeders this year that had not been recorded in '74: Am. Woodcock, Veery, Com. Yellowthroat and Pileated Woodpecker. Two species were reduced to visitor status from former breeding status: E. Wood Pewee and Rose-breasted Grosbeak. One former breeder, Vesper Sparrow, disappeared. Thanks to the Ontario Ministry of Natural Resources for permission to do the study and to A. L. A. Middleton for assistance.

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77. WOODED RAVINE, FLOODPLAIN AND RIVER. — Location: Ontario; Halton Co.; City of

Oakville, Bronte Creek Provincial Park, Half-Moon Valley; Concession II SDS, part of lots 31 and 32, $43^\circ24'40''\text{N}$, $79^\circ44'50''\text{W}$. **Continuity:** New. **Size** 10.3 ha = 25.3 acres (square, determined from 1 in = 200 ft maps, derived from air photos). **Description of Plot:** Bronte Creek running diagonally through the park has cut a ravine, averaging 110 ft in depth, that is heavily forested. The more distinct communities found are: 1) upland maple-beech forest, 2) upland conifer forest, 3) sphagnum-white cedar swamp (an old oxbow), 4) floodplain sycamore forest, 5) floodplain willow-dogwood edges, 6) floodplain brome grass field, 7) river. In order to quantitatively describe the "average" habitat the method as described by *James and Shugart* was used. Six tenth-acre circles were chosen at random. The results are given below. Trees, 3 inches (dbh) based on 6, 0.1-acre circular samples, 137/acre; total basal area $73.7 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees (figures shown after each species name give number of trees per acre, relative density in per cent, relative dominance and frequency, in that sequence): Sugar Maple (*Acer saccharum*), 58, 25.6, 13.2, 50; dead trees, 43, 19, 20 6, 66; White Pine (*Pinus strobus*), 23, 10.2, 16.6, 50; Red Ash (*Fraxinus pennsylvanica*), 22, 9.5, 3.0, 66; White Birch (*Betula papyrifera*), 15, 6.5, 6.9, 50; Black Willow (*Salix nigra*), 12, 5.1, 12.1, 16; hawthorn (*Crataegus* sp.), 10, 4.4, 0.82, 16; Balsam Poplar (*Populus balsamifera*), 8, 3.7, 2.8, 16; Butternut (*Juglans cinerea*), 7, 2.9, 1.8, 33; Yellow Birch (*B. lutea*), 5, 2.2, 1.5, 16; Hop-hornbeam (*Ostrya virginiana*), 5, 2.2, 0.6, 16; Red Oak (*Quercus rubra*), 5, 2.2, 14 8, 16. Trees by diameter size class (the figures after each class give numbers of trees per acre, relative density in per cent, basal area in ft^2/acre and relative dominance) A (3 to 6 in. dbh), 108, 47.5, 10.8, 8.8; B (6 to 9 in.), 46.5, 20.5, 14, 11.2; C (9 to 15 in.), 51, 22 6, 41, 33.5; D (15 to 21 in.), 15, 6.5, 27, 22; E (21 to 27 in.), 1.7, 1.4, 5.1, 4.2; F (27 to 33 in.), 5, 2.2, 24 5, 20. There are 32,800 shrub stems/acre. The ground cover is 65.8% and the canopy cover is 57.5%. The canopy varied from 41 to 84.5 ft in height with an average of 60.5 ft. The average understory height was 16.5 ft. The ground cover has a high diversity of species. The above data are slightly misleading; part of one circle included Bronte Creek and part of another included the brome grass field. All circles are averaged together. This plot includes part of a nature trail that received light usage. **Edge:** Ravine and floodplain forests extend in three directions. The W edge is half upland, deciduous forest and half wheat field. **Topography:** From flat uplands on the W edge, down very steep ravine walls, across the floodplains and river to the E side of Bronte Creek. The height varies from 300 to 415 ft. **Weather 1974** May with below-normal temperature (mean 51°F), above-normal rainfall (monthly total of 4.33 in.). From June 10 to 21 there was some rain every day. July with average temperature (69.1°F) and below-average rainfall (2.05 in.). **Coverage:** June 8-9, 15-16, 22-23, July 5, 13; between 0610 and 1100. Total man-hours 24. **Census 1974:** Song Sparrow, 6 (59, 24); House Wren, 5 (49, 20); N. Oriole, 4 (39, 16); Cardinal, 4; Indigo Bunting, 3.5 (34, 14); Gray Catbird, 3 (29, 12), Black-capped Chickadee, 2+; Great Crested Flycatcher, 2; Blue Jay, 2; Starling, 2; Red-eyed Vireo,

2, Am. Goldfinch, 2; Com. Flicker, 1.5; Wood Thrush, 1.5, Mourning Warbler, 1.5; Rose-breasted Grosbeak, 1.5, E. Wood Pewee, 1+; Ruffed Grouse, 1; Spotted Sandpiper, 1; Mourning Dove, 1; Belted Kingfisher, 1; Downy Woodpecker, 1; Am. Robin, 1; Pine Warbler, 1, Com. Grackle, 1; Brown-headed Cowbird, 1; Field Sparrow, 1; Red-tailed Hawk, 0.5; Veery, +. **Total:** 29 species; 55 territorial males or females ($537/\text{km}^2$, 217/100 acres). **Weather 1975:** May, unusually mild (monthly mean temperature 61°F), rainfall spotty (monthly total 2.16 in.). June higher than normal mean temperature (66.1°F) with frequent showers from 1 to 20 (monthly total 2.95 in.). July slightly above normal mean temperature (70°F) and rainfall (3.43 in.). **Coverage:** May 25, 31; June 7, 14, 21, 28; July 5, 12. Total man-hours: 18.5 hours. **Census 1975:** Gray Catbird, 6 (59, 24); House Wren, 4 (39, 16); Wood Thrush, 3.5 (34, 14); Cardinal, 3.5; Song Sparrow, 3.5; Black-capped Chickadee, 3 (29, 12); Am. Robin 2.5; Starling, 2.5; Blue Jay, 2; Red-eyed Vireo, 2; N. Oriole, 2; Indigo Bunting, 2; Mourning Dove, 1.5; Com Flicker, 1.5; Am. Redstart, 1.5; Rose-breasted Grosbeak, 1.5; Ruffed Grouse, 1; Spotted Sandpiper, 1; Belted Kingfisher, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Winter Wren, 1; Pine Warbler, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Am. Goldfinch, 1. **Total:** 28 species; 54.5 territorial males or females ($532/\text{km}^2$, 215/100 acres). **Remarks:** The nature trail was completed with the addition of a boardwalk through the sphagnum-white cedar swamp. This was the only physical change in the plot since 1974. There was slightly increased visitor usage on the nature trail and by fishermen along the river. Altogether there was little change in the bird life. There was a drop of one breeding species and a drop from 537 to 532 males/ km^2 . Three species became only visitors: Mourning Warbler, Field Sparrow, and Red-tailed Hawk. The Veery disappeared altogether. Two species changed from visitor to breeder status: Am. Redstart and Scarlet Tanager. The Winter Wren was new. Two species dropped in number: Song Sparrow from 6 to 3.5 and N. Oriole from 4 to 2; two species raised their numbers, Gray Catbird from 3 to 6 and Am. Robin from 1 to 2.5. The bird species' diversity and density were quite similar between 1974 and 1975. Thanks to the Ontario Ministry of Natural Resources for permission to do the study and to A. L. A. Middleton for assistance. — PAUL F. J. EAGLES, Center for Resources Development, Univ. of Guelph, Guelph, Ontario, Canada.

78. SHRUB COMMUNITY I. — **Location:** New York, Chautauqua Co., Erie Lake Plain, along Van Buren Road 1/5 mile E of Route 5; $42^\circ26'41''\text{N}$, $79^\circ24'47''\text{W}$, Brocton Quadrangle, USGS. **Continuity:** New. **Size:** 9.3 ha = 23 acres (L-shaped, planimetered). **Description of Plot:** The shrub community for the most part is an extremely dense, homogeneous plot of S Arrowwood (*Viburnum dentatum*) and Silky Dogwood (*Cornus amomum*). Parts of the community are more open, with shrubs and grasses each covering about 50% of the area. Green Ash (*Fraxinus pennsylvanica*) and Red Maple (*Acer rubrum*) are invading in

the open areas and reach a height of about 30 ft. The shrubs attain a height of 7 to 8 ft. A quantitative survey of the vegetation gave the following results: Shrubs (35 cm tall and 2.5 cm. dbh), based on three 6.6 x 33 ft transects, 50,000/acre. Species comprising 90% of the total number of shrubs where dominance is based on cover (line-intercept method): S. Arrowwood 36,200, 72, 54, 39; Silky Dogwood 12,000, 24, 34, 32. **Edge Topography:** Flat. **Elevation:** 620 ft. **Coverage:** May 16-17, 20; June 3, 8, 11, 19, 21; starting at about 0545 and 2015 to 2130. Total man-hours 15. **Census:** Yellow Warbler, 13 (140, 57); Willow Flycatcher, 7 (75, 30), Gray Catbird, 7; Com. Yellowthroat, 5.5 (59, 24), Song Sparrow, 5.5; Red-winged Blackbird, 5 (54, 22), Wood Thrush, 3 (32, 13); Rufous-sided Towhee, 2.5, Am. Robin, 1.5; Mourning Dove, 1; Brown-headed Cowbird, 1; Cardinal, 1; Field Sparrow, 1. **Total:** 13 species; 54 territorial males ($580/\text{km}^2$, 235/100 acres) **Remarks:** This census was funded by Niagara-Mohawk Power Corporation as part of a larger study — CATHIE A. BAUMGARTNER, JOE McMULLEN, and VINCENT J. LUCID, ROY S. SLACK (compiler), Environmental Analysts, Inc., 333 Crossways Park Drive, Woodbury, N. Y. 11797.

79. SHRUB COMMUNITY II. — **Location:** New York; Erie Lake Plain, Chautauqua Co., $\frac{1}{2}$ mile N of the East Middle Rd RR trestle. $42^\circ32'33''\text{N}$, $79^\circ12'30''\text{W}$, Silver Creek Quadrangle, USGS. **Continuity:** New. **Size:** 8.9 ha = 22 acres (rectangle, planimetered). **Description of Plot:** The shrub community is dominated by hawthorn (*Crataegus spp.*) in the understory (trees > 2.5 cm but < 10 cm dbh) and the shrub layer (plants > 35 cm tall and < 2.5 cm dbh). The hawthorns, which attain a height of 15 to 20 ft and usually grow in clusters, are interspersed with shrubs and grassy open areas. Large clones of Panicle Dogwood (*Cornus racemosa*) are common. A few individuals of White Ash (*Fraxinus americana*), Red Maple (*Acer rubrum*), and Red Oak (*Quercus rubra*) have invaded the community. These trees are widely scattered and are about 30 to 40 ft tall. Quantitative analysis: On the basis of four 6.6 x 33 ft transects there are 14,000 shrubs/acre. Species comprising 90% of the total number of shrubs where dominance is based upon cover (line-intercept method): hawthorn, 5200, 38, 93, 47; Silky Dogwood (*C. amomum*), 5400, 39, 6, 11, S Arrowwood (*Viburnum dentatum*), 2000, 24, 0, 16 Hawthorn alone reached understory size with a density of 800/acre and a total basal area of $31.5 \text{ ft}^2/\text{acre}$ **Edge:** Three sides by northern hardwoods and the remaining side by corn field. **Topography:** Flat. **Elevation:** 670 ft. **Weather:** Moderate, no rain on census mornings. **Coverage:** May 15, 20, 22; June 7, 24, 17-18, 22, 25. Eight trips between 0545 and 0800, 1 trip 2025 to 2127. Total man-hours: 11.1. **Census:** Yellow Warbler, 7.5 (84, 34); Gray Catbird, 5 (56, 23), Blue-winged Warbler, 3 (34, 14); Rufous-sided Towhee, 3; Song Sparrow, 3; Com. Yellowthroat, 2, Field Sparrow, 2; Willow Flycatcher, 1; Alder Flycatcher, 1; Brown Thrasher, 1; Yellow-breasted Chat, 1; Indigo Bunting, 0.5. **Total:** 12 species, 30 territorial males ($337/\text{km}^2$, 136/100 acres). **Remarks**

This census was funded by Niagara-Mohawk Power Corporation as part of a larger study. — JOE MCMULLEN, ROY S. SLACK (compiler), VINCENT J. LUCID and PAUL G. KALKA, *Environmental Analysts, Inc.*, 333 Crossways Park Drive, Woodbury, N. Y. 11797.

80. WHITE PINE—RED MAPLE—LEATHERLEAF BOG. — **Location:** New York; Dutchess Co., 3 miles due S of Eighmyville; 41°53'56"N, 73°51'18"W, Rock City Quadrangle, USGS, 1963. **Continuity:** New. **Size:** Ca. 8.1 ha = 20 acres. Bog proper (1.7 ha = 4.5 acres) measured into a grid of 0.25 acre units by steel tape and compass. Marginal ditch ecotone measured roughly by steel tape and compass (ca. 6.4 ha = 16 acres), not in grid. **Description of Plot:** This wetland is delineated from the woodlands on the W, N, and E and an open field on the S by a marginal ditch with standing water in spring. The principal vegetation of the ditch consists of Red Maple (*Acer rubrum*), White Pine (*Pinus strobus*), Hemlock (*Tsuga canadensis*), Yellow Birch (*Betula lutea*), Skunk Cabbage (*Symplocarpus foetidus*), and Cinnamon Fern (*Osmunda cinnamomea*). The ditch grades into a narrow ring of dense shrubs, which includes High-bush Blueberry (*Vaccinium* sp.) and Swamp Azalea (*Rhododendron viscosum*); White Pine and Virginia Chain Fern (*Woodwardia virginica*) are also represented. The bog proper is circumscribed by Virginia Chain Fern, with the principal vegetation being: *Sphagnum*, Leather-leaf (*Chamaedaphne calyculata*), White Pine, Red Maple, Gray Birch (*B. populifolia*), High-bush Blueberry, Pitcher Plant (*Sarracenia purpurea*), Sheep Laurel (*Kalmia angustifolia*), Swamp Azalea, Small Cranberry (*Vaccinium oxycoccus*), Round-leaved Sundew (*Drosera rotundifolia*), and Cotton Grass (*Eriophorum virginicum*). Many dead trees stand in this wetland. **Topography:** Flat. **Elevation:** 325 ft. **Weather:** May was unseasonably cool, with windy conditions recorded for most morning visits. Rain was frequent and heavy in late May and early June. The remainder of June was generally hot and dry. **Coverage:** May 5, 8, 11, 14, 17, 19, 25, 28, 30-31; June 2, 5, 7, 9, 11, 15, 18, 25; July 3. Visits ranged from 0500 to 1200, with two evening visits, and totaled 28 man-hours. **Census:** Gray Catbird, 4 (49, 20); Rufous-sided Towhee, 3 (37, 15); Black-capped Chickadee, 2; Nashville Warbler, 2; Com. Yellowthroat, 2; Red-winged Blackbird, 2; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Brown Creeper, 1; Veery, 1; N. Waterthrush, 1; N. Oriole, 1; Cardinal, 1; Song Sparrow, 1; Wood Thrush, 0.5; Ovenbird, 0.5; Brown-headed Cowbird, 2; **Total:** 18 species; 25 territorial males (309/km², 125/100 acres). **Remarks:** Special thanks to Erik Kiviat for advice and assistance. — NANCY ZEISING, Clinton Hollow, Salt Point, N. Y. 12578.

81. MOUNTAINTOP BOG—MIXED HARDWOOD—EVERGREEN EDGE — **Location:** Pennsylvania; Westmoreland Co., 10 miles SSW of Ligonier, 6 miles S of Laughlintown in Forbes State Forest on the top of Laurel Mountain; 40°07'20"N, 79°10'28"W, Bakersville Quadrangle, USGS. **Con-**



Census 81. Laurel Summit glade with irregular open bog Photo/R.C. Abbott.

tinuity: Established 1974. **Size:** 6.07 ha = 15 acres (rectangular, 500 x 1307 ft, with irregular open bog areas surrounded by mature edge, measured and calculated). **Description of Plot:** See AB 28: 1027, 1974. **Weather:** Two days cold, rain and windy, two days warm and clear. **Coverage:** June 7-8, 10, 14-15. Hours 0500 to 0930, 1200 to 1300 and 1700 to 1930. Total party-hours: 9. **Census:** Song Sparrow, 5 (82, 33); House Wren, 4 (66, 27); Chipping Sparrow, 4; Rufous-sided Towhee, 3 (49, 20); Dark-eyed Junco, 3; Black-capped Chickadee, 2; Solitary Vireo, 2; Com. Yellowthroat, 2; Field Sparrow, 2; Scarlet Tanager, 1.5; Am. Robin, 1; Hermit Thrush, 1; Veery, 1; Cedar Waxwing, 1; Blackburnian Warbler, 1; Canada Warbler, 1; Purple Finch, 1; Gray Catbird, 0.5; Red-eyed Vireo, 0.5; Ring-necked Pheasant, +; Com. Flicker +; Blue Jay, +; Com. Crow, +; Golden-crowned Kinglet, +; Magnolia Warbler, +; Com. Grackle, +; Rose-breasted Grosbeak, +; Am. Goldfinch, +. **Total** 28 species; 36.5 territorial males (601/km², 243/100 acres). — R. CARRELL ABBOTT *Audubon Society of Western Pennsylvania, Carnegie Museum, Pittsburgh Pa.* 15213.

82. OLD FIELD—MEADOW AND PRIMARY DECIDUOUS THICKETS. — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mile S of intersection of state route 228 and Kepple Road on Todd Sanctuary; 40°44'N, 79°42'W, Freeport Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 10.1 ha = 25 acres (measured with line and compass). **Description of Plot:** See AB 28: 1025-1026, 1974. The 25% open area which had been covered by huckleberry (*Gaylussacia* spp.), blueberry (*Vaccinium* spp.), and grass was mowed over the winter making it more a field habitat. Also about two acres of crab apples (*Pyrus* spp.) were cleared. **Weather:** Warm to hot with some rain in June and a dry July. **Coverage:** May 23-24, 28, 31; June 1-2, 8, 12, 15, 19, 29; between 0500 and 0800. Total man-hours: 25-30. **Census:** Field Sparrow, 8 (79, 32); Cardinal 5 (49, 20); Indigo Bunting, 5; Rufous-sided Towhee, 5; Red-eyed Vireo, 4.5 (44, 18); Black-capped Chickadee, 3 (30, 12); Brown-headed Cowbird, 3; Tufted Titmouse, 2.5; Ruby-throated

Hummingbird, 2; Gray Catbird, 2; Ruffed Grouse, 1; Yellow-billed Cuckoo, 1; Mourning Dove, 1; Downy Woodpecker, 1; House Wren, 1; Com. Yellowthroat, 1; Am. Goldfinch, 1; Vesper Sparrow, 1; Red-tailed Hawk, +; Screech Owl, +; Great Horned Owl, +; Great Crested Flycatcher, +; Scarlet Tanager, +. **Total** 23 species; 48 territorial males or females ($474/\text{km}^2$, 192/100 acres). **Remarks:** Field Sparrows increased from 6 to 8 territorial males. Cardinal, Black-capped Chickadee, Brown-headed Cowbird, Ruby-throated Hummingbird, and Catbird showed an increase of one. Yellow-breasted Chat, Blue-winged Warbler, and Song Sparrow were not present this year; this may be attributed to the mowing of most of the brushy areas. Nests found: Field Sparrow, 2; Black-capped Chickadee, 1; House Wren, 1. I thank Chuck Bier for his help with the field work and Donna Egbert for making the maps. G. THOMAS BANCROFT, RD 3, Cedar Run Road, Allison Park, Pa. 15101.

83. MIXED UPLAND HABITAT. — **Location:** Maryland; Montgomery Co., North Chevy Chase. **Continuity:** Established 1974. **Size:** 16.2 ha = 40 acres (oblong, surveyed). **Description of Plot:** See *Atlantic Naturalist* 24(2): 100-101, 1969. **Weather:** Generally good but with rain, hail and very high winds. **Coverage** April 13, 22; May 1, 8, 10-11, 13, 17-18, 21, 26, 28, 31; June 2, 7, 12-13, 20-21, 25; July 2, 8, 17; between 0500 and 0900 except two between 2130 and 2300 Total man-hours: 44. **Census:** Starling, 31 (192, 78); Gray Catbird, 15 (93, 38); Cardinal, 12 (74, 30); Com. Grackle, 10 (62, 25); House Wren, 8 (49, 20); Mourning Dove, 5 (31, 13); Carolina Chickadee, 5; Brown Thrasher, 4.5 (28, 11); Com. Crow, 4 (25, 10); Tufted Titmouse, 3.5 (22, 9); Blue Jay, 3 (19, 8); Carolina Wren, 3; Am. Robin, 3; House Sparrow, 3; Rufous-sided Towhee, 3; Downy Woodpecker, 2.5; Com. Flicker, 2; Wood Thrush, 2; Brown-headed Cowbird, 2 (females); Indigo Bunting, 2; Great Crested Flycatcher, 1; Mockingbird, 1; White-eyed Vireo, 1; Red-eyed Vireo, 1; Com. Yellowthroat, 1; Am. Redstart, 1; Song Sparrow, 1; Veery, 0.5; Scarlet Tanager, +. **Total:** 29 species; 131 territorial males or females ($809/\text{km}^2$, 328/100 acres). **Remarks:** Of the 23 species observed both this year and last, 6 increased their populations, 9 decreased, and 8 remained unchanged. Significant increases were: Starling (+41%), catbird (+67%), and Brown Thrasher (+125%). Significant decreases were: chickadee (-38%), titmouse (-56%), Downy (-50%), Mockingbird (-82%), robin (-50%), and towhee (-50%). Species holding territory this year but not last were: Veery, Red-eyed Vireo, Yellowthroat, redstart and Scarlet Tanager. Species holding territory last year but not this were: woodcock, Red-bellied Woodpecker, Fish Crow, and White-breasted Nuthatch. The increase of the Starling was probably the main reason for the decrease of other hole-nesters. Nests located (71): Starling, 20; grackle, 10; catbird, 9; House Wren, 8; Mourning Dove, 5; robin, 4; Cardinal, 3; House Sparrow, 3; chickadee, 2; crow, 2; Downy Woodpecker, 1; Brown Thrasher, 1; Blue Jay, 1; Wood Thrush, 1; Carolina Wren, 1. In general the nesting season was successful. — PETER B. PYLE, "Woodend," 8940 Jones Mill Rd., Chevy Chase, Md. 20015.

84. FIELD WITH HEDGEROWS. — **Location:** Tennessee; Hawkins Co., Phipps Bend, about 3.5 miles E of Surgeonsville; $36^\circ 28' \text{N}$, $82^\circ 48' \text{W}$, Stony Point Quadrangle, USGS. **Continuity:** New. **Size:** 36.5 ha = 90.27 acres (rectangular, 3072 x 1280 ft, measured with compass and 256 ft nylon string). **Description of Plot:** A 90-acre section of a field of approximately 150 acres. Most of the field was covered in a mixture of tall grasses, averaging about one m high. A shrubby area through the center accounted for approximately 20% of the plot. This center strip consisted mainly of weeds and young trees. Prominent tree species here included Box-elder (*Acer negundo*), Sycamore (*Platanus occidentalis*), and Red Cedar (*Juniperus virginiana*). These trees were generally from 4 to 6 ft tall. Blackberry vines (*Rubus* sp.) and thick herbaceous growth made this center strip more dense than the surrounding vegetation. A small wet area with bulrushes (*Scirpus* spp.) occupied about 2 acres in the NW corner. The rest of the field, with the exception of the edges, was grass-covered with occasional blackberry vines and Box elder seedlings. **Edge:** The bank of the Holston River formed the NE border. It was lined with a row of tall trees with a very dense undergrowth, about 20 to 40 ft wide. The trees were almost exclusively Box-elder and Sycamore. Thick undergrowth was formed mainly by Poison Hemlock (*Conium maculatum*), Nettle (*Urtica* sp.), Com. Elder (*Sambucus canadensis*), and seedlings of Box-elder and Sycamore. The NW border was formed by a fence with few large trees, mainly Am. Elm (*Ulmus americana*) and Box-elder. The more prominent vegetation consisted of smaller trees along with vines and weedy species which formed a narrow dense hedgerow. Trumpet Creeper (*Campsis radicans*), Winged Elm (*U. alata*), Japanese Honeysuckle (*Lonicera japonica*), blackberry and Poison Hemlock were important species in this hedgerow. A wooded hillside was located across the river at the NE border. All other parts of the plot were surrounded by fields. **Topography:** Flat to gentle rolling, elevation 1100 ft. **Weather:** Warm and wet. **Coverage 1974:** May 31; June 1-9; between 0545 and 1030, and 1750 and 2045, EDST. Total man-hours 42. **Census 1974:** Song Sparrow, 25 (68, 28); Indigo Bunting, 17 (47, 19); Field Sparrow, 16 (44, 18); Yellow Warbler, 8 (22, 9); Com. Yellowthroat, 8; Cardinal, 6.5 (18, 7); E. Meadowlark, 5 (14, 6); Red-winged Blackbird, 5; Willow Flycatcher, 4 (11, 4); Bobwhite, 3 (8, 3); Yellow-billed Cuckoo, 3; Carolina Wren, 3; Com. Grackle, 3; Orchard Oriole, 2; E. Kingbird, 1; Brown Thrasher, 1; Blue Grosbeak, 1. **Total** 17 species, 111.5 territorial males ($305/\text{km}^2$, 124/100 acres). **Remarks:** There was very little evidence of grazing on the plot at the time of the census. Nests Bobwhite, 1; Brown Thrasher, 1. Of the 111.5 total territories, 74 (65%) occurred along the river bank. This study was done as part of an Environmental Impact Statement for the Tennessee Valley Authority — RICHARD P. LEWIS, Rt. 3 Box 683B, Erwin, Tenn 37650.

85. BRUSHY FIELDS AND HOMESITE. — **Location:** Ohio; Stark Co., North Canton; 0.4 mile W of intersection of Mt. Pleasant Road and Route 241,

40°54'23"N, 81°28'9"W, North Canton Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 10.5 ha = 26 acres. **Description of Plot:** See *AB* 28: 1025-6, 1974. **Weather:** Slightly higher than normal temperatures, with lower than normal precipitation. **Coverage:** April 8, 19; May 3, 7, 9, 14, 20-21, 27, 31; June 3, 14-15; July 4, 24; from 0600 to 2230. Three night trips were taken. Total man-hours: 33. **Census:** Song Sparrow, 16 (152, 61); Field Sparrow, 12.5 (119, 48); Com. Yellowthroat, 11 (105, 42); Gray Catbird, 9 (86, 35); Red-winged Blackbird, 4 (38, 15); Am. Goldfinch, 4; Cardinal, 3.5 (33, 13); Yellow Warbler, 3 (29, 12); Am. Robin, 2.5; Starling, 2.5; House Wren, 2; Yellow-breasted Chat, 2; Com. Grackle, 2; Indigo Bunting, 2; Rufous-sided Towhee, 2; Willow Flycatcher, 1.5; Brown Thrasher, 1.5; Brown-headed Cowbird, 1.5 (females); Mallard, 1; Ring-necked Pheasant, 1; Am. Woodcock, 1; Mourning Dove, 1; Downy Woodpecker, 1; E. Phoebe, 1; Blue Jay, 1; Black-capped Chickadee, 1; Carolina Wren, 1; Swamp Sparrow, 1; Com. Flicker, 0.5; N. Oriole, 0.5; Red-tailed Hawk, +; Bank Swallow, +; Wood Thrush, +. **Total:** 33 species; 93.5 territorial males or females ($889/\text{km}^2$, 360/100 acres). **Remarks:** This year's census was influenced by two factors. In December, 24 inches of snow blanketed the plot, which crushed the shrubs, and probably will retard further progression for several years. Secondly, the owner of the plot channeled 100 yds of the creek and denuded two acres of the census area. This year's count saw the addition of 4 new species—pheasant, Mallard, oriole, and Carolina Wren. The Hairy Woodpecker was absent this year. Overall, 9 species increased; 6 declined; and 19 remained stable. The greatest declines were shown by the Song Sparrow and Yellow Warbler, which lost 4 and 3 territories, respectively. Special appreciation is extended to my father and brother, Mike, who aided me in this project. — PETER W. WILSON, 821 Pierce Avenue NW, North Canton, Ohio, 44720.

86. DISTURBED OAK—HICKORY FOREST, PINE STAND, EDGE, AND POND. — **Location:** Ohio, Licking Co., Eden Township, Camp Falling Rock, 1.2 miles NNE of the intersection of County Road 210 and Rte 79; 40°11'N, 82°18.5'W, Newark Quadrangle, USGS. **Continuity:** Established 1937; 37 intermittent years (formerly listed under five other titles, with variations.) **Size:** 14.16 ha = about 35 acres (quadrilateral, compass and tape surveyed). **Description of Plot:** See *Bird-Lore* 39: 379-380, 1937; and subsequent years. Habitat changes: Heavy, wet snowfall in mid-December broke several pine stems, bent some in a long arch, and felled others. Heavy winds took a toll of dead trees. Cut timber included several species. **Coverage:** April 10; May 15, 29; June 6-7, 10, 26; July 19, 30. Total man-hours: 40. **Census:** Acadian Flycatcher, 8 (56, 23); Wood Thrush, 8; Red-eyed Vireo, 8; Am. Robin, 5 (35, 14); Scarlet Tanager, 5; House Wren, 4 (28, 11); Cardinal, 4; Gray Catbird, 3 (21, 9); Cerulean Warbler, 3; Chipping Sparrow, 3; Ruby-throated Hummingbird, 2; E. Phoebe, 2; Tufted Titmouse, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Kentucky Warbler, 2; Mourning Dove, 1; Yellow-billed



Census 86. Heavy snows bent or felled several pines
Photo/A.H. Claugus.

Cuckoo, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Cedar Waxwing, 1; Am. Redstart, 1; Brown-headed Cowbird 1; Rose-breasted Grosbeak, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Song Sparrow, 1. **Total:** 35 species; 82 territorial males or females ($579/\text{km}^2$, 234/100 acres) **Remarks:** A first nesting was recorded for the Rose-breasted Grosbeak. The absence of E. Wood Pewees and the reduced population of Cerulean Warblers was puzzling. A total of 35 nests was located; 35 species made up the breeding population. Two cowbird eggs were found in one Red-eyed Vireo nest. Mortality and predation were believed to be normal. — A. H CLAUGUS, 228 S. Lake St., Carey, Ohio, 43316.

87. GRASSY MARSH-DECIDUOUS FOREST —
Location: Ohio; Stark Co., 0.5 mile NE of Hartville, Ohio; 40°58'N, 81°19'W, Hartville Quadrangle, USGS **Continuity:** Established 1974. **Size:** 8.26 ha = 20 4 acres (rectangle 130 x 760 yards, surveyed). **Description of Plot:** See *AB* 28: 1026-7, 1974. **Weather:** Normal. A heavy rain in a very short period of time on June 22 caused a flash flood in the marsh. Two feet of water was in an area normally almost dry at that time. **Coverage:** April 28, 30; May 6, 8, 12-14, 21-24, 26-27; June 1, 4, 6, 18, 20, 29; July 7, 12; between 0630 and 1030 Total man-hours: 28. **Census:** Song Sparrow, 9 (109, 44); Red-winged Blackbird, 6 (73, 29); Cardinal, 5 (61 25); House Wren, 5; Am. Robin, 4 (48, 20); Mourning Dove, 3 (36, 15); Gray Catbird, 3; Brown-headed Cowbird, 3; Am. Goldfinch, 3; Wood Thrush, 2.5; E. Wood Pewee, 2; Blue Jay, 2; Black-capped Chickadee, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Red-eyed Vireo, 2; Com. Yellowthroat, 2; Scarlet Tanager, 2; Indigo Bunting, 2; Field Sparrow, 2; Downy Woodpecker, 1.5; Brown Thrasher, 1; House Sparrow, 1; Rufous-sided Towhee, 1; Com. Flicker, 0.5; Starling, 0.5; Com. Grackle, 0.5; Green Heron, +; Wood Duck, +; Red-tailed Hawk, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Great Crest Flycatcher, +; Acadian Flycatcher, +; N. Oriole, +; Rose-breasted Grosbeak, +; Chipping Sparrow, +. **Total:** 37 species; 71.5 territorial males ($866/\text{km}^2$, 350/100 acres)

100 acres). **Remarks.** Nests found. House Wren, 3, Am Robin, 2; Mourning Dove, 1; Black-capped Chickadee, 1; Starling, 1; House Sparrow, 1; Com. Grackle, 1, Cardinal, 1. Several species showed a decline in number compared with last year. — JOAN E. ESPENSCHIED, 3056 Swamp St., Hartville, Ohio 44632.

88. HICKORY-MAPLE PARK WOODLAND. —

Location: Ohio; Guernsey Co., approximately $\frac{1}{4}$ mile from the registration station for the camping area of Salt Fork State Park; $40^{\circ}6'18''N$, $81^{\circ}30'8''W$, Cambridge Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (rectangular 1980 x 330 ft, measured longitudinally and estimated laterally). **Description of Plot** The dominant canopy trees are Sugar Maple (*Acer saccharum*) and Mockernut Hickory (*Carya tomentosa*). Most prominent in the understory are Poison Ivy (*Rhus radicans*) and blackberries (*Rubus* sp.). Among the ground cover plants are many ferns including Christmas Fern (*Polystichum acrostichoides*) and Rattlesnake Fern (*Botrychium virginianum*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 214/acre; total basal area 68 ft²/acre. Species comprising 92% of the total number of trees: Sugar Maple, 25, 12, 13, 67; Mockernut Hickory, 18, 8, 12, 50; Red Oak (*Quercus rubra*), 8, 4, 9, 33; Red Elm (*Ulmus rubra*), 35, 16, 8, 83; Am. Elm (*U. americana*), 23, 11, 8, 67; White Oak (*Q. alba*), 7, 3, 6, 50. Am. Hornbeam (*Carpinus caroliniana*), 27, 13, 4, 67; Black Cherry (*Prunus serotina*), 13, 6, 4, 67; Black Oak (*Q. velutina*), 12, 6, 3, 17; Shagbark Hickory (*C. ovata*), 10, 5, 4, 17; dead trees, 17, 8, 24, 67. Trees by diameter size class: A (3-6 in.) 130, 60, 13, 19, B (6-9 in.) 55, 26, 17, 25; C (9-15 in.) 22, 10, 17, 25, D (15-21 in.) 5, 2, 9, 13; G (33-40 in.) 2, 1, 12, 18. Shrub stems/acre 4758; ground cover 74.6%; canopy cover 85%; average canopy height 70 ft (range 48-82). **Edge:** Bordered on one side by similar habitat and on the other by young deciduous brushland about 25 ft high. **Topography:** Centerline of the plot is essentially E-W, following the N slope of a hill for half the length and following a stream between hills for the other half. **Elevation:** From 980 to 880 ft. **Weather:** Hot and humid with thundershowers every afternoon. **Coverage:** May 24-29; 10 trips between dawn and 0900, the others at dusk. Total 17 trips, 13 party-hours. **Census:** Red-eyed Vireo, 6 (99, 40); Acadian Flycatcher, 5.5 (91, 37); Cerulean Warbler, 3 (49, 20); Indigo Bunting, 3; Cardinal, 2.5; E. Wood Pewee, 2; Blue-gray Gnatchatcher, 2; Rufous-sided Towhee, 2; Wood Thrush, 1.5; Yellow-throated Vireo, 1.5; Blue-winged Warbler, 1.5; Great Crested Flycatcher, 1; Carolina Chickadee, 1; Tufted Titmouse, 1; House Wren, 1; Carolina Wren, 1; Louisiana Waterthrush, 1; Kentucky Warbler, 1; Scarlet Tanager, 1; Field Sparrow, 1; Yellow-breasted Chat, 0.5; Turkey Vulture, +; Broad-winged Hawk, +; Ruffed Grouse, +; Whippoor-will, +; Ruby-throated Hummingbird, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Downy Woodpecker, +; Blue Jay, +; White-breasted Nuthatch, +; Am. Redstart, +; Brown-headed Cowbird, +; Am. Goldfinch, +. **Total:** 34 species; 40

territorial males (659/km², 267/100 acres). **Remarks** Two nests were located: Blue-gray Gnatchatcher and E Wood Pewee. This study was undertaken in the camping area of a state park along a hiking trail that is used by the public. — GREG and ANN EDDY and GLEN PHILLIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

89. SEEDED STRIP MINE. — Location West

Virginia, Raleigh Co. about 5 miles SE of Shady Springs. The centerline starts at $37^{\circ}40'48''N$, $81^{\circ}01'34''W$, Shady Springs Quadrangle, USGS, and extends SW. **Continuity:** New. **Size:** 11.1 ha = 27.5 acres (rectangular, measured longitudinally and estimated laterally). **Topography:** Level at 2800 ft **Description of Plot:** A portion of a strip mining operation which girds White Oak Mountain about 100 ft below the crest. The area was stripped for coal in 1970 and reclamation began the following spring. Tall grasses dominate the vegetation except for a row of Russian Olive (*Elaeagnus angustifolia*) which extends the full length of the plot and a few Black Locust (*Robinia pseudo-acacia*) which have reached the height of about 5 ft. The ground cover is composed of Canada Blue Grass (*Poa compressa*), Orchard Grass (*Dactylis glomerata*), Meadow Fescue (*Festuca elatior*), Hairy Vetch (*Vicia villosa*), Dwarf Plantain (*Plantago Virginica*) and Com. Ragweed (*Ambrosia artemisiifolia*). Two small plots about 20 x 50 ft are planted in corn **Edge:** Bounded on the W by a 20 ft high wall ascending to the edge of the forest. The E edge terminates in a steep drop off caused by the leveling of the land. Access is by a road which runs through the entire plot and was used as the centerline. Crowns and stumps of the trees removed prior to the stripping remain along the road just before entering the study plot. The strip mine continues on around the mountain with undisturbed forest land on both sides. **Weather:** Seasonably warm and dry throughout the period. **Coverage:** May 31, June 1-5; between 0600 - 1050. **Total man-hours:** 14 **Census:** Vesper Sparrow, 2; Field Sparrow, 2; Com Flicker, 1; Rough-winged Swallow, 1; Indigo Bunting, 1; Song Sparrow, 1; Rufous-sided Towhee, 0.5; Chipping Sparrow, +. **Total:** 8 species; 8.5 territorial males (76/km², 31/100 acres). **Remarks:** Nests found Com Flicker and Rough-winged Swallow. This study plot is typical of strip mining operations in Raleigh County where most of the mining operations are located near the crest of the mountains with undisturbed forest land on both sides. This particular plot is planted for wildlife. — NEVADA LAITSCH (compiler) Brooks Bird Club, 707 Warwood Ave., Wheeling, W Va 26003.

90. DECIDUOUS CLEARCUT. — Location Tennessee;

Washington Co.; Horse Cove Gap; about 4.5 miles S of Johnson City; $36^{\circ}14'N$, $82^{\circ}22'W$, Erwin Quadrangle, USGS. **Continuity:** New. **Size:** 20.23 ha = 50 acres (irregular, acreage determined by dot grid) **Description of Plot:** The area was clearcut in the spring and summer of 1974. A dirt road winds through the area. Vegetation consists predominantly of seedlings and stump sprouts. Fallen trees and brush made walking through the area extremely difficult, therefore a quanta-

tive survey of the vegetation was not made. The most abundant tree seedlings and sprouts are Red Maple (*Acer rubrum*), Tulip-tree (*Liriodendron tulipifera*), and Black Locust (*Robinia pseudo-acacia*). Present but less prominent are White Pine (*Pinus strobus*), Sourwood (*Oxydendrum arboreum*), White Oak (*Quercus alba*), Black Oak (*Q. velutina*), N. Red Oak (*Q. borealis*), *Sassafras albidum*, hickory (*Carya spp.*), and Am. Chestnut (*Castanea dentata*). Prominent shrubby species include Rosebay Rhododendron (*Rhododendron maximum*), Mountain Laurel (*Kalmia latifolia*), Pokeweed (*Phytolacca americana*), and blackberry (*Rubus sp.*). White Pine was planted by the Forest Service. A small isolated stand of trees in the western half was about 100 ft in diameter and included Red Maple, White Oak, Black Oak, Umbrella tree (*Magnolia fraseri*), and hickory. Flowering Dogwood (*Cornus florida*), Rosebay Rhododendron, and Mountain Laurel were present in the understory. **Edge:** Surrounded by a mature hardwood forest. The census was not conducted within 50 ft of the forest edge. **Topography:** On the SE slope of a ridge. The elevation varied from 2240 to 2560 ft. **Weather:** Warm and wet. About 1 4 inches of rain for the 8-day census period. **Coverage:** May 30-31; June 1-6; between 0600 and 0745. Total man-hours: 9.5. **Census:** Indigo Bunting, 9 (44, 18), Rufous-sided Towhee, 6 (30, 12); Carolina Wren, 5 (25, 10); Yellow-breasted Chat, 4 (20, 8); Cardinal, 2, Ruby-throated Hummingbird, 1; E. Wood Pewee, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Black-and-white Warbler, 1; Prairie Warbler, 1; Hooded Warbler, 1, Scarlet Tanager, +. **Total:** 13 species; 33 territorial males (163/km², 66/100 acres). **Remarks:** Thanks to the U. S. Forest Service (Unaka Ranger Dist.) for information concerning the acreage of the clearcut. — RICHARD P. LEWIS, and ALAN B. SMITH, 7017 Northshore Drive, Knoxville, Tenn. 37919

91. MIXED DECIDUOUS-PINE AND PASTURE-LAND. — **Location:** Mississippi; Oktibbeha Co., Mississippi State University South Farm, 3 miles SW of the main campus. **Continuity:** Established 1971; 5 consecutive years. **Size:** 11.7 ha = 29 acres. **Description of Plot:** See AB 27: 988-989, 1973. **Weather:** Temperature ranged from 52 to 91°F; 8 count days had clear skies, 5 had scattered clouds, and 2 were overcast. **Coverage:** May 10-June 15; 15 trips of 2 hours each, ranging from 0600 to 2000 hours, CST. **Total:** 30 man-hours. **Census:** Red-winged Blackbird, 12 (102, 41), Com. Grackle, 10 (85, 34); E. Meadowlark, 9 (77, 31), Mourning Dove, 8 (68, 28); Killdeer, 7 (60, 24); Blue Jay, 7; E. Kingbird, 6 (51, 21); Bobwhite, 5 (43, 17), Com. Nighthawk, 4 (34, 14); Chimney Swift, 4; Mockingbird, 4; House Sparrow, 4; Cardinal, 4; Rufous-sided Towhee, 4; Red-bellied Woodpecker, 3 (26, 10); E. Wood Pewee, 3; Barn Swallow, 3; Carolina Chickadee, 3; Brown Thrasher, 3; Indigo Bunting, 3; Field Sparrow, 3; Rock Dove, 2; Yellow-billed Cuckoo, 2; Great Crested Flycatcher, 2; Com. Crow, 2; Tufted Titmouse, 2; Am. Robin, 2; Red-eyed Vireo, 2; Green Heron, 1; Am. Kestrel, 1; Screech Owl, 1, Chuck-will's-widow, 1; Com. Flicker, 1; Red-headed Woodpecker, 1; Carolina Wren, 1; Gray Cat-

bird, 1, Blue-gray Gnatcatcher, 1; Loggerhead Shrike, 1; Pine Warbler, 1; Orchard Oriole, 1; Summer Tanager, 1; Turkey Vulture, +; Red-tailed Hawk, +. **Total:** 43 species; 136 territorial males (1159/km², 469/100 acres). — JAMES N. SAPPINGTON, Dept. of Zoology, Mississippi State Univ., Mississippi State, Miss. 39762.

92. ARBORETUM. — **Location:** Louisiana, Lincoln Parish, Ruston; School of Forestry, Louisiana Tech University Arboretum; S of Reese Hall and U S Highway 80, 32°31'N, 92°39'W (sec 35, T 18N, R3W). **Continuity:** New. **Size:** 14.6 ha = 36 acres (irregular, roughly rectangular, approximately 1200 x 1900 ft). **Description of Plot:** See AB 29: 1975. The 14-acre lake was not included. **Weather:** Temperatures were in the 60s and 70s°F. Wind speeds varied between 2 and 11 mph. Four counts were conducted with cloud cover 0-10% and four with cloud cover greater than 85%. **Coverage:** May 4, 8, 10, 17-18, 22-24; between 0603 and 1005 hours. Total man-hours: 17. **Census:** Red-winged Blackbird, 19 (130, 53); Mockingbird, 10 (69, 28); Brown Thrasher, 7.5 (51, 21); Orchard Oriole, 7 (48, 19); E. Meadowlark, 4.5 (31, 13), Cardinal, 4.5; Bobwhite, 4 (27, 11); Carolina Wren, 4, Mourning Dove, 3 (21, 8); Blue Jay, 3; Loggerhead Shrike, 3; White-eyed Vireo, 3; Com. Grackle, 3, Yellow-billed Cuckoo, 2.5; Am. Robin, 2; N. Oriole, 2; Red-headed Woodpecker, 1.5; Great Crested Flycatcher, 1.5; E. Kingbird, 1; E. Wood Pewee, 1; Rough-winged Swallow, 1; Gray Catbird, 1; Starling, 1; Kentucky Warbler, 1; Com. Yellowthroat, 1, Red-bellied Woodpecker, 0.5. **Total:** 26 species; 92.5 territorial males or females (635/km², 257/100 acres) **Remarks:** Nests located: Brown Thrasher, 16, Red-winged Blackbird, 12; Mockingbird, 8; Loggerhead Shrike, 7; Mourning Dove, 5; Cardinal, 5; Am. Robin, 3; Blue Jay, 2; Bobwhite, 2; E. Meadowlark, 2, Red-bellied Woodpecker, 1; E. Kingbird, 1; Rough-winged Swallow, 1; Orchard Oriole, 1; Com. Grackle, 1. Grass mowing during the breeding season limited ground nesting birds. — JAMES G. DICKSON, School of Forestry; JOHN W. GOERTZ, Dept. of Zoology, Louisiana Tech Univ., Ruston, La. 71270.

93. IMPOUNDED BAYOU-GUM-OAK-BEECH FOREST. — **Location:** Louisiana; Evangeline Parish, Miller's Lake; 15.9 km NW of Ville Platte. The S boundary is 1.8 km N of the west Miller's Lake spillway; 30°46'N, 92°23'W, Section 45, T3S, R1E, Turkey Creek, La. Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (20,000 x 50 m, measured longitudinally and estimated laterally). **Description of Plot:** Composed of two habitats. One is bayou (19%), the other is gum-oak-beech forest on the bayou's natural banks; located within a 1300+ ha man-made lake. A quantitative survey based on 100 randomly located .01 ha (radius = 5.6 m) circular plots gave the following results: 704 trees/ha with a dbh 7.5 cm and over; basal area, 26.6 m²/ha. Overstory species are Sweet-gum (*Liquidambar styraciflua*), 47%; Blue-beech (*Carpinus caroliniana*), 14%; Water Oak (*Quercus nigra*), 12%; Carolina Ash (*Fraxinus caroliniana*), 8%; Laurel Oak (*Q. laurifolia*), 2%; and Red Maple

(*Acer rubrum* var. *drummondii*), 2%. Predominant in the understory is Blue-beech, Com. Buttonbush (*Cephaelanthus occidentalis*), Giant Cane (*Arundinaria gigantea*), green brier (*Smilax spp.*), grape (*Vitis spp.*), and Rattan-vine (*Berchemia scandens*). **Topography:** Flat, elevation 22.9 m. **Edge:** Surrounded by a 120 ha Carolina Ash swamp. Water: The average depth of the bayou is 1.5 m; 35% of the remainder of the plot is covered by 0.15 m of water. **Weather:** The temperature ranged from 20 to 35°C, cloud cover average 15%, and the wind average 8 km/hr. The rainfall was 8.9 cm. **Coverage:** June 3, 5, 8, 13, 19-20; between 0625 and 0920 averaging 140 minutes each. **Census:** Prothonotary Warbler, 28 (280, 113); Cardinal, 26 (260, 105); White-eyed Vireo, 18 (180, 73); Blue-gray Gnatcatcher, 12 (120, 49); N. Parula, 12; Green Heron, 11 (110, 45); Carolina Wren, 11; Carolina Chickadee, 7 (70, 28); Wood Thrush, 7; Brown-headed Cowbird, 7; Acadian Flycatcher, 6 (60, 24); Yellow-billed Cuckoo, 5 (50, 20); Red-bellied Woodpecker, 4 (40, 16); Hooded Warbler, 4; Tufted Titmouse, 3 (30, 12); Swainson's Warbler, 3; Downy Woodpecker, 2 (20, 8); Blue Jay, 2; Red-eyed Vireo, 2; Am. Redstart, 2; Yellow-crowned Night Heron, 1; Barred Owl, 1; Ruby-throated Hummingbird, 1; Pileated Woodpecker, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Rufous-sided Towhee, 1. **Total:** 29 species; 181 territorial males (1810/km², 732/100 acres). — BRENT ORTEGO and ROBERT B. HAMILTON, School of Forestry and Wildlife Management, Louisiana State Univ., Baton Rouge, La. 70803.

94. MIXED PRAIRIE GRASSLAND. — **Location:** Montana; Richland Co., 5 miles W of Savage; 47°26'N, 104°26'W; S28, T20N, R57E. **Continuity:** New. **Size:** 8 1 ha = 20 acres (rectangular, 201 x 402 m, paced). **Description of Plot:** Grazed quite heavily by cattle the preceding fall leaving little significant ground cover

except for clumps of Little Bluestem (*Andropogon scoparius*). Vegetation of relatively level portions of the area varies considerably from that found in the steep draws which dissect the area. Common grasses of level uplands and upper slopes are: Needle-and-thread (*Stipa comata*), Little Bluestem, Sideoats Grama (*Bouteloua curtipendula*), Plains Muhly (*Muhlenbergia cuspidata*), and Bluebunch Wheat grass (*Agropyron spicatum*) Important grasses in the bottoms of the draws where dense grass cover often occurs are: W. Wheat grass (*A. smithii*), Kentucky Blue Grass (*Poa pratensis*), and Green Needle Grass (*S. viridula*). There is also a small patch (about one-half acre) of Crested Wheat Grass (*A. cristatum*), which has been seeded along the N edge of the area. Woody species are confined to a few very small patches of W. Snowberry (*Symporicarpus occidentalis*), Wood's Rose (*Rosa woodsii*), and Creeping Juniper (*Juniperus horizontalis*). **Edge:** Bounded on three sides by similar habitat; however, on the W a cultivated field lies about 30 m beyond the edge; on the E spoil piles and the cut of strip mining operations lie about 15 m away at the N end and 90 m at the S end, bounded on the S by cultivated field. **Topography:** Deeply dissected by several draws. **Elevation:** 2300 to 2360 ft. **Weather:** Temp. varied from 37 to 85°F, cloudy to clear. Unusually heavy rains through spring to mid-June. **Coverage:** May 5, 28-30; June 23-25, between 0500 and 2100 hours. Total man-hours 30 **Census:** Horned Lark, 4 (49, 20); W. Meadowlark, 2, Lark Bunting, 2; Grasshopper Sparrow, 2; Vesper Sparrow, 1.5; Chestnut-collared Longspur, 1.5; Lark Sparrow, 0.5. **Total:** 7 species; 13.5 territorial males (167/km², 68/100 acres). **Remarks:** This area will eventually be strip mined for lignite coal and the census was made as part of an environmental impact study. Thanks to the Knife River Coal Mining Company for the opportunity of making the study. — ROBERT N. RANDALL, 928 N. 16th St., Bismarck, N. D. 58501.

BREEDING BIRD POPULATIONS OF SELECTED GRASSLANDS IN EAST-CENTRAL NORTH DAKOTA — 1975.

The following six censuses are on various grasslands on the Woodworth Station, Northern Prairie Wildlife Research Center, U. S. Fish and Wildlife Service, located 2 miles E of Woodworth, in Stutsman County, N. D. It lies within the Coteau du Missouri, a morainal belt, usually 15 - 30 miles wide, that traverses the state in a NW to SE direction. The terrain is hilly, with an abundance of wetlands in the depressions. Precipitation records are kept at the Woodworth Station, but the nearest temperature station is at Pettibone, North Dakota, 13 miles W of the study area. Precipitation totaled 1.82 inches in May and 8.51 inches in June. Temperatures in May were slightly above normal, with an average high of 66° and a average low of 42°F. June was very near normal, with average extremes of 52 to 75°F. All censuses were made in periods of low winds. Storms in late winter and early spring restored nearly all wetlands to full capacity; they were maintained that way by frequent rains throughout the May-June period. — DOUGLAS H. JOHNSON, U. S. Fish and Wildlife

Service, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401.

95. KENTUCKY BLUE GRASS PRAIRIE. — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 12, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 4.84 ha = 12 acres (rectangular, 201 x 241 m, paced). **Description of Plot:** See AB 26: 972, 1972 Following a prescribed burn in the fall of 1972, the vegetation has continued to grow and the ground litter accumulate. The plot remains nearly devoid of shrubby vegetation. **Coverage:** May 28-29; June 2-3, 6, 17-18, between 0625 and 1140 hours, CDT. Total man-hours 3.8. **Census:** Bobolink, 2; Savannah Sparrow, 2, Blue-winged Teal, 1.5; Red-winged Blackbird, 1.5, W Meadowlark, 1; Brown-headed Cowbird, 1 (female), Gadwall, +; Am. Coot, +; Killdeer, +; Upland Sandpiper, +; Marbled Godwit, +; E. Kingbird, +, Sharp-tailed Sparrow, +. **Total:** 13 species; 9 territo-

rial males or females ($186/\text{km}^2$, $75/100$ acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401.

96. MIXED PRAIRIE (I). — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 11, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 10 ha = 24.7 acres (square, 316 m, paced). **Description of Plots** See AB 26: 972, 1972. **Coverage:** May 29; June 2-3, 6, 17-18; July 8; between 0625 and 1140 hours, CDT. Total man-hours: 7.1. **Census:** Clay-colored Sparrow, 7 (70, 28); Red-winged Blackbird, 5.5 (55, 22); Blue-winged Teal, 5 (50, 20); Com. Yellowthroat, 5; Gadwall, 2; N. Shoveler, 2; Am. Coot, 2; W. Meadowlark, 2; Brown-headed Cowbird, 2 (females); Bobolink, 1.5; Savannah Sparrow, 1.5; Willow Flycatcher, 1; Yellow Warbler, 1; E. Kingbird, 0.5; Mallard, +; Sharp-tailed Grouse, +; Com. Snipe, +; Gray Catbird, +; Brown Thrasher, +. **Total:** 19 species; 38 territorial males or females ($380/\text{km}^2$, 154/100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401

97. MIXED PRAIRIE (II). — **Location:** North Dakota, Stutsman Co., SW quarter of Sect. 1, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, surveyed). **Description of Plot** See AB 26: 972-973, 1972. After a prescribed burn in the fall of 1971, the vegetation growth has continued. Shrubs, restricted to certain areas, have regained their normal stature and litter has accumulated throughout the plot. **Coverage:** June 3-6, 17-18; July 8; between 0650 and 0935 hours, CDT. Total man-hours: 3.4. **Census:** Red-winged Blackbird, 5 (82, 33); Blue-winged Teal, 2; Bobolink, 2; Am. Coot, 1; W. Meadowlark, 1; Brown-headed Cowbird, 1 (female); Killdeer, +; E. Kingbird, +; Clay-colored Sparrow, +. **Total:** 9 species; 12 territorial males or females ($197/\text{km}^2$, 80/100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401.

98. MIXED PRAIRIE (III). — **Location:** North Dakota; Stutsman Co., NW quarter of SW quarter of Sect. 6, T142N, R67W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, paced). **Description of Plot:** See AB 26: 973, 1972. This plot, burned fall 1970, was subjected to another prescribed burn May 13, 1975. The fire left most shrubs devoid of foliage and eliminated much of the litter that had accumulated since the 1970 fire. **Coverage:** May 28-29; June 2-3, 6, 17; between 0555 and 1200 hours, CDT. Total man-hours: 2.3. **Census:** W. Meadowlark, 1.5; Clay-colored Sparrow, 0.5; Blue-winged Teal, +; Am. Coot, +; Killdeer, +; Upland Sandpiper, +; E. Kingbird, +; Red-winged Blackbird, +; Brown-headed Cowbird, +. **Total:** 9 species, 2 territorial males ($33/\text{km}^2$, 13/100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401.

99. MIXED PRAIRIE (IV). — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 11, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, paced). **Description of Plot:** See AB 26: 973, 1972. Following a prescribed burn in fall, 1972, plant growth has continued. Shrubby vegetation has returned to its former stature and litter has begun to accumulate. **Coverage:** June 2-3, 6, 18, July 8; between 0655 and 1020 hours, CDT. Total man-hours: 3.9. **Census:** Red-winged Blackbird, 4 (66, 27); Bobolink, 2; Savannah Sparrow, 1.5; Clay-colored Sparrow, 1.5; Blue-winged Teal, 1; Am. Coot, 1; W. Meadowlark, 1; Brown-headed Cowbird, 1 (female); N. Shoveler, 0.5; Gadwall, +; Upland Sandpiper, +; E. Kingbird, +; Com. Yellowthroat, +. **Total:** 13 species, 13.5 territorial males or females ($222/\text{km}^2$, 90/100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401

100. MIXED PRAIRIE (V). — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 12, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 4 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. **Coverage:** May 29; June 2 (2 trips), 3 (2); 6 (2); 17-18; July 8; between 0610 and 1045 hours, CDT. Total man-hours: 4.2. **Census:** Bobolink, 2.5; W. Meadowlark, 1.5; Red-winged Blackbird, 1; Brown-headed Cowbird, 0.5 (female); Blue-winged Teal, +; Marbled Godwit, +; E. Kingbird, +; Willow Flycatcher, +; Loggerhead Shrike, +; Grasshopper Sparrow, +. **Total:** 10 species, 5.5 territorial males or females ($90/\text{km}^2$, 37/100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N. D. 58401

101. MID-GRASS PRAIRIE — **Location:** South Dakota; Custer Co., Wind Cave National Park, $43^{\circ}53'N$, $103^{\circ}23'W$. **Continuity:** New. **Size:** 40 ha = 98.8 acres (square, Brunton-pace survey). **Description of Plot:** Grasses dominant: *Agropyron smithii* (25% cover); *Stipa comata* (5% cover); *Poa pratensis* (20% cover); *Bromus japonicus* (15% cover); *Stipa viridula* (10% cover); *Andropogon scoparius* (15% cover). Important forbs are *Artemisia frigida* (1% cover) and *Petalostemon purpureum* (2% cover); other forbs (8% cover). **Edge:** Similar on all sides. **Topography:** Rolling with 6 to 30% slope. **Elevation:** 1121 m. **Weather:** Of the 8 trips, 5 were clear, 2 were partly cloudy and 1 was cloudy. The average temperature was 17°C with the average wind of 1.4 m/sec. **Coverage:** June 10, 16, 20, 23, 26-27, 30; July 1. Six counts at 0630; two at 1930 Total man-hours: 32. **Census:** Grasshopper Sparrow, 34 (85, 35); W. Meadowlark, 12 (30, 12); Com. Night-hawk, +. **Total:** 3 species; 47 territorial males ($118/\text{km}^2$, 48/100 acres). **Remarks:** Thanks to Al Lovaas, Kim Eckert and Brent Haglund for assistance with this census. This study was supported by NSF URP Grant No. EPP75-04279 to Augustana College. — DAVE R. JOHNSON, Biology Dept., Augustana College, Sioux Falls, S. D. 57102.

102. PRAIRIE DOG TOWN. — **Location:** South Dakota; Custer Co., Wind Cave National Park; 43°34'N, 103°24'W. **Continuity:** New. **Size:** 40 ha = 98.8 acres (square, Brunton-pace survey). **Description of Plot:** Forbs and bare ground on 67% of plot. *Asclepias pumila*, *Opuntia polyacantha*, and *Helianthus annuus* were dominant forbs. Remainder of plot in grass patches including: *Bromus tectorum* and *B. japonicus* (15% cover); *Andropogon scoparius* (10% cover), and *Aristida longisetosa* (8% cover). **Edge:** Similar on all sides. **Topography:** Primarily flat with 2 to 6% slope. **Elevation:** 1121 m. **Weather:** Of the 8 censuses, 5 were under clear skies, 2 were partly cloudy and 1 was cloudy. The average temperature was 16°C and wind speed averaged 2.3 m/sec. **Coverage:** June 9, 17, 18, 20, 23, 26-27; July 1. Six counts at 0630; two at 1930. Total man-hours: 31. **Census:** W. Meadowlark, 8 (20, 8); Grasshopper Sparrow, 8. **Total:** 2 species; 16 territorial males (40/km², 16/100 acres). **Visitor:** Burrowing Owl. **Remarks:** Grasshopper Sparrow territories were situated in areas sparsely populated by prairie dogs. W. Meadowlarks territories were observed on heavily populated areas. The prairie dog town was frequently grazed by pronghorns, bison, elk and frequented by coyotes. Thanks to Al Lovaa, Kim Eckert and Brent Haglund for assistance with this census. This study was supported by NFS URP Grant No. EPP75-04279 to Augustana College. — DAVE R. JOHNSON, Biology Dept., Augustana College, Sioux Falls, S. D. 57102.

103. FLOODPLAIN TALLGRASS PRAIRIE. — **Location:** Kansas; Douglas Co., portion of Baker Wetlands Research Area (Baker Univ., Baldwin City). It occupies much of the NW ¼, SW ¼, Section 18, T-13N, R-20E, Lawrence East Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 10.1 ha = 25 acres (square, measured). **Description of Plot:** See AB 28: 1031-1032, 1974. **Weather:** Precipitation during the study period was near average. Mean temperature during census hours was 70.1°F (range 56-88°). **Coverage:** May 27-30; June 11-14. Six visits between 1830 and 1930 and three between 0730 and 0900, CDT. Total man-hours: 23. **Census:** Dickcissel, 14 (138, 56); Red-winged Blackbird, 7 (69, 28); Com. Yellowthroat, 5 (49, 20); E. Meadowlark, 4 (40, 16). **Total:** 4 species; 30 territorial males (297/km², 120/100 acres). **Remarks:** Nests found: Red-winged Blackbird 4, Dickcissel 3, Com. Yellowthroat 1. None of the Dickcissel nests were parasitized by cowbirds this year in contrast to the 68% last year. Dickcissels showed an increase of 4 territorial males over that recorded in 1974. Yellowthroats also increased slightly. Predation accounted for nearly all nest losses. Our thanks to Ivan Boyd for permission to use this area for study and to Peter Lowther for his assistance. — JOHN T. PAUL and CALVIN L. CINK, Museum of Natural History, Univ. of Kansas, Lawrence, Kan. 66045.

104. VIRGIN TALLGRASS PRAIRIE. — **Location:** Oklahoma, Washington Co., from the intersection of US 75 and Oklahoma 23A at the S edge of Bartlesville, 1 mile S and 3 miles E and ½ mile S; center at 36°41'18"N, 95°52'30"W, Bartlesville South Quadrangle, 7.5 min. series USGS, within section 36-26-13

Continuity: Established 1974. **Size:** 68.8 ha = 170 acres (irregular rectangle, approx. ¼ x ¾ mi., measured using aerial photo). **Description of Plot:** See AB 28: 1032-1033, 1974. **Weather:** Unusually cool, wet, windy period. **Coverage:** April 21, 25, 30; May 3, 12, 19; June 12; between dawn and 0945 hours. Total man-hours: 20. **Census:** Grasshopper Sparrow, 73 (106, 43); Dickcissel, 61 (89, 36); E. Meadowlark, 32 (47, 19); Red-winged Blackbird, 7 (10, 4); Brown-headed Cowbird, 4 (6, 2); Greater Prairie Chicken (female), 2; Killdeer, 2; Upland Sandpiper, 2; Horned Lark, 2; Field Sparrow, 2; Bobwhite, 1; Scissor-tailed Flycatcher, 1; E. Kingbird, 1; Bell's Vireo, 1; Orchard Oriole, 1. **Total:** 15 species; 192 territorial males or females (279/km², 113/100 acres). **Remarks:** Two nests were located: E. Meadowlark and Red-winged Blackbird (with 1 cowbird egg). More extensive cattle grazing during the winter months following last year's summer drought reduced the height and density of the grass cover particularly on the high ridge. This probably accounted for Upland Sandpiper and Horned Lark presence. These two species plus Bobwhite increased the number of species, but totals of major inhabitants except E. Meadowlark were down probably because of the greater use of the plot for cattle forage, the cold wet spring and the reduced height and density of the grasses. — DOTTY M. GOARD, 2117 S. Dewey, Bartlesville, Okla. 74003.



Census 103. Floodplain Tallgrass Prairie census plot.

105. DISTURBED MIXED PRAIRIE. — **Location:** Illinois; Grundy Co., Goose Lake Prairie State Park, near Morris; bordered on the W by the Elgin, Joliet and Eastern Railroad, on the N by Collins Road, and to the S and E by similar prairie: 41°23'N, 88°18'W, Minooka Quadrangle, USGS. **Continuity:** New. **Size:** 16 ha = 39.5 acres (trapezoidal, nearly square 400 x 401 m). Western half of Block 1 taken from the Master Plan for the management of the park. **Description of Plot:** Area has been severely disturbed by being grazed and the foundation of several homesites can still be seen. Alternating bands of trees/shrubs and grass/forbs broken by two pot-holes (20-30 m dia.), one slough (390 m long) and three Black Willow (*Salix*

nigra) thickets (totaling approx 465 m²) of an estimated 250,000 total shrubs, or 46/acre (not added to the following tree count): Shrubs A (1-3 in.) 51/acre, trees B (over 3 in.) 10/acre. Largest tree Silver Maple (*Acer saccharinum*) 40 in. dia. Hawthorne (*Crataegus* spp.) A 24/acre, B 0.1/acre; Silver Maple A 4/acre, B 4/acre; Black Willow A 7/acre, B 0.5/acre; Black Cherry (*Prunus serotina* A 3/acre, B 2/acre; Box Elder (*Acer negundo*) A 3/acre, B 1/acre; Hackberry (*Celtis occidentalis*) A 2/acre, B 1/acre; Peach Leaf Willow (*Salix amygdaloides*), White Ash (*Fraxinus americana*), and Cottonwood (*Populus deltoides*) present in small numbers. Dead trees: 7 upright, 6 fallen. Grasses/Forbs: Six major grasses identified, predominantly Little Bluestem (*Andropogon scoparius*), Downy Chess (*Bromus tectorum*), Perennial Rye Grass (*Lolium perenne*), Side Oats Gamma Grass (*Bouteloua curtipendula*) and Indian Grass (*Sorghastrum nutans*); 57 species forbs identified, mostly wet and mesic, with Mountain Mint (*Pycnanthemum virginianum*) and Lance-leaf Goldenrod (*Solidago graminifolia*) predominating. **Topography:** Mostly low and rolling, marsh-like in spring and early summer, drying out in August to almost no water. **Elevation:** 517.9 to 530.1 ft **Weather:** Usually foggy until 0700 or 0750 on cool mornings because of cooling sprays from nearby nuclear power plant. Some violent rainstorms lasting several hours, but much sunny and very warm weather as summer advanced. Spring wet well into summer. **Coverage:** between 0600 and 1200. May 4, 11, 18, 24; June 7-8, 14; July 10-11, 20-21, 25; August 9, 31; Total man-hours: 92.5. **Census:** Red-winged Blackbird, 27 (169, 68); Gray Catbird, 5 (31, 13); Am. Robin, 5; Com. Yellowthroat, 5; Song Sparrow, 5; Willow Flycatcher, 4 (25, 10); Yellow Warbler, 4; Com. Grackle, 4; Indigo Bunting, 4; Cardinal, 3 (19, 8); Field Sparrow, 3; Bobwhite, 2; Ring-necked Pheasant, 2, Am. Woodcock, 2; Mourning Dove, 2; Black-capped Chickadee, 2; House Wren, 2; Short-billed Marsh Wren, 2; Brown Thrasher, 2; E. Meadowlark, 2; Rufous-sided Towhee, 2; Blue-winged Teal, 1; Yellow-billed Cuckoo, 1; Screech Owl, 1; Com. Flicker, 1; Downy Woodpecker, 1; Long-billed Marsh Wren, 1; Bell's Vireo, 1. **Total:** 28 species; 96 territories (601/km², 243/100 acres). **Remarks:** 35 nests found: Ring-necked Pheasant, 1; Mourning Dove, 2; Yellow-billed Cuckoo, 1; Gray Catbird, 2; Am. Robin, 6, Bell's Vireo, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 16; Com. Grackle, 2; Field Sparrow, 2; Song Sparrow, 1. Bobwhite were seen with young. Special thanks to Joe Nyhoff, Steve Hossler, Bob and Joan Tweit, and Kay Brennan for their assistance. — JANICE LINKLETTER, 2211 W. Carmen Ave., Chicago, Ill. 60625.

106. FLOODPLAIN TALLGRASS PRAIRIE-SHRUB SUCCESSION. — **Location:** Kansas; Douglas Co., portion of Baker Wetlands Research Area (Baker Univ., Baldwin City). It occupies much of the SW ¼, NW ¼, Section 18, T-13N, R-20E, Lawrence East Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (square, measured). **Description of Plot:** This is an expanse of floodplain tallgrass prairie which has not been mowed or burned for approximately 7-10

years and has progressed into a stage of succession dominated by shrubs, predominantly Rough-leaved Dogwood (*Cornus drummondii*), which are 6-8 ft high. A few trees up to 18 ft high, widely scattered throughout the area, include Honey Locust (*Gleditsia triacanthos*), Osage Orange (*Maclura pomifera*), Am Elm (*Ulmus americanus*) and Red Mulberry (*Morus rubra*). Shrub vegetation was quantitatively measured using the line strip method for density (see Lindsey, *Ecology* 36: 485, 1955) and the line interception method for cover (see Canfield, *J. Forestry* 39: 388, 1941). Rough-leaved Dogwood comprised 90% of all individual shrubs (relative density 97.1%). Its relative frequency was 85% and it provided 18% of the cover. Forbs and grasses were sampled using randomly thrown quadrats (1.0 m² for forbs and 0.1 m² for grasses). Those forbs comprising 90% of the total number include (figures after each species give relative density, relative frequency and % of cover): Tickseed Sunflower (*Bidens polylepis*) 42, 81, 52; Saw-toothed Sunflower (*Helianthus grosseserratus*) 18, 88, 28; Com. Sunflower (*H. annuus*) 33, 66, 15; Prairie-mimosa (*Desmanthus illinoensis*) 3, 43, 5. Those grasses comprising 90% of the total number include the Com. Sedge (*Carex normalis*) 34, 33, 32; Brome (*Bromis emarginata*) 26, 28, 20, Com. Spikerush (*Eleocharis palustris*) 14, 6, 20, Beaked Sedge (*C. rostrata*) 13, 28, 23; Baltic Rush (*Juncus balticus*) 6, 19, 5. Low depressions which hold water throughout much of the summer often contain dense stands of spikerush. Prairie Cordgrass (*Spartina pectinata*) is found in the open, low-lying areas. **Edge:** Bordered by similar vegetation on all sides but the terrain is interrupted by a levee about 200 ft from the W boundary and a gravel road about 200 ft from the S boundary. **Topography:** Essentially flat. **Elevation:** 818 ft. **Weather:** The mean temperature was 79.9°F (range 69-88°). Precipitation was slightly below average. **Coverage:** June 17-19, 23-27. Five trips between 1830 and 2030 and 3 between 0730 and 1030, CDT. Total man-hours: 28. **Census:** Red-winged Blackbird, 23 (230, 93); Dickcissel, 21 (210, 85); Com. Yellowthroat, 18 (180, 73); Bell's Vireo, 8.5 (85, 34); Mourning Dove, 7 (70, 28); E. Meadowlark, 7; Yellow-billed Cuckoo, 6 (60, 24); Brown-headed Cowbird, 6, Am Goldfinch, 5 (50, 20); Willow Flycatcher, 4 (40, 16), Yellow Warbler, 4; Orchard Oriole, 4; Com. Grackle, 3.5 (35, 14); Black-billed Cuckoo, 3 (30, 12); Brown Thrasher, 3; Gray Catbird, 2; Bobwhite, 1.5; Indigo Bunting, 1; Am. Robin, 0.5. **Total:** 19 species, 128 territorial males (1280/km², 518/100 acres). **Remarks:** Nests found: Red-winged Blackbird 13, Dickcissel 5, Bell's Vireo 4, Mourning Dove 3, Com. Yellowthroat 3, Yellow-billed Cuckoo 2, Am. Goldfinch 2, Black-billed Cuckoo 1, Willow Flycatcher 1, Yellow Warbler 1, Com. Grackle 1, Orchard Oriole 1. It is interesting to note the increase in species with succession from tallgrass prairie to shrub. Only four species breed in Census Plot 103 just S of this plot where yearly mowing prevents the invasion of woody species of plants. After 7-10 years of succession, there are 19 species of birds, an increase of 375%. Not only does the number of species increase, but also the number of territorial males for a given species. The number of E. Meadowlarks has changed from 4 to 7 territorial males, Dickcissels from 14 to 21 males, Com. Yellowthroats from 5 to



Census 106. Tallgrass Prairie - Shrub Succession census plot.

18 males, and Red-winged Blackbirds from 7 to 23 males. It is interesting that the two most dominant species (numerically) in the prairie maintained by mowing, the Red-winged Blackbird and Dickcissel, are also dominant in the shrub succession. Increases in the number of breeding bird species and number of territorial males probably not only the new potential nest sites provided by shrubby vegetation but also increased diversity of prey items. Our thanks to Ivan Boyd for allowing us to use this area and to Tim Broschat and Peter Lowther for their help in setting up the grid. — CALVIN L. CINK and JOHN T. PAUL, *Museum of Natural History, Univ. of Kansas, Lawrence, Kan. 66045*.

107. MIXED HABITAT-DISTURBED BOTTOM-LAND. — **Location:** Oklahoma; Washington Co.; Dewey, 2 miles W of intersection of Ninth Street and Highway 75 and 0.3 mile N on E bank of Caney River; 36°48'N, 95°58'W, Tulsa Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 40.47 ha = 100 acres (irregular rectangle roughly 600 by 800 yards) determined from SCS aerial map. **Description of Plot:** See AB 26: 976-977, 1972. **Weather:** Mild with rain storms through mid-June; temperatures ranged from 35 to 84°F. **Coverage:** April 5, 12, 18, 26; May 3, 12, 19, 29; June 5, 13, 26; July 1; one trip between 1230 and 1600; all others between 0700 and 1205, CDT. Total man-hours: 41. **Census:** Indigo Bunting, 19 (47, 19); Blue-gray Gnatcatcher, 12 (30, 12); Red-winged Blackbird, 12; Com. Yellowthroat, 10 (25, 10); Cardinal, 10; Am. Goldfinch, 5 (12, 5); Ruby-throated Hummingbird, 4.5 (11, 5); Tufted Titmouse, 4 5; Yellow-billed Cuckoo, 4 (10, 4); Brown-headed Cowbird, 4; Painted Bunting, 3.5 (9, 4); Red-bellied Woodpecker, 3 (7, 3); Dickcissel, 3; Downy Woodpecker, 2.5; Carolina Chickadee, 2.5; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Red-eyed Vireo, 2; Yellow-breasted Chat, 2; E. Meadowlark, 2; Green Heron, 1.5; Blue Jay, 1.5; Carolina Wren, 1.5; E. Bluebird, 1.5; N. Parula, 1.5; Killdeer, 1; Com. Flicker, 1; Red-headed Woodpecker, 1; E. Phoebe, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Bell's

Vireo, 1; Kentucky Warbler, 1; Orchard Oriole, 1; Com. Grackle, 1; Summer Tanager, 1; Blue Grosbeak, 1; Field Sparrow, 1; Great Blue Heron, 0.5; Bobwhite 0.5; Barred Owl, 0.5; Belted Kingfisher, 0.5; Pileated Woodpecker, 0.5; Acadian Flycatcher, 0.5; Prothonotary Warbler, 0.5; Red-shouldered Hawk, +; Hairy Woodpecker, +; Lark Sparrow, +. **Total:** 48 species, 133.5 territorial males (330/km², 134/100 acres). **Remarks:** Except for the wheat crop in the cultivated area on the S, the plot was not disturbed this year. With the wet weather, vegetation became very dense. The marsh has not dried up since 1973 and cattails are so thick it is almost impossible to see the water. There was very little change in the bird population between 1974 and 1975. — ELLA DELAP, 409 N. Wyandotte, Dewey Okla. 74029.

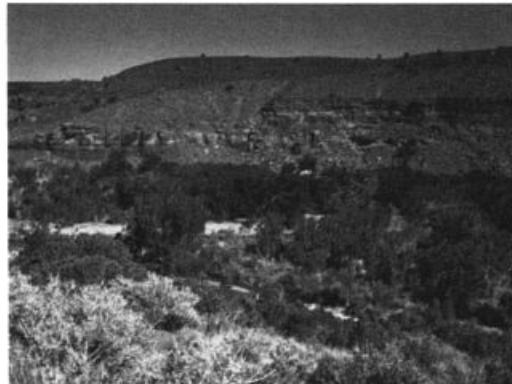
108. CALIFORNIA-BAY-BUCKEYE-MIXED FOREST. — **Location:** California; Marin Co., 3.5 miles NW of Bolinas, just inside the southern boundary of Point Reyes National Seashore: 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 4 ha = 10 acres (irregular, measured). **Description of Plot:** See AB 26 979, 1972. **Weather:** See Census 117. **Coverage:** May 7, 16, 20, 30; June 10. Total man-hours: 12. Trips made between 0630 and 1030 hours. **Census:** Wilson's Warbler, 6 (148, 60); Com. Bushtit, 4 (99, 40); Wrentit, 4; Bewick's Wren, 4; Western Flycatcher, 3.5 (86, 35); Chestnut-sided Chickadee, 3 (74, 30); Winter Wren, 3; Am. Robin, 3; Swainson's Thrush, 3; Warbling Vireo, 3; Black-headed Grosbeak, 3; Olive-sided Flycatcher, 2; Am. Goldfinch, 2; Brown Towhee, 1.5; Violet-green Swallow, 1; Steller's Jay, 1; Hutton's Vireo, 1; Purple Finch, 1; Rufous-sided Towhee, 1; Scrub Jay, 0.5. **Total:** 22 species; 60 territorial males (1483/km², 600/100 acres). **Remarks:** Nests found Chestnut-backed Chickadee, 2. One male Warbling Vireo banded as an adult in 1966 was 10 years old Contribution No. 113, PRBO. — ROBERT M STEWART, *Point Reyes Bird Observatory, Bolinas Calif. 94924*.

109. WAX MYRTLE FOREST. — **Location:** California; Los Angeles Co., 2 miles N of San Bernardo freeway and 210 freeway; 34°07'N, 117°48'W, San Dimas Quadrangle, USGS. **Continuity:** New. **Size:** 12.14 ha = 30 acres (rectangular, paced). **Description of Plot:** The dominant canopy tree is California Wax Myrtle (*Myrica californica*). The prominent understory has mainly willow (*Salix* sp.) and Tree Tobacco (*Nicotiana glauca*). A quantitative survey of the vegetation gave the following results: Trees > 3-inches diameter, based on five circular samples, 425/acre: total basal area 363 ft²/acre. Species comprising 90% of the total number of trees: California Wax Myrtle, 425, 90, 58, 100. Trees by diameter size class: A (3-6 in.) 405, 80, 40.5, 135: B (6-9 in.) 20, 20, 4.8, 16. Shrub stems/acre 15,480; ground cover 85%; canopy cover 60%; average canopy height 19 ft (range 9-24). A 5-ft wide drainage ditch runs through the plot. **Edge:** Bordered on all sides by similar forest and open fields. **Topography:** Flat. **Elevation:** 971 ft. **Weather:** Hot and cloudy. **Coverage:** March 2; May 26; June 2, 7, 12, 15, 19, 28; from

0600 to 1500. Total man-hours: 22. **Census:** Song Sparrow, 37 (305, 123); Am. Goldfinch, 14 (115, 47); W. Meadowlark, 9 (74, 30); Rufous-sided Towhee, 5 (41, 17); Anna's Hummingbird, 4 (33, 13); Rufous-crowned Sparrow, 4; Com. Bushtit, 3 (25, 10); Gray Catbird, 2; Yellow-rumped Warbler, 2; California Thrasher, +. **Total:** 10 species; 80 territorial males ($659/\text{km}^2$, 267/100 acres). **Remarks:** Five nests were located: Anna's Hummingbird, 2; Am. Goldfinch, 1; Rufous-sided Towhee, 2. — DANIEL R. MCCARTY, 14044 Barrydale, La Puente, Calif. 91746.

110. MAPLE THICKET. — **Location:** Utah; Cache Co., W border begin 0.5 mile E of Green Canyon Cave on the S side of Green Canyon Road, $41^\circ 46' 25''\text{N}$, $111^\circ 45' \text{W}$, Smithfield Quadrangle, USGS. **Continuity:** New. **Size:** 4.86 ha = 12 acres (rectangular, steel tape). **Description of Plot:** Eighty per cent of the plot is scrub Bigtooth Maple (*Acer griseum*) with an average of 6-7 cm dbh with sparse ground cover of mixed grasses (*Agropyron cristatum*, *Poa bulbosa*) and forbs (*Wyethia amplexicaulis*, *Achillea millefolium*, *Berberis repens*, *Gutierrezia sarothrae*). Fifteen per cent is more open canopy comprised of a mixture of scrubby trees of Mountain Mahogany (*Cercocarpus montanus*), Utah Juniper (*Juniperus osteosperma*), Choke Cherry (*Prunus virginiana*), and Bigtooth Maple and grasses and sagebrush (*Artemesia tridentata*). Five per cent contains a dense canopy of 40 ft Maple with a range of dbh from 2 to 21 cm (average 10 cm dbh). (Dense is here defined as over 75 trees/20 m diameter circle.) **Edge:** Bounded by road on N and steep rocky area on S. **Topography:** 5-20% slope, elevation 5200-5400 ft. **Coverage:** May 31; June 11, 21, 27; July 4, 10, 18, 25; August 2; from about 0630-0830 with one evening census. Total: 17 party-hours or 38.5 man-hours. **Census:** Warbling Vireo, 12 (247, 100); Lazuli Bunting, 6 (124, 50); Black-headed Grosbeak, 2; Ruffed Grouse, 2; Chipping Sparrow, 2; Rufous-sided Towhee, 2. **Total:** 6 species; 26 territorial males ($535/\text{km}^2$, 217/100 acres). **Remarks:** One Black-headed Grosbeak and one Warbling Vireo nest were found. Four 8-10 day old Ruffed Grouse were seen. Conducted as a Bridgerland Audubon project by Allen Stokes, Scott Paton, Astrid Brown, Rick and Judy Nunes, Dave Schimpf, Dennis and Elaine Davis, Roger Olsen, Nancy West, Kathy and Doug Stannard, Bob and Kathy Bayn, Peter Cley, and Steve Hoffman. — ANN SCHIMPF, 715 North 3rd East, Logan, Utah. 84321.

111. RIPARIAN WOODLAND-WILLOW THICKETS. — **Location:** Utah; Washington Co. at mouth of Zion Canyon and adjoining S boundary of Springdale; $37^\circ 09' 55''\text{N}$, $113^\circ 00' 45''\text{W}$ (NW $\frac{1}{4}$ of SW $\frac{1}{4}$, Sec. 5, T42S, R10W, Salt Lake B&M); Zion National Park (Zion Canyon Section), Utah, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (440 yards square, paced). **Topography:** Mostly flat floodplain, but with a bare-rock hogback extending 200 ft into the NE corner and a rocky ridge covering 5.5 acres in the SE corner. A dirt road, seldom used, runs eastward from the NW corner through the N third of the plot. **Elevation:** 1148 to 1189 m (3765 to 3900 ft). **Description of Plot:** The main part consists of willow-tamarisk thickets surrounding the confluence of the North and



Census 111. Blackbrush in foreground. Willow thickets and cottonwoods lining N and E forks of Virginia River Photo/P. Scott.

East Forks of the Virgin River. Cottonwoods, Black Willows and ash trees are scattered among the thickets and form a mature woodland belt on the W side of the North Fork. At the N center a fenced pasture has 1.5 acres within the plot; a 1.7-acre abandoned field in the NW corner is reverting to willow thickets. Trees 3 inches or more in diameter, based on 6 circular samples, 113/acre; total basal area, $61.3 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Fremont Cottonwood (*Populus fremontii*), 46, 41, 66, 100, Black Willow (*Salix lasiandra*), 24, 21, 16, 67; Velvet Ash (*Fraxinus velutina*), 29, 26, 12, 50; Box Elder (*Acer negundo*), 14, 12, 5, 33. Trees by diameter size class: A (3-6 in.) 34, 30, 3.4, 3; B (6-9 in.) 24, 20, 7.2, 8; C (9-15 in.) 40, 35, 32, 32; D (15-21 in.) 10, 9, 17.3, 18; E (21-27 in.) 3, 3, 9.9, 10; F (27-33 in.) 0; G (33-40 in.) 2, 2, 11.4, 11; H (40+ in.) 2, 2, 17, 17. Canopy cover, 33%; average canopy height, 47 ft (range 22-95). The thickets average 17 ft in height (range 8-24), with 14,660 shrub stems/acre; ground cover is negligible. The dominant shrubs in the thickets are Sandbar Willow (*S. exigua*) 63%, Tamarisk (*Tamarix pentandra*) 17%, sapling Cottonwoods 12% and sapling Black Willows 5%. Emory Baccharis (*Baccharis emoryi*) and Rubber Rabbitbrush (*Chrysothamnus nauseosus*) are common along the edges of the thickets and in small clearings; neither was present in the sample circles. A separate survey of the desert shrubs on the rocky ridge at the SE corner, based on 6 circular samples, showed 920 shrub stems/acre; ground cover 44%. Shrubs comprising 90% of the total Blackbrush (*Coleogyne ramosissima*) 49%, Matchbrush (*Gutierrezia sarothrae*) 30%, Pale Wolfberry (*Lycium pallidum*) 9% and Fourwing Saltbush (*Atriplex canescens*) 6%. Soil: Sand, with sandy loam in the NW corner and gravel on the ridge at the SE corner. **Edge:** The SE corner is bordered by similar desert shrubs, and the riparian woodland continues along the streams beyond the NE and SW corners. A mixed orchard, 5 to 100 yards wide, adjoins the W side; it is bordered by Utah Highway 15, and a cliff and talus slope about 200 ft high parallel the W side of the highway. **Weather**

Unusually cold and snowy in April and early May, delaying the leafing out of Cottonwoods by about 3 weeks; very dry in June. Temperatures ranged from 26° on May 6 to 103°F on July 2. **Coverage:** April 18, 21, 25, 28; May 4, 9, 11, 24-26, 29; June 1, 2, 9, 13, 21; July 4; between 0630 and 1300 or 1700 and 2100, MDT. Total man-hours: 52. **Census:** House Finch, 10 (62, 25); W. Wood Pewee, 7 (43, 18); N. Oriole, 6 (37, 15); Lesser Goldfinch, 6; Black-headed Grosbeak, 5 (31, 13); Bewick's Wren, 4 (25, 10); Am. Robin, 4; Yellow Warbler, 4; Yellow-breasted Chat, 4; Brown-headed Cowbird, 4; Starling, 3.5 (22, 9); Mourning Dove, 3 (19, 8); Black-chinned Hummingbird, 3; Black-throated Sparrow, 3; Blue-gray Gnatcatcher, 2; Song Sparrow, 2; Spotted Sandpiper, 1; Com. Flicker, 1; Hairy Woodpecker, 1; W. Kingbird, 1; Ash-throated Flycatcher, 1; Black Phoebe, 1; Rock Wren, 1; Lucy's Warbler, 1; Red-tailed Hawk, 0.5; Belted Kingfisher, 0.5. **Total:** 26 species; 79.5 territorial males or female cowbirds or hummingbirds ($491/\text{km}^2$, 199/100 acres).

Remarks: Territories of most species were concentrated in the mature riparian woodland N and W of the North Fork. The gregarious habits of House Finches made delineation of territories difficult, and there appeared to be a surplus of males. Rough-winged and Cliff Swallows nested in riverbanks and on cliffs nearby and fed over the plot. At the end of August Lesser Goldfinches had resumed nesting and territorial activity. Nests found: Am. Robin, 3; Starling, 3; N. Oriole, 3; Lesser Goldfinch, 2; Black-chinned Hummingbird, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Black-headed Grosbeak, 1; House Finch, 1. The plot was surveyed and the vegetation analyzed by Jerome Gifford. We thank Ardell DeMille, Vernon Dickman and Howard Smith for permission to conduct the census on their lands. — KEN KERTELL and PETER SCOTT, Springdale, Utah 84767.

112. FLOODPLAIN COTTONWOOD FOREST.

— **Location:** Colorado; Weld Co., on the W bank of the South Platte River about 6 miles S and 1.5 miles E of Johnstown. Parts of Sects. 34 & 35. T4N, R67W, 40°21'N, 104°14'W, Milliken Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size** 52.2 ha = 128.9 acres (measured from an aerial photo with a planimeter). **Description of Plot:** See AB 27 997, 1973. **Weather:** Mostly clear, dry and warm.

Coverage: May 4, 11, 18, 25; June 1, 8, 14, 22, 29; July 7, 13; between 0610 and 0910. Total man-hours: 22.5. **Census:** House Wren, 38 (73, 29); Starling, 20 (38, 16); Com. Yellowthroat, 9 (17, 7); Mourning Dove, 7 (13, 5); Com. Flicker, 6 (12, 5); Am. Robin, 4 (8, 3); E. Kingbird, 3 (6, 2); Black-capped Chickadee, 3; Red-headed Woodpecker, 2; W. Meadowlark, 2; Mallard, 1; Am. Kestrel, 1; Great Horned Owl, 1; Red-winged Blackbird, 1. **Total:** 14 species; 98 territorial males ($188/\text{km}^2$, 76/100 acres). **Remarks:** Total species increased from 13 in 1974 to 14 with an increase in territorial males from 78 in 1974 to 98. Numbers of territorial birds increased for 8 species, decreased for 1, and were unchanged for 3. Species with the largest increases were Starlings from 12 in 1974 to 20 and Mourning Doves from 4 to 7. Red-winged Blackbirds decreased from 4 in 1974 to 1. Black-

capped Chickadees were territorial in 1973, absent in 1974, and returned in 1975. One 1974 species, Downy Woodpecker, was not territorial in 1975. — BRUCE R JOHNSON, Dept. of Fishery and Wildlife Biology, Colorado State Univ., Fort Collins, Colo. 80523

113. FLOODPLAIN COTTONWOOD FOREST.

— **Location:** Colorado; Jefferson Co., about 10 miles SW of Denver; NE/4, Sec. 14, T6S, R69W, 6th PM, 39°32'N, 105°5'W, Littleton Quadrangle, USGS. **Continuity:** Established 1971; 5 consecutive years. **Size** 9.7 ha = 24 acres. **Description of Plot:** See AB 25 966-967, 1971. **Weather:** Normal. **Coverage:** March 2, 8; April 13, 19-20; May 3; June 1, 6, 8, 14, 18, 21, 29, July 11, 23, 30; from 0700 to 2000 hours. Total man-hours: 29. **Census:** House Wren, 35 (360, 146); Great Blue Heron, 24 (247, 100); Com. Yellowthroat, 12 (124, 50); Yellow Warbler, 10 (103, 42); N. Oriole, 9 (93, 37); Am. Robin 8 (82, 33); Mourning Dove, 7 (42, 29); Starling, 5 (51, 21); Warbling Vireo, 5, E Kingbird, 4 (41, 17); *Passerina* buntings 4; [Lazuli, 2, Indigo, 1.5; hybrid, 0.5]; Am. Goldfinch, 4; Downy Woodpecker, 3; Rufous-sided Towhee, 2; Am. Kestrel, 1; Great Horned Owl, 1; Com. Flicker, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Yellow-breasted Chat, 1; Rough-winged Swallow, 0.5; Blue Grosbeak, 0.5. **Total:** 23 species plus one hybrid, 139 territorial males ($1431/\text{km}^2$, 579/100 acres). Excluding the colonial nesting herons, 115 territorial males, $1184/\text{km}^2$, 479/100 acres. **Remarks:** Sixty to 75% of the trees have died, owing to the deprivation of water described last year. Grasses grew hip-deep. Then, about June 15, Chatfield Reservoir began filling, and within about a week the water level reached to within a foot of the forest floor. The obvious effect came with damp, soggy ground at the N end of the grove, close to the rising waters. The Com. Yellowthroat population tripled over previous years; they established at least 7 of the territories after the flooding began downstream, and where many cattail marshes went underwater. We attribute the increase to displaced birds which renested. The only other noticeable displacement came with several pairs of Mallards, which used the grove for resting for about 2 weeks. The denuded and dead trees apparently contributed to the decline of Yellow Warblers (down 50%), robins (down one-third), and Red-eyed Vireos (absent). House Wrens increased, by 6 over the average, by one over last year. They occupy tiny territories, with nest sites very close to each other. We found 55 nests, including 24 Great Blue Herons (which had 67 young on June 29), 15 House Wrens, 4 Starlings, 3 orioles, 2 E. Kingbirds, and one each of owl, flicker, Downy Woodpecker, Rough-winged Swallow, robin, Yellow Warbler, and Am. Goldfinch. — NANCY HURLEY, URLING KINGERY, DOUGLAS STOTZ, JO TRAINOR, and HUGH KINGERY (compiler), 869 Milwaukee St., Denver, Colo. 80206

114. CALIFORNIA-BAY-BISHOP PINE-MIXED FOREST.

— **Location:** California; Marin Co., 0.5 miles S of Inverness; 38°03'N, 122°50'W, Inverness Quadrangle, USGS. **Continuity:** Established 1972, 4 consecutive years. **Size:** 11.7 ha = 29 acres (approximately rectangular, 900 x 2500 ft, measured). **Description:**

tion of Plot: See *AB* 26: 981, 1972. **Weather:** High fog on 2 mornings, otherwise sunny and clear. See Census 117 **Coverage:** April 10, 16, 29; May 8, 14, 29; between 0700 and 1230 hours. Total man-hours: 21. **Census:** Wilson's Warbler, 8.5 (72, 29); Pine Siskin, 8 (68, 28); Purple Finch, 7 (60, 24); Rufous-sided Towhee, 5.5 (47, 19); Chestnut-backed Chickadee, 5 (43, 17); Western Flycatcher, 4 (34, 14); Com. Bushtit, 4; Brown Creeper, 4; Hermit Thrush, 3 (26, 10); Hutton's Vireo, 3; Orange-crowned Warbler, 3; Dark-eyed Junco, 2.5; Hairy Woodpecker, 2; Steller's Jay, 2; Wrentit, 2; Bewick's Wren, 2; Swainson's Thrush, 2; Mourning Dove, 1; Anna's Hummingbird, 1; Warbling Vireo, 1; Am. Goldfinch, 1; Acorn Woodpecker, 0.5; Pygmy Nuthatch, 0.5; Song Sparrow, 0.5; Band-tailed Pigeon, +; Pileated Woodpecker, +; Golden-crowned Kinglet, +. **Total:** 27 species; 73 territorial males ($622/\text{km}^2$, 252/100 acres). **Remarks:** Nests found, 9: bushtit, 3; Brown Creeper, 2; Allen's Hummingbird, 1; Orange-crowned Warbler, 1; Wilson's Warbler, 1; Chestnut-backed Chickadee, 1. During the last four years the bird population has dropped in each successive year from 114 territorial males in 1972 to 73 this year. Contribution No. 116, PRBO. — ROBERT M STEWART, *Point Reyes Bird Observatory, Bolinas, Calif.* 94924.

115. LODGEPOLE PINE FOREST WITH ASPEN. — **Location:** Colorado, Summit Co., 1 mile W of Silverthorne and immediately N of Mesa Cortina West subdivision in Arapaho National Forest, $39^{\circ}37'30''\text{N}$, $106^{\circ}5'\text{W}$ (correction on longitude), Frisco and Dillon Quadrangles, USGS. **Continuity:** Established 1970; 4 intermittent years. **Size:** 13.35 ha = 33 acres (oblong; measured by steel tape and compass). **Description of Plot:** See *AFN* 24: 551 and 760, 1970, but hereby redescribed in accordance with James and Shugart: A Lodgepole Pine forest with aspen, particularly in two separate edge sections totaling about 4 acres, but also scattered among the pines. A second-growth forest, this stand contains a handful of fire-burned stumps. Woody undergrowth consists mainly of Myrtle Whortleberry (*Vaccinium myrtillus*) and Kinikinnik (*Arctostaphylos uva-ursi*); the principal shrub is Com. Juniper (*Juniperus communis*), which is scattered throughout the forest; it grows to a height of 2-3 ft with the diameter of the branches from 2 to 10 ft. Flowering plants, in order of abundance, include Lupine (*Lupinus argenteus*), Heart-leaved Arnica (*Arnica cordifolia*), Paintbrush (*Castilleja sulphurea*), two species of milk vetch (*Astragalus* spp.), Oregon Grape (*Mahonia repens*), *Pyrola* *virens*, Pipsissewa (*Chimaphila umbellata*), and Calypso Orchid (*Calypso bulbosa*), and a few other flowering plants. The non-porous clay soil causes several vernal ponds to form; these lack vegetation except grass. Two permanent ponds have grass and a few willows (*Salix* sp.). Mixed in with the flowering plants, especially in the aspen groves, are some grasses. A quantitative survey of the vegetation gave the following results: Trees, 3-inches diameter and over, based on nine 0.1-acre circular samples, 628/acre; total basal area, 220.3 square feet/acre. Species comprising the study plot [figures after each give number of trees/acre, relative density (%), relative

dominance, frequency, in that sequence]: Lodgepole Pine (*Pinus contorta* var. *latifolia*) 455, 72, 88, 100, Quaking Aspen (*Populus tremuloides*) 81, 13, 7, 66, dead aspen, 58, 9, 3, 66; dead Lodgepole Pine 25, 4, 1, 88; Alpine Fir (*Abies lasiocarpa*) 7, 1, +, 44; Engelmann Spruce (*Picea engelmannii*) 2, +, +, 11. Total trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in ft^2/acre , relative dominance): A (3-6 in.) 294, 47, 29.4, 13; B (6-9 in.) 175, 28, 52.5, 23; C (9-15 in.) 150, 24, 120.0, 55; D (15-21 in.) 8, 1, 15.0, 7, E (21-27 in.) 1, +, 3.4, 2. Tree species by diameter size class—Lodgepole Pine: A 158, 25, 15.8, 7; B 141, 22, 42.3, 19; C 147, 23, 117.6, 53; D 8, 1, 15.0, 7; E 1, +, 3.4, 2. Aspen: A 50, 8, 5.0, 2; B 29, 5, 8.7, 4, C 3, +, 2.4, 1. Dead aspen: A 54, 9, 5.4, 3; B 3, +, 1.0, +. Dead lodgepole: A 24, 4, 2.4, 1; B 1, +, 0.3, +. Shrub stems/acre 15,000; ground cover, 25%; canopy cover, 71%; average canopy height, 63 (range 45-78) **Edge:** about 65% of the border is lodgepoles, and about 35% is aspen. **Elevation:** 9200 ft. **Topography:** Sloping with an elevation differential of about 50 ft **Weather:** A late, snowy spring with a heavy snowstorm June 8-10; normal after that. **Coverage:** June 15, July 4-5, 13, 19, 27; mostly from 0700 to 1100. Total man-hours: 14. **Census:** Gray-headed Junco, 5 (37, 15), Mountain Chickadee, 4 (30, 12); Yellow-rumped Warbler, 3 (22, 9); Ruby-crowned Kinglet, 2; Black-capped Chickadee, 1; Gray Jay, 1; Brown Creeper, 1; Hermit Thrush, 1; Warbling Vireo, 1; Com. Flicker, +; Western Flycatcher, +. **Total:** 11 species; 19 territorial males ($142/\text{km}^2$, 58/100 acres). — HUGH KINGERY, 869 Milwaukee St., Denver, Colo. 80206.

116. PONDEROSA PINE-SCRUB-OAK-MAHOGANY WOODLAND. — **Location:** Colorado, Douglas Co., 1 mile E of Franktown, on Highway No 86; $39^{\circ}20'\text{N}$, $104^{\circ}40'\text{W}$, Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 8 consecutive years. **Size:** 8.09 ha = 20 acres (surveyed; a trapezium, 453.70 ft on the N, 607.36 ft on the S along Highway No. 86, 1906.40 ft on the E, 1649.90 ft on the W) **Weather:** Cool and dry, we had a 2 in. snow June 8, and it stayed cool until the first of July when it shot up to over 90°F for 10 days in a row. **Coverage:** May 25, June 4, 11, 19, 27; July 5, 12, 18, 25; August 1, 8, 15, 22; from 0800 and 2030 hours. Total man-hours 49 **Census:** W. Bluebird, 24 (27, 120); W. Wood Pewee, 4 (49, 20); House Wren, 2; Mountain Bluebird, 2; Broad-tailed Hummingbird, 1; White-breasted Nuthatch, 1; Solitary Vireo, 1; House Finch, 1; Lesser Goldfinch, 1; Chipping Sparrow, 1. **Total:** 10 species, 37 territorial males ($457/\text{km}^2$, 185/100 acres). **Remarks:** There were 24 nests in boxes, 13 other nests were found. Predation seemed high. Because of the late snow, all nesting was 2 weeks late. There were 83 W Bluebird eggs but only 20 young fledged — MILDRED O. SNYDER, 161 Del Mar Circle, Aurora, Colo. 80011.

117. BISHOP PINE FOREST. — **Location:** California; Marin Co., 3.75 miles WNW of Inverness, $38^{\circ}37'\text{N}$, $122^{\circ}53'\text{W}$, Drakes Bay Quadrangle, USGS. **Continuity:** Established 1952 (1951); 7 intermittent

years **Size.** 10.5 ha = 26 acres (irregular, measured). **Description of Plot:** See AB 26: 986, 1972. **Weather:** A harsh early spring delayed breeding of resident species. The highest rainfall in 9 years occurred in March and April and mean low temperatures were 4° lower than normal in these months. **Coverage:** March 27, April 9, 17, 25, 30; May 15, 28; between 0700 and 1200 hours. Total man-hours: 22. **Census:** Pine Siskin, 16 (152, 62); Wrentit, 13 (124, 50); Wilson's Warbler, 7 (67, 27); Bewick's Wren, 6.5 (62, 25); Western Flycatcher, 6; (57, 23); Hutton's Vireo, 6; Dark-eyed Junco, 6; Purple Finch, 5.5 (52, 21); Song Sparrow, 5.5, Rufous-sided Towhee, 4.5 (43, 17); Chestnut-backed Chickadee, 4 (38, 15); Brown Creeper, 4; Pygmy Nuthatch, 3.5 (33, 13); Violet-green Swallow, 3 (29, 12); Winter Wren, 2.5; Hairy Woodpecker, 2; Steller's Jay, 2; Swainson's Thrush, 2; Am. Goldfinch, 2, California Quail, 1.5; Orange-crowned Warbler, 1.5; Anna's Hummingbird, 1; Allen's Hummingbird, 1; Olive-sided Flycatcher, 1; Com. Bushtit, 1; White-crowned Sparrow, 1; Com. Flicker, +; W. Wood Pewee, +; Am. Robin, +. **Total:** 30 species; 110.5 territorial males ($1050/\text{km}^2$, 425/100 acres). **Remarks:** Nests found 16: Violet-green Swallow, 3; Pygmy Nuthatch, 3; Chestnut-backed Chickadee, 3; Dark-eyed Junco, 2; Wilson's Warbler, 2; Brown Creeper, 1; Hairy Woodpecker, 1; Allen's Hummingbird, 1. There were at least 6 female Allen's Hummingbirds and 1 female Anna's Hummingbird breeding on the plot. Contribution No. 117, PRBO. — PAMELA KRUSKAL, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

118. BISHOP PINE FOREST. — **Location:** California; Marin Co., on Point Reyes National Seashore, 1.5 miles W of Inverness, 0.75 mile NW of Mt Vision; $38^\circ06'N$, $122^\circ52'W$, Drakes Bay Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 8.5 ha = 21 acres (irregular, approximately 700 x 1100 ft, measured). **Description of Plot** See AB 26: 985-986, 1972. **Weather:** See Census 117 **Coverage:** May 6, 13, 19, 23, 26; June 1; between 0700 and 1215 hours. Total man-hours: 17. **Census:** Wrentit, 11 (129, 52); Pine Siskin, 8 (94, 38); Wilson's Warbler, 7 (82, 33); Western Flycatcher, 4 (47, 19); Hutton's Vireo, 4; Rufous-sided Towhee, 4; Mourning Dove, 3 (35, 14); Chestnut-backed Chickadee, 3; Com. Bushtit, 3; Bewick's Wren, 3; Dark-eyed Junco, 3; Winter Wren, 2.5; Steller's Jay, 2; Swainson's Thrush, 2; Purple Finch, 2; Am. Goldfinch, 2; Allen's Hummingbird, 1; Hairy Woodpecker, 1; Brown Creeper, 1; Song Sparrow, 1. **Total:** 20 species; 67.5 territorial males ($794/\text{km}^2$, 321/100 acres). **Remarks:** Nests found 5: Brown Creeper, Mourning Dove, Wilson's Warbler, Allen's Hummingbird, Song Sparrow, 1 each. There were at least three Allen's Hummingbird females breeding within the plot. Contribution No. 115, PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

119. DISTURBED BISHOP PINE FOREST. — **Location:** California; Marin Co., Inverness Ridge, Point Reyes National Seashore, 3 miles NW of Inverness Park; $38^\circ04'N$, $122^\circ51'W$, Inverness Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive

years. **Size.** about 12 ha = 29.7 acres (irregular shape, 850 x 150 m). **Description of Plot:** See AB 26 984-985, 1972. **Weather:** 100% clear and 0 wind on each census day. See Census 117. **Coverage:** May 5, 12, 21, 24; June 9; between 0700 and 1200 hours. Total man-hours: 15. **Census:** Wrentit, 21 (175, 71); Allen's Hummingbird, 12 (100, 40); Wilson's Warbler, 11 (92, 37); Bewick's Wren, 9 (75, 30); Pine Siskin, 8 (67, 27); Purple Finch, 7.5 (62, 25); Rufous-sided Towhee, 6.5 (54, 22); Swainson's Thrush, 5 (42, 17); Com. Bushtit, 4.5 (37, 15); Brown Creeper, 4.5; Western Flycatcher, 4 (33, 13); Pygmy Nuthatch, 4; Orange-crowned Warbler, 4; Chestnut-backed Chickadee, 3; Hutton's Vireo, 3; Violet-green Swallow, 2; Song Sparrow, 2; Anna's Hummingbird, 1; Com. Flicker, 1; Hairy Woodpecker, 1; W. Wood Pewee, 1; Tree Swallow, 1; Dark-eyed Junco, 1; Steller's Jay, 0.5; Mourning Dove, +; Acorn Woodpecker, +; Olive-sided Flycatcher, +; Purple Martin, +. **Total:** 28 species, 127.5 breeding males ($1061/\text{km}^2$, 429/100 acres) **Remarks:** Nests found, 4: Chestnut-backed Chickadee, Bushtit, Brown Creeper, Hutton's Vireo. Contribution No. 114, PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, P.O. Box 321, Bolinas, Calif 94924.

120. LOGGED DOUGLAS-FIR-RESEEDED WITH MONTEREY PINE. — **Location:** California, Marin Co., 4.5 miles S of Olema, approximately 0.5 mile E of east gate to Lake Ranch, Point Reyes National Seashore; $37^\circ58'N$, $122^\circ45'W$, Double Point Quadrangle, USGS. **Continuity:** Established 1972, 4 consecutive years. **Size:** 8.17 ha = 20.2 acres (irregular, approximately 1200 x 700 ft measured). **Description of Plot:** See AB 26: 983-984, 1972. **Weather:** Generally clear and warm ($70\text{-}80^\circ\text{F}$) on census days Unseasonable heavy rains on April 4-5. Two days of exceedingly strong (Beaufort 5) NW winds during the week of May 18. Low night-time temperatures throughout the last week of May. **Coverage:** March 23, April 1, 12, 22; May 2, 6, 16, 24, 28; June 2, 18, 30, from 0600-1800, but concentrated from 0700-1000. Total man-hours: 44. **Census:** Wrentit, 12 (147, 59); Allen's Hummingbird, 11 (135, 54); Orange-crowned Warbler, 8.5 (104, 42); Rufous-sided Towhee, 8.5; Wilson's Warbler, 7.5 (92, 37); Swainson's Thrush, 5 (61, 25); Purple Finch, 4 (49, 20); California Quail 3 (37, 15), Steller's Jay, 3; Chestnut-backed Chickadee, 3; Bewick's Wren, 3; Pygmy Nuthatch, 2.5; Hutton's Vireo, 2.5; Violet-green Swallow, 2; Com. Bushtit, 2; Pine Siskin, 2; Song Sparrow, 2; Mourning Dove, 1; Com. Flicker, 1; Hairy Woodpecker, 1; W. Bluebird, 1; Starling, 1; Dark-eyed Junco, 1; Black-headed Grosbeak, 0.5; Turkey Vulture, +; Great Horned Owl, +; Red-tailed Hawk, +; Band-tailed Pigeon, +; Acorn Woodpecker, +; Pileated Woodpecker, +; Olive-sided Flycatcher, +; Ash-throated Flycatcher, +; Purple Martin, +; Scrub Jay, +; Brown Towhee, +. **Total:** 35 species; 88 territorial males ($1076/\text{km}^2$, 436/100 acres) **Remarks:** Nests found, 10: Hairy Woodpecker, Violet-green Swallow, 2; Steller's Jay, Chestnut-backed Chickadee, Wrentit, Pygmy Nuthatch, 2; W. Bluebird, Starling. This year's totals reflect a general increase in ground-nesting species (Wrentit, Rufous-

sided Towhee, Orange-crowned Warbler) suggesting an increase in understory. The inclusion, this year, of all territorial male Allen's Hummingbirds should be considered in any comparative analysis with totals of previous years. If they had been listed as fractional breeders (as in previous years) the number of territorial males over the four year period would be 79, 81, 81, 77. All territories contained healthy stands of W. Huckleberry (*Vaccinium ovatum*) which provided the most conspicuous forage. A pair of Pileated Woodpeckers, listed as fractional breeders in conformity with previous years, was seen only once. Thanks to Bob Stewart for consultation. Contribution No. 121, PRBO. — JULES EVENS, Point Reyes Bird Observatory, Bolinas, Calif. 94924

121. MATURE DOUGLAS-FIR FOREST. — **Location:** California; Marin Co., 4 miles NW of Bolinas; 1.75 miles N of Point Reyes Bird Observatory in Point Reyes National Seashore; 37°56'N, 122°43'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 5 consecutive years. **Size:** 6.1 ha = 15.15 acres (rectangular, 600 x 1100 ft, measured). **Description of Plot:** See AB 25: 987-988, 1971. **Weather:** Variable, with 3 days of morning fog and drizzle; 10 days equally divided between sunny and overcast. Spring was late this year, and a cold April brought temperatures some 4°F lower than in 1974. **Coverage:** March 16; April 10, 13, 19, 27, May 15-16, 20, 22, 26, 31; June 1, 7; between 0730 and 1500 hours. Total man-hours: 55. **Census:** Wilson's Warbler, 12 (196, 79); Rufous-sided Towhee, 4 (65, 26); Golden-crowned Kinglet, 3.5 (57, 23); Song Sparrow, 3.5; Chestnut-backed Chickadee, 3 (49, 20); Brown Creeper, 3; Wrentit, 3; Pine Siskin, 3; W. Flycatcher, 2.5; Dark-eyed Junco, 2.5; Orange-crowned Warbler, 2; Purple Finch, 2; Bewick's Wren, 1.5; Hairy Woodpecker, 1; Steller's Jay, 1; Red-breasted Nuthatch, 1; Hermit Thrush, 1; Hutton's Vireo, 1; Com. Bushtit, 0.5; Winter Wren, 0.5; Swainson's Thrush, 0.5; Allen's Hummingbird, +; Pygmy Nuthatch, +; Am. Robin, +. **Total:** 24 species; 52 territorial males (848/km², 343/100 acres). **Remarks:** Nests found: Chestnut-backed Chickadee, 4; Brown Creeper, 2. Contribution No. 120, PRBO. — ELLERY AKERS, Point Reyes Bird Observatory, Bolinas, Calif. 94924

122. PONDEROSA PINE FOREST. — **Location:** Colorado; Boulder Co., in the lower foothills 0.5 mile S of Baseline Road, Boulder, in the E part of Sect. 1, T15, R71W, 6th Principal Meridian. **Continuity:** Established 1954; 12 intermittent years. **Size:** 8.09 ha = 20 acres (rectangular, surveyed). **Description of Plot:** See AFN 8: 372, 1954. **Weather:** Boulder had an unusually late spring; there were several inches of snow in the foothills on June 10. There were 18 days of 90°F or above from the last week of June through August. **Coverage:** March 16; April 6, 13, 20, 27; May 4, 10, 25-26, June 8, 15, 24, 26, 29; July 6, 13, 20, 27; August 3, 10, 17, 24, 30; between 0500 and 1145. Total man-hours: 27. **Census:** W. Wood Pewee, 12 (148, 60); Chipping Sparrow, 7 (86, 35); Mourning Dove, 5 (62, 25); Am. Robin 5; Pygmy Nuthatch, 4 (49, 20); Solitary Vireo, 4; Mountain Chickadee, 2;

White-breasted Nuthatch, 2; W. Tanager, 2; Com Flicker, 1; Lesser Goldfinch, 1. **Total:** 13 species, 51 territorial males or females (630/km², 255/100 acres) **Remarks:** The population was slightly down this year, from 59 in 1974, 54 in 1973, and 52 in 1972. House Wren, Black-headed Grosbeak, and Pine Siskin did not nest. Starting early in March, several pines were sawed down and the branches were left in piles. Thanks to Paula Hansley and Janet Hering. — LOUISE HERING, 568 Marine Street, Boulder, Colo. 80302

123. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — **Location:** Oregon; Grant Co., Bates, 1/4 mile E of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size:** 32.38 ha = 80 acres (rectangle, laid out in 2.5 acre squares with compass and measured rope). **Description of Plot:** See AB 27: 1002-1003, 1973. **Weather:** Temperatures 30°-67°F; clear on 7 censuses and cloudy, drizzly or snowing on 7. Rain and snow amounted to 3.82 in. during the census period, while the preceding winter and spring, precipitation was for the second consecutive year above normal. The plot was covered with from 4 to 6 ft of snow on the first census but by July 9 entirely gone. **Coverage:** June 8, 21, 23, 26, 28, 30; July 2, 4-5, 9, 13-15, 18; between 0445-0820 hrs, PDST. Total man-hours: 38. **Census:** White-crowned Sparrow, 15 (46, 19); Chipping Sparrow, 13 (40, 16), Yellow-rumped Warbler, 6 (19, 8); Lincoln's Sparrow, 5 (15, 6); Am. Robin 4 (12, 5); Cassin's Finch, 4, Mountain Bluebird, 3 (9, 4); Ruby-crowned Kinglet, 3, Fox Sparrow, 3; Com. Flicker, 1.5; Mountain Chickadee, 1.5; Spotted Sandpiper, 1; Hairy Woodpecker, 1; Olive-sided Flycatcher, 1; Steller's Jay, 1; Varied Thrush, 1. **Total:** 16 species; 64 territorial males (198/km², 80/100 acres). **Remarks:** Nests located: Spotted Sandpiper, Hairy Woodpecker, Com. Flicker, Mountain Chickadee. No Lazuli Buntings were observed anywhere in the area this year. Numbers of species were up with 16 recorded compared to 12 last year, with 3 species (Hairy Woodpecker, Varied Thrush and Olive-sided Flycatcher) being new and 1 missing (Brewer's Sparrow) from the previous year. Breeding activity was notably down for 3 species, while 3 showed slight population gains, i.e. White-crowned Sparrows, up 2 pairs, Fox Sparrows up 1 and Yellow-rumped Warblers up 1. The snowpack did not seem to affect the ground nesters such as White-crowns or Lincoln's Sparrows. There has been a continuing decline of Chipping Sparrows from a high of 31 pairs in 1973 to 20 in 1974 and down to 13 pairs this year. Cassin's Finches have gone from 5 pairs in 1973, up to 10 in 1974 and then back down to 4 in 1975, which perhaps is a normal fluctuation in this population. Ruby-crowned Kinglets, while dropping from 9 pairs last year to 3 this year, were at 7 pairs in 1973. Lincoln's Sparrows have been holding their own, with 5 pairs the past 2 years, though 9 pairs were on the plot in 1973. 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.

124. COASTAL SCRUB. — **Location:** California; Marin Co., 4 miles NW of Bolinas, 0.5 mile inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 5 consecutive years. **Size:** 8.1 ha = 20 acres (approximately rectangular, 800 x 1100 ft, measured). **Description of Plot:** See AB 25: 1003-1004, 1971. **Weather:** A harsh early spring delayed breeding of resident species. The highest rainfall in 9 years occurred in March and April; mean low temperatures were 4° lower than normal in these months. **Coverage:** April 17, 23, 25, 30; May 2, 7, 9, 16, 19, 22, 28, June 5, 11; between 0700 and 1100 hours. Total man-hours: 36. **Census:** White-crowned Sparrow, 13.5 (167, 68); Wrentit, 8 (99, 40); Song Sparrow, 8; Rufous-sided Towhee, 6 (74, 30); House Finch, 4 (49, 20); Bewick's Wren, 3 (37, 15); Orange-crowned Warbler, 1. **Total:** 7 species; 43.5 territorial males (537/km², 218/100 acres). **Remarks:** Nests found (5); White-crowned Sparrow, 3; Bewick's Wren, 1; Rufous-sided Towhee, 1. Although there was a decrease in the number of breeding species from 10 to 7, compared to last year, there was an increase in territorial males from 500/km² to 537/km². Contribution No. 122, PRBO. — W. DAVID SHUFORD, *Point Reyes Bird Observatory, Bolinas, Calif. 94924*.

125. DISTURBED COASTAL SCRUB (A). — **Location:** California; Marin Co.; 3.5 miles NW of Bolinas, just inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 4.7 ha = 11.6 acres (irregular, approximately 600 x 600 ft, measured). **Description of Plot** See AB 26: 987-988, 1972. **Weather:** See Census 117 **Coverage:** May 3, 10, 15, 26-30; between 0700 and 1100 hours. Total man-hours: 20. **Census:** Song Sparrow, 5 (107, 43); Wrentit, 3 (64, 26); Am. Goldfinch, 2; White-crowned Sparrow, 2; California Quail, 1; Com. Bushtit, 1; Rufous-sided Towhee, 1; Am Robin, +. **Total:** 8 species; 15 territorial males (320/km², 129/100 acres). **Remarks:** The number of White-crowned Sparrow males has declined from 15 in 1969, 9 in 72, 5 in 73 and 74 to 2 in 1975. Contribution No 118, PRBO. — EDWARD PICCOLO, *Point Reyes Bird Observatory, Bolinas, Calif. 94924*.

126. DISTURBED COASTAL SCRUB (B). — **Location:** California, Marin Co., 3.5 miles NW of Bolinas, and 0.16 mile inside the S boundary of Point Reyes National Seashore; 37°55'N, 122°45'W, Bolinas Quadrangle, USGS. **Continuity:** Established 1971, 5 consecutive years. **Size:** 5.6 ha = 14 acres (approximately rectangular, 600 x 000 ft, measured). **Description of Plot:** See AB 25: 1002-1003, 1971. **Weather:** See Census 117. **Coverage:** April 18, 22, 29; May 6, 9, 13, 19, 29; June 4, 11; between 0630 and 1030 hours. Total man-hours: 23. **Census:** Song Sparrow, 9 (159, 64); White-crowned Sparrow, 3 (53, 21); Am Goldfinch, 3; Rufous-sided Towhee, 2; House Finch, 1; Wrentit, +. **Total:** 6 species; 18 territorial males (318/km², 129/100 acres). **Remarks:** Nests found Am. Goldfinch (3). In the 6 acres bordering the

NW edge there were 3 territorial Song Sparrows. The total of 12 male Song Sparrows is double the figure for last year. White-crowned Sparrows continue to show a decline in numbers from 1972 when there were 10.5 males. A 600 ft line transect to measure changes in vegetation reveals an increase of Coyote Bush (*Baccharis pilularis*) from 0.7% in 1969 to 3.5% in 1972 after which the numbers of this species have remained the same. However, the amount of *Baccharis* overstory has increased steadily from 5% in 1969 to 40% in 1975. For the first time many Douglas-fir seedlings were noticed. Most of these appear to be at least two years old. Contribution No. 119, PRBO. — WENDY KATZ, *Point Reyes Bird Observatory, Bolinas, Calif. 94924*

127. SERPENTINE CHAPARRAL. — **Location:** California; Napa Co., 3.2 miles SSW of Knoxville, 38°47'N, 122°22'W, Jericho Valley and Knoxville Quadrangles, USGS. **Continuity:** New. **Size:** 13.70 ha = 33.85 acres (strip consisting of 50 m on either side of a fire break 1.37 km in length, surveyed by pacing with a hand-held compass). **Description of Plot** A chaparral-covered ridge in the xeric inner coast range. A quantitative survey of woody vegetation (based on 120 square meter samples derived from 12 transects spaced 100 m apart and extending in straight lines alternatingly 10 m NE and 10 m SW of the fire break) produced the following data: average shrub height 1.3 m (range 0.4-3.6); shrub cover 70% (range 0-100), shrubs comprising 90% of the woody cover (figures following give relative density and frequency in per cents): Chamise (*Adenostoma fasciculatum*) 34, 38, Whiteleaf Manzanita (*Arctostaphylos viscida*), 32, 28, Leather Oak (*Quercus durata*), 27, 34. These shrubs, with an admixture of Jepson Ceanothus (*C. jepsonii*), Buckbrush (*C. cuneatus*), Congdon Silk-tassel (*Garrya congdonii*), Chaparral Flowering Ash (*Fraxinus dipetala*), Chaparral Flowering Current (*Ribes malvacuum*), Macnab Cypress (*Cupressus macnabiana*) and Digger Pine (*Pinus sabiniana*), form dense thickets interspersed with small open areas. These support a sparse herbaceous flora of grasses and such representative forbs as Sickle-leaved Onion (*Allium falcifolium*), Star Lily (*Zygadenus fremontii*), Yellow Mariposa Lily (*Calochortus luteus*), Ground Iris (*Iris macrosiphon*), wild parsnip (*Lomatium* sp.) and Native Am. Warrior (*Pedicularis densiflora*). Plant species composition is indicative of a serpentine (high magnesium, low calcium) substrate. **Edge:** Bordered on all sides by similar vegetation. **Topography:** Moderately steep, rocky ridge and slopes. **Elevation:** 1700-2000 ft. **Weather:** Colder and wetter than average March-April, perhaps delaying the onset of nesting. **Coverage:** April 10, 25-26; May 6, 14, 16; June 3; between dawn and 1100 hours. Total man-hours: 35. **Census:** Wrentit, 5 (36, 15); Rufous-sided Towhee, 5; Sage Sparrow, 5; Bewick's Wren, 4 (29, 12); Poor-will, 3 (22, 9); Anna's Hummingbird, 3; California Thrasher, 3; Brown-headed Cowbird, 3 females; Lesser Goldfinch, 3; Mountain Quail, 2; Blue-gray Gnatcatcher, 2; Orange-crowned Warbler, 2; Com. Bushtit, 1. **Total:** 13 species, 41 territorial males or females (299/km², 121/100 acres) **Remarks:** Nests found: Blue-gray Gnatcatcher, 1 (parasitized by cowbird); Lesser Goldfinch, 1; Sage

Sparrow, 1. Of 12 previous censuses in California chaparral, all are of the non-serpentine type (based on plant species composition). These average to 12.2 species per plot (SD 2.7) and 485 territorial males per km² (SD 107). The number of species on the present census (13) is comparable, but the number of territorial males per km² (299) is considerably lower. This census was conducted on BLM land proposed for conversion to non-native annual grasses (through chaining, burning, spraying, etc.) for the purpose of augmenting publicly subsidized irrigation of private agriculture. Thanks to Peter Brown, Sally Judy and Conner Sorenson. — DAVID A. GAINES, c/o Judy, 1717 Oleander Dr., Davis, Calif. 95616.

128. SAGE BRUSH-POTHOLE GRASSLAND. — **Location:** Montana; Powell Co., 1 mile NW of Brown's Lake; 46°58'N, 113°2'W, Brown's Lake Quadrangle, USGS. **Continuity:** New. **Size:** 42 ha = 103.8 acres (rectangular, 600 m x 700 m, measured). **Description of Plot:** No trees. The dominant shrub is Big Sagebrush (*Artemesia tridentata*), which averages 53 cm in height and comprises 21% of the ground cover. Shrubby Cinquefoil (*Potentilla fruticosa*), Spineless Horsebrush (*Tetradymia canescens*), and Rabbitbrush (*Chrysothamnus viscidiflorus*) are present to a much lesser degree. About 17% of the soil surface is exposed. The study area is grazed by 1 cow per 10-15 acres for 6 months of the year (May-Oct.). There are 12 temporary potholes, all less than 1/20 ha in size, 2 larger potholes of 2.5 ha and less than 1 m deep and a 9 ha pond up to 3 m deep. The deep pond has a dense emergent band 5-10 m wide of Hardstem Bulrush (*Scirpus acutus*) up to 2 m tall. There is one partially collapsed cabin on the site. **Edge:** Surrounded by at least 1 mile of similar habitat on all sides. There is a shallow 260-acre lake 150 m from the W border and a 450-acre public access lake 1 mile SE of the plot. The surrounding area and adjoining lake are not open to public access. **Topography:** Low hummocky ridges formed by glacial deposits. **Elevation:** 4180-4300 ft. **Weather:** Unusually cold, wet spring. **Coverage:** May 18, 24, 31; June 1, 11-12, 21, 28; July 6, 27; between 0430 and 0900 or 1900-2200. Total man-hours: 27. **Census:** Yellow-headed Blackbird, 60 (143, 58); Brewer's Sparrow, 9 (21, 9); Black Tern, 6 (14, 6); Barn Swallow, 6; Com. Yellowthroat, 4 (10, 4); Ruddy Duck, 3 (7, 3); Am. Coot, 3; Killdeer, 3; Wilson's Phalarope, 3; Savannah Sparrow, 3; Red-necked Grebe, 2; Redhead, 2; Lesser Scaup, 2; Red-winged Blackbird, 2; Vesper Sparrow, 2; Pied-billed Grebe, 1; Long-billed Marsh Wren, 1. **Total:** 17 species; 81 territorial males (193/km², 78/100 acres). **Remarks:** Nests located Red-necked Grebe, Am. Coot, Black Tern, Barn Swallow, Long-billed Marsh Wren, Yellow-headed Blackbird, Red-winged Blackbird, Vesper Sparrow, Brewer's Sparrow. — MICHAEL D. SCOTT, Route 4, Missoula, Mont. 59801.

129. COTTONWOOD RIVERBOTTOM-PASTURE. — **Location:** Colorado; Weld Co., about 6 miles S and 1 mile E of Johnstown on E bank of St. Vrain Creek and 1 mile upstream from its confluence with the South Platte River. Bordered on the E by Weld

Co. Road No. 38, S3T3N, R67W, 104°52'N, 40°14'W, Johnstown Quadrangle, USGS. **Continuity:** Established 1973; 3 consecutive years. **Size:** 71.6 ha = 176.9 acres (measured from aerial photograph with planimeter)

Description of Plot: See AB 27: 1006-1007, 1973. **Weather:** Mostly clear, occasionally overcast, warm to hot. **Coverage:** May 4, 11, 18, 25; June 1, 8, 15, 22, 29; July 7, 13; between dawn and 0930 hours. Total man-hours: 28. Com. Yellowthroat, 10 (14, 6); Starling, 8 (11, 5); Red-winged Blackbird, 7 (10, 4); Mourning Dove, 4 (6, 2); Com. Flicker, 4; E Kingbird, 4; Am. Kestrel, 3 (4, 2); Killdeer, 3; Canada Goose, 1; Ring-necked Pheasant, 1; Com. Snipe, 1; Spotted Sandpiper, 1; Screech Owl, 1; Burrowing Owl, 1; Downy Woodpecker, 1; Black-billed Magpie, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; Am Robin, 1; N. Oriole, 1; Great Horned Owl, 0.5. **Total** 23 species; 91 territorial males (127/km², 51/100 acres). **Remarks:** Major population decreases (50%) occurred in 5 species, but in 4 cases the number of territories was similar to those in 1973. The exception was the Yellow-headed Blackbird which decreased from 5 (1973) to 3 (1974) to 0 (1975) for unknown reasons. Minor population decreases occurred in 2 species, minor increases in 4, and no change in 5. Six new breeders were recorded while 8 former breeders did not have territories, although all were observed during the census period. It is interesting to note that the area supported 3 species of owls. — DALE W STAHLCKER (compiler) and PAUL E. GERTLER, Dept. of Fishery & Wildlife Biology, Colorado State University, Colo. 80523.

130. RESERVOIR SHORELINE COTTONWOOD FOREST. — **Location:** Colorado; Adams Co., Barr Lake, 3 miles SE of Brighton; parts of sections 23, 26 and 27, T1S, R66W, 39°57'N, 104°45'W, Brighton and Mile High Lakes Quadrangles, USGS. **Continuity:** New. **Size:** 29 ha = 72 acres (determined from aerial photographs). **Description of Plot:** Long and linear, following the cottonwood-willow growth at the NE edge of Barr Lake. The forest consists of mature Plains Cottonwoods (*Populus sargentii*), about 85 ft (25 m) high. The forest averages 150 ft (45 m) in width. A narrow dirt road runs through the plot paralleling the canal. Barr Lake is an irrigation reservoir and the water level varies accordingly. At the period of highest water (April and May) the forest is flooded through to the road to a depth of about 5 ft (1.5 m). In normal years, the water level has receded completely out of the forest by the middle of June. This year this did not occur until the middle of July. The forest is continuous along the edge of the lake with only a couple of short breaks. The understory consists of Peach-leaved Willows (*Salix amygdaloidea*) averaging about 15 ft (4.5 m) in height, concentrated on the E (high water level) side of the forest. All other vegetation occurring in the forest is of species adapted to the periodic flooding, predominantly Lady's Thumb (*Persicaria maculata*). At several points there are small peninsulas that are never flooded. The trees extend to the edges of these areas, with their vegetation primarily Barley (*Hordeum*) and Blue Grass (*Poa*) at the edges and Cheat Grass (*Bromus tectorum*) at the slightly higher and drier centers. Along the

perimeter road paralleling the canal is a disturbed roadside association of herbaceous plants. **Edge:** Bounded on the W by the open water or exposed mudflats, depending on the season (the former in winter, spring and early summer, the latter in late summer and fall); on the E by the Denver and Hudson Canal, with wheat fields beyond. The plot ends at the lake's dam at the N end and adjoins similar, continuous forest to the S. **Topography:** Essentially flat. **Elevation:** 5090 ft (1527 m). The road that parallels the canal is about 5 ft higher than the rest of the plot. **Weather:** Mostly warm and dry, with daily highs in the 80s and low 90s and lows in 60s and upper 50s. Most counts done in sunny weather. Wind very slight. Less than 0.5 in. of precipitation. **Coverage:** June 12, 20, 26; July 1, 10, 16; August 1; between 0700 and 1030 hours, averaging 3 hours in length. Total man-hours: 20.5. **Census:** House Wren, 10 (34, 14); Starling, 10; Red-winged Blackbird, 10; Com Yellowthroat, 9 (31, 12); Mourning Dove, 7 (24, 10), E. Kingbird, 7; N. Oriole, 7; Mallard, 6 (21, 8); Downy Woodpecker, 5 (17, 7); Black-billed Magpie, 5; Com Grackle, 5; Com. Flicker, 4 (14, 6); Am. Robin, 4; Black-capped Chickadee, 3 (10, 4); Yellow Warbler, 3; Red-headed Woodpecker, 2; Warbling Vireo, 2; Blue Grosbeak, 2; W. Kingbird, 1; Tree Swallow, 1; Barn Swallow, 1; Orchard Oriole, 1; Brown-headed Cowbird, 1; Am. Goldfinch, 1. **Total:** 24 species; 107 territorial males ($367/\text{km}^2$, 149/100 acres). **Remarks:** The nesting of a pair of Orchard Orioles represents the first time at Barr Lake and is part of the movement of this species into the Denver area. The pair raised a single Brown-headed Cowbird. The unusually long period that high water remained in the forest had no noticeable effect on breeding. This census was financed by the Colorado Division of Parks and Outdoor Recreation, the Denver Audubon Society and the Koch Exploration Company. Special thanks to Sue Merrick and Allan Stokes for help in arranging the financial assistance, to Bob Butterly and Jim Ratsloff for the plant identifications, and to Hugh Kingery who provided guidance. — ROBERT ANDREWS, 1390 S. Ivy Way, Denver, Colo. 80224

131. PAPER BIRCH FOREST. — Location: Alaska, 1 mile N of Eagle River along Chugach transmission line; $61^\circ 21' \text{N}$, $149^\circ 35' \text{W}$, Anchorage (B7) Quadrangle, USGS. **Continuity:** New. **Size:** 6 ha = 15 acres (rectangular, set up with compass and paced). **Description of Plot:** The dominant canopy tree is Paper Birch (*Betula papyrifera*). A few small White Spruce (*Picea glauca*) measuring 4 ft or less were found in the plot. The dominant ground cover plants are Red-panicle Dogwood (*Cornus racemosa*) and *Sphagnum* sp. A transmission line runs through the plot with approximately 7.5 acres on each side of a right-of-way that is approximately 100 ft wide with a dirt road running along the E side. Small White Spruce (2-10 ft) are growing in the right-of-way. **Edge:** Surrounded on all sides by similar habitat or mixed Birch and White Spruce habitat for at least 200 yards. **Topography:** Essentially flat except for small ridges and mounds. **Elevation:** 260 ft. **Weather:** Temperatures ranged between 35 and 50°F; partly cloudy during all counts. **Coverage:** May 24-26; between 0400 and 0900 hours

and 1500 and 1900 hours. Total man-hours: 6. **Census** Yellow-rumped Warbler, 3.5 (58, 23); Swainson's Thrush, 2; Dark-eyed Junco, 2; Am. Robin, 1; Varied Thrush, 1; Orange-crowned Warbler, 1. **Total** 6 species; 10.5 territorial males or females ($173/\text{km}^2$, 70/100 acres). **Remarks:** Yellow-rumped Warbler nest located. — RANDALL MADDING, WAPORA, Inc., 4901 Foley Road, Cincinnati, Ohio 45238.

132. ASPEN-WILLOW FOREST. — Location

British Columbia, ca. 5 air miles N of Smithers, on NE side of Telkwa Hi-Rd 0.5 miles NW of Glentanna cross-roads; $54^\circ 52' \text{N}$, $127^\circ 09' \text{W}$; map 93L/14E, Smithers NTS. **Continuity:** New. **Size:** 19.25 ha = 47.57 acres (rectangular, 550 x 350 m; 50 m grid lines, oriented 318° (true), set up with compass and measured rope) **Description of Plot:** An even-aged stand of Quaking Aspen (*Populus tremuloides*), with considerable amounts of willow (*Salix bebbiana*) in some areas. Most of the stand has been grazed lightly by cattle at times, but scarcely shows any effects of this except along the SE edge. Two old trails and a brush fence (involving a 20-yd cleared swath, now grown up with 10-ft saplings) cross the area. The ground cover is largely dead leaves, with the more important plants including Woodland Strawberry (*Fragaria vesca*), Heart-leaved Arnica (*Arnica cordifolia*), Violet (*Viola rugulosa*), W. Meadow-rue (*Thalictrum occidentale*), and grass. The dense shrub layer averages 4-8 ft tall, dominated by Red-osier Dogwood (*Cornus stolonifera*), Prickly Rose (*Rosa acicularis*), Thimbleberry (*Rubus parviflorus*), and Snowberry (*Symporicarpos albus*), all overgrown with Purple Pea (*Lathyrus nuttallii*). A quantitative survey of the vegetation gave: Trees 1.5 inches in diameter and over (3-inches and over), 890/acre (482/acre total basal area, 97.2 ft²/acre (85.8 ft²/acre). Species comprising 90% of total number of trees Quaking Aspen, 474, 53, 68, 100 (327, 68, 72, 100), willow, 358, 40, 27, 100 (136, 28, 23, 95). Trees by diameter size class: A (1.5-3 in.) 414, 46, 11.4, 12, B (3-6 in.) 340, 38, 37.8, 39 (340, 71, 37.8, 44); C (6-9 in.) 126, 14, 38.6, 40 (126, 26, 38.6, 45); D (9-12 in.) 16, 2, 9.4, 10 (16, 3, 9.4, 11). Shrub stems/acre, 10,000 est.; ground cover, 85%; canopy cover, 62%, mean canopy height, 45 ft (range 30-55). **Edge:** Bordered by similar forest on all sides; the road clearance, with cleared fields beyond, parallels the SW side about 100 m away; the cover is broken with clearings to SE, where pasturing has been more frequent; uphill to N the forest becomes lower and more open, with a change to conifers. **Topography:** A sidehill, sloping upwards to N, becoming steeper higher up on the plot. **Elevation:** About 1900-2100 ft. **Weather:** Generally cool, and often showery; most surveys had cloudy to overcast skies, with drizzle throughout survey on June 24: winds were light, only gusting to force 4 (Beaufort) on June 15; temperatures during surveys ranged from +1°C (34°F) to 16°C (61°F), except during the combined plant/bird survey (up to 28°C = 82°F). **Coverage:** May 31; June 2, 5, 8, 12, 15, 24, 30; July 4-5. All trips between 0503 and 1419 hr, PDT. Total man-hours 24.25. **Census:** Am. Redstart, 31 (161, 65); Warbling Vireo, 17 (88, 36); Swainson's Thrush, 10.5 (55, 22); Dusky Flycatcher, 6.5 (34, 14); MacGillivray's War-



Census 132. Waist-high shrubbery in aspen-willow forest.
Photo A.J. Erskine.

bler, 6 (31, 13); Yellow-rumped Warbler, 3.5 (18, 7); Black-capped Chickadee, 3 (16, 6); Orange-crowned Warbler, 3; Brown-headed Cowbird, 3; Am. Robin, 2; Solitary Vireo, 2; W. Wood Pewee, 1; Red-eyed Vireo, 1, Dark-eyed Junco, 1; Ruffed Grouse, +; Com. Crow, +; Lincoln's Sparrow, +. **Total:** 17 species; 90.5 territorial and non-territorial males ($470/\text{km}^2$, $190/100$ acres). **Remarks:** Birds seemed scarcer in the ungrazed area NW of the brush fence, particularly Dusky Flycatchers, Swainson's Thrushes, and Am. Redstarts. Red-eyed Vireos were not detected anywhere in the region until June 15, and the one territory here was the only one on any plot censused in the area in 1975. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

133. BLACK COTTONWOOD FLOODPLAIN FOREST. — **Location:** British Columbia, ca. 2 air miles WNW of Telkwa, on S side of Bulkley River by C.N.Ry. tracks; $54^\circ 42' \text{N}$, $127^\circ 05' 30'' \text{W}$; map 93L/11E, Telkwa, NTS. **Continuity:** New. **Size:** 16.25 ha = 40.15 acres (in two sections, one 650×150 m, between railway and river to E of a Hydro line right-of-way; the other 325×200 m, between railway and escarpment to W of Hydro line; 50 m grid lines, oriented 253° (true), set up with compass and measured rope). **Description of Plot:** A mature floodplain forest of Black Cottonwood (*Populus trichocarpa*), with smaller proportions of Quaking Aspen (*P. tremuloides*), White Spruce (*Picea glauca*), and Lodgepole Pine (*Pinus contorta*), and locally dense subcanopy of willows (*Salix* spp.) and Mountain Alder (*Alnus tenuifolia*). Several sloughs (old river channels) cut across the E part, and another borders the W part. The ground cover is dominated by

dead leaves and sticks, with Dewberry (*Rubus pubescens*), Sweet Coltsfoot (*Petasites palmatus*), and Horse tail (*Equisetum* sp.) the most important herbs. The shrub layer, about waist-high and often dense and tangled, includes Prickly Rose (*Rosa acicularis*), Red-osier Dogwood (*Cornus stolonifera*), Black Twinberry (*Lonicera involucrata*), and Squashberry (*Viburnum pauciflorum*), all overgrown with Wild Peas (*Lathyrus ochroleucus* & *L. nuttallii*). A quantitative survey of the vegetation gave: Trees 3-inches diameter and over, 237 per acre; total basal area, 170.5 ft^2 per acre. Species comprising 90% of total number of trees: Black Cottonwood, 100, 42, 72, 100; Quaking Aspen, 68, 28, 14, 45; Mountain Alder, 33, 14, 2, 82; White Spruce, 12, 5, 6, 41; Beaked Willow (*S. bebbiana*), 12, 5, 1, 55. Trees by diameter size class: A (3-6 in.) 86, 36, 9.6, 6; B (6-9 in.) 61, 26, 18.9, 11; C (9-12 in.) 37, 15, 22.2, 13; D (12-15 in.) 23, 10, 23.1, 14; E (15-21 in.) 16, 7, 28.8, 17; F (21-27 in.) 7, 3, 21.4, 13; G (27-33 in.) 4, 2, 20.1, 12; H (33-46 in.) 3, 2, 26.3, 16. Shrub stems per acre, 7,850 (est.); ground cover, 58%, canopy cover, 57%; mean canopy height, 73 ft (range 35-90). **Edge:** Bordered by similar forest on all sides, but extending little beyond the plot; to E is drier forest, mainly aspen and pine; to N the Bulkley River breaks the canopy for 50 m or more parallel to the border, with similar forest on an island beyond; the railway and hydro ROW's form the S & W borders of the E section and the N & E borders of the W section, and a swampy slough the W border of the latter, all with similar forest beyond; the escarpment, with aspen forest on the slope and pine above, rises abruptly beyond the S edge. **Topography:** Flat, nowhere more than 5 ft above river level. **Elevation:** 1600 ft. **Weather:** Generally cool,



Census 133. Scattered spruces with dense shrub layer
Photo A.J. Erskine.

and often showery; most surveys had cloudy to overcast skies, with light drizzle for brief periods twice; winds were light, except for force 3 gusting to 4 or more (Beaufort) on June 27; temperatures during surveys ranged from +3°C (37°F) to 28°C (82°F). **Coverage:** June 1, 4, 7, 10, 16, 23, 27; July 2, 6, 7; between 0506 and 1347, PDT. Total man-hours: 26.5. **Census:** Am. Redstart, 22.5 (138, 56); Warbling Vireo, 18 (111, 45); Swainson's Thrush, 8.5 (52, 21); Least Flycatcher, 8 (49, 20); N. Waterthrush, 6 (37, 15); Dusky Flycatcher, 5 (31, 12); W. Wood Pewee, 5; Pine Siskin 5; Am. Robin 4.5 (28, 11); Ruby-crowned Kinglet, 4 (25, 10); Rufous Hummingbird, 3 (18, 7); Yellow-rumped (Audubon's) Warbler, 2.5; Purple Finch, 2.5; Hammond's Flycatcher, 2; Yellow Warbler, 2; Brown-headed Cowbird, 2; Song Sparrow, 1.5; Bufflehead, 1; Ruffed Grouse, 1; Red-breasted Nuthatch, 1; Orange-crowned Warbler, 1; MacGillivray's Warbler, 1; W. Tanager, 1; Mallard, 0.5; Yellow-bellied (Red-breasted) Sapsucker, 0.5; Downy Woodpecker, 0.5; Black-capped Chickadee, 0.5; Cedar Waxwing, 0.5; Rusty Blackbird, 0.5; Dark-eyed Junco, 0.5; Red-tailed Hawk, +; Olive-sided Flycatcher, +; Tree Swallow, +. **Total:** 33 species; 111.5 territorial & non-territorial males (686/km², 278/100 acres). **Remarks:** Nests of Downy Woodpecker, Tree Swallow, Am. Robin (2), and Yellow Warbler were found. Broods of Mallard, Bufflehead, and Ruffed Grouse were seen repeatedly and Barrow's Goldeneye once. Some species showed preference for particular habitat elements: besides the duck broods, Dusky Flycatcher, Yellow Warbler, Northern Waterthrush, Rusty Blackbird, and Song Sparrow frequented the slough edges; Hammond's Flycatcher, Black-capped Chickadee, Red-breasted Nuthatch, Ruby-crowned Kinglet, Audubon's Warbler, and Western Tanager favored the areas with coniferous trees; Least Flycatchers were mainly in areas where aspens outnumbered cottonwoods; Cedar Waxwing, MacGillivray's Warbler, and Cowbird frequented openings and right-of-way edges. Most of the major species were distributed throughout the plot. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

134. BLACK SPRUCE FOREST. — **Location:** Alaska, 1.5 miles N of Eagle River along Chugach Transmission line; 61°21'N, 149°35'W, Anchorage (B7) Quadrangle, USGS. **Continuity:** New. **Size:** 6 ha = 15 acres (rectangular, set up with compass and paced). **Description of Plot:** The dominant tree is Black Spruce (*Picea mariana*). The dominant ground cover plants are Labrador Tea (*Ledum* sp.), Leatherleaf (*Chamaedaphne calyculata*), and *Sphagnum* sp. A transmission line runs through the plot with approximately 7.5 acres of the plot on each side of a right-of-way approximately 100 ft wide, with a dirt road running along the E side. Small White Spruce (*P. glauca*) (2-10 ft) are growing in the right-of-way. **Edge:** Surrounded on all sides by similar habitat for 50-100 yards. Beyond this to the E and W similar spruce habitat continues. To the N and S mixed Paper Birch (*Betula papyrifera*) and White Spruce habitat is found on the slopes. A small stream 6 ft wide runs along the

N and E edge. State Route 1 is 0.25 mile E. **Topography:** Relatively flat except for small mounds that the spruce are growing on. **Elevation:** 200 ft. **Weather:** Temperatures ranged between 35° and 50°F; partly cloudy during all counts. **Coverage:** Twice daily, May 24-26; between 0400 and 0900 hours; and 1500 and 1900 hours. Total man-hours: 6. **Census:** Yellow-rumped Warbler, 3.5 (58, 23); Swainson's Thrush, 2, Dark-eyed Junco, 2; Am. Robin, 1; Varied Thrush, 1, Orange-crowned Warbler, 1. **Total:** 6 species; 10.5 territorial males (173/km², 70/100 acres). — RANDALL MADDING, *WAPORA, Inc., 4901 Foley Road, Cincinnati, Ohio 45238.*

135. SUBALPINE CONIFER FOREST. — **Location:** British Columbia, ca. 11 air miles E of Smithers SW of Babine Lake Rd. 3 miles W of its junction with Burnt Cabin Rd., at base of Astlais (Onion) Mtn., 54°49'N, 126°50'W; map 93L15, Driftwood Creek NTS. **Continuity:** New. **Size:** 18.25 ha = 45.1 acres (parallelogram with small area omitted at S corner, NE-SW sides 550 m; width perpendicular to them 350 m; 50 m grid lines, oriented 238° (true), set up with compass and measured rope). **Description of Plot:** An even-aged forest, chiefly of Subalpine Fir (*Abies lasiocarpa*) and Engelmann Spruce (*Picea engelmannii*) with some Lodgepole Pine (*Pinus contorta*), across the bottom of a broad valley sloping downward to the W. Several small brooks cross the plot, and a boggy opening of about one acre is near the N corner. Old logging trails open the S corner to some extent (and led to omission of the most disturbed area there). The ground cover is dominated by mosses (*Pleurozium schreberi*, *Hypnum crista-castrensis*, *Hylocomium splendens*)



Census 135. Under canopy on Subalpine Conifer Forest Plot. Photo/A.J. Erskine.

needles, fallen logs, and prostrate shrubs (*Cornus canadensis*, *Rubus pedatus*, *Linnaea borealis*, *Vaccinium membranaceum*), with almost no shrub layer except some fir regeneration. A quantitative survey of the vegetation gave: Trees 3-inches in diameter and over, 467/acre; total basal area, 158.2 ft²/acre. Species comprising 90% of total number of trees: Subalpine Fir, 214, 46, 37, 94; Engelmann Spruce, 173, 37, 44, 100; Lodgepole Pine, 77, 16, 18, 56. Trees by diameter size class: A (3-6 in.) 195, 42, 21.6, 14; B (6-9 in.) 157, 34, 48.3, 30; C (9-12 in.) 78, 17, 46.9, 30; D (12-15 in.) 31, 7, 30.4, 19; E (15-19 in.) 6, 1, 11.2, 7. Shrub stems/acre (ca. 80% fir), 600; ground cover, 81%; canopy cover, 54%; mean canopy height, 58 ft (range 35-75). **Edge:** Bordered by similar forest on all sides, somewhat cut over to S; a recent burn, subsequently clear-cut, approaches to within 30 m of the N corner. **Topography:** The undulating bottom of a valley, sloping downward to the W. **Elevation:** About 3050-3100 ft. **Weather:** Generally cool, and often showery; most surveys had cloudy to overcast skies, with drizzle on 3 days; winds were light; temperatures ranged from +3° (37°F) to 14°C (57°F) on surveys, except for the combined plant/bird survey (up to 26°C = 79°F). **Coverage:** May 30; June 2, 5, 8, 12, 15, 25, 30; July 2, 5; between 0506 and 1300 hr, PDT. Total man-hours: 20 1/4. **Census:** Townsend's Warbler, 5.5 (30, 12); Ruby-crowned Kinglet, 4.5 (25, 10); Golden-crowned Kinglet, 3 (16, 7); Blackpoll Warbler, 2; Pine Siskin, 2; Dark-eyed Junco, 2; Mountain Chickadee, 1; Winter Wren, 1; Swainson's Thrush, 1; Yellow-rumped Warbler, 1; Wilson's Warbler, 1; Gray Jay, 0.5; Spruce Grouse, +; Varied Thrush, +. **Total:** 14 species; 24.5 territorial and non-territorial males (134/km², 54/100 acres). **Remarks:** Wilson's Warblers were in areas of alders along brooks. Blackpoll Warblers were also in the damper areas, where the canopy was mainly spruce rather than fir. Swainson's Thrushes were very late in setting up territories (not until after mid-June). — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A OH3.*

136. LODGEPOLE PINE FOREST. — **Location:** British Columbia, ca. 1.5 miles SW of Telkwa, to N of Telkwa River; 54°41'N, 127°05'W; map 93L/11E, Telkwa, NTS. **Continuity:** New. **Size:** 29.25 ha = 72.28 acres (rectangular, 650 x 450 m grid lines, oriented 20° true, set up with compass and measured rope). **Description of Plot:** A mixed-age stand of Lodgepole Pine (*Pinus contorta*). About 25% is dense young growth (trees 20-30 ft tall); the balance is mature (trees 50-55 ft), with about 30% quite open and 45% in closed stands. The area has been grazed lightly at some time in the past. One old trail and several cow paths cross the S end. The ground cover is of pine needles, various lichens (*Cladonia* spp.), Schreber's Moss (*Pleurozium schreberi*), Bearberry (*Arctostaphylos uva-ursi*), and Twinflower (*Linnaea borealis*). The shrub layer, very open except towards the N end, is of Soapberry (*Shepherdia canadensis*) and Prickly Rose (*Rosa acicularis*). A quantitative survey of the vegetation gave: Trees 1-1/2 inches in diameter and over (3-inches and over), 763/acre (446/acre); total basal area, 88.4 ft²/acre (79.6 ft²/acre). Species comprising 90% of



Census 136. Opening in mature Lodgepole Pine stand
Photo/A.J. Erskine.

total number of trees: Lodgepole Pine, 757, 99, 100, 100 (444, 100, 100, 100). Trees by diameter size class A (1-1/2-3 in.) 318, 42, 8.9, 10; B (3-6 in.) 303, 40 33.6, 38 (303, 68, 33.6, 42); C (6-9 in.) 132, 17, 40.5, 46 (132, 30, 40.5, 51); D (9-10 in.) 11, 1, 5.4, 6 (11, 2, 5.4, 7). Shrubs stems/acre, 315; ground cover, 60%, canopy cover, 30%; mean canopy height, 45 ft (range 20-60). **Edge:** Bordered by similar forest on all sides, the road clearance passes about 70 m from the SE corner, and swings across to S of the plot at a distance of 100 m or more; there is considerable admixture of Quaking Aspen (*Populus tremuloides*) with the pine by the road, and also to the N. **Topography:** Flat, on a sandy terrace above the junction of the Telkwa and Bulkley Rivers. **Elevation:** about 1750 ft. **Weather:** Generally cool, and often showery; most surveys had overcast skies and all had light winds; temperatures during surveys ranged from 4° to 18°C (65°F), except during the combined plant/bird survey (up to 25°C = 77°F). **Coverage:** June 1, 4, 7, 10, 14, 23, 27; July 3, 7; between 0445 and 1257, PDT. Total man-hours: 20 **Census:** Swainson's Thrush, 10 (34, 14); Dark-eyed Junco, 5.5 (19, 8); Yellow-rumped Warbler, 4 (14, 6); Pine Siskin, 1.5; Am. Robin, 1; Hermit Thrush, 1; Gray Jay, 0.5; Solitary Vireo, +. **Total:** 8 species, 23.5 territorial and non-territorial males (80/km², 33/100 acres). **Remarks:** The dominance of Swainson's Thrushes here, and in other Lodgepole Pine forests visited in northern British Columbia this year, is in marked contrast to the situation in very similar forest of Jack Pine (*Pinus banksiana*) E of the Rockies, where only Hermit Thrushes are found in pine stands. This stand had a higher tree density and basal area than Jack

Pine stands censused in past years, but it was still an open forest type. The Solitary Vireos were probably wanderers from territories in the mixed stands just off the plot. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A OH3.*

137. 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:** New. **Size:** 33 ha = 81.5 acres (square, surveyed and gridded). **Description of Plot:** A mosaic of several grass-herb-moss plant associations characteristic of polygonized tundra on the north slope coastal plain. A key feature of these plant communities (described by M. E. Britton, 1957, in *Arctic Biology*, H. P. Hansen ed., Oregon St. Univ. Press) is the fine-scaled interspersion of habitats reflecting pattern of micro-relief controlled by interactions of shallow permafrost, seasonal thaw-freeze cycle, and other physiographic factors. Because of heavy dependence of vegetation upon micro-topography, these aspects are described together. To quantify relative abundance of polygonal and vegetational forms, each (approx. 50 x 50 m) gridded sub-unit was characterized as to dominant polygon form present, following a classification scheme adapted from Walker and Webber (1974, U. S. Tundra Biome Program): Low Polygons — polygonized areas where trough to polygon-top distances are less than or equal to 20 cm, and where polygon centers remain elevated and well-drained; Low-center Polygons — trough-to-top distances not exceeding 20 cm, but with depressed centers filled with water throughout melt-off period and into mid-summer; High Polygons — trough-to-top distances in excess of 20 cm (none exceeded 60 cm on the census plot); and Mixed Polygons — a pattern of hummocky polygon rims and extensive thaw ponds with polygon heights usually in excess of 20 cm. The major

plant associations present in each of the grid units were also recorded, after the nodal system developed by Walker and Webber, and are given in order of decreasing abundance in each of the topographic categories. The relative area occupied by each topographic category and its associated vegetation was calculated by summing the number of grid units falling within a given class and making a percentage calculation: Low Polygon: 15.5% (dominated by *Carex aquatilis-Poa arctica* meadow on the polygon tops with *Carex-Eriophorum russeolum*, *Carex-Oncophorus wahlenbergii* (a moss), or *Dupontia fisheri-Eriophorum angustifolium* in the troughs). Low-center Polygons: 22% (centers characteristically *Carex-Eriophorum russeolum* meadow, occasionally with *Arctophila fulva* in permanently flooded areas; rims a mixture of *Carex-Oncophorus*, mesic *Salix rotundifolia* heath, or *Carex-Poa*). High Polygons: 1 (polygon tops with *Carex-Poa* except on highest and most exposed areas, which have *Luzula confusa* heath; troughs with *Carex-Eriophorum russeolum* or *Carex-Oncophorus*). Mixed Polygons-Thaw Ponds 48.5% (polygon centers and ponds rimmed with *Carex-Eriophorum russeolum*, with water-area centers dominated by *Arctophila fulva* (pond depths to 40 cm), rims with *Carex-Poa* or mesic *Salix rotundifolia* heath). Vegetation heights in all areas rarely exceeded 15 cm. **Edge:** Bordered on E by gravel road; all other edges were continuations of habitat. **Topography:** Flat tundra with, nearby, several low beach ridges, two large salt water lagoons, and a stream. **Elevation:** Below 50 ft. **Weather:** Average June temperature 33.7°F (departure from normal +0.7°F); max. = 58°F, min. = 20°F. Average wind speed 11.1 mph. Weather data from NOAA, Barrow, Alaska, 3 km to W. Snow melt-off largely complete by June 12, this area being among the first to clear in the vicinity. **Coverage:** Plot visited almost daily, June 6-August 30; censuses on June 12, 14, 18, 23-24, 28-29; July 3. Almost all censuses 0900-1200, with several visits in late afternoon. Total man-hours: 19, plus 50 hours additional time on the plot. **Census:** Red Phalarope, 13 (incubating males) (39, 16); Pectoral Sandpiper, 12 (incubating females) (36, 15); Lapland Longspur, 10 (30, 12); Dunlin, 5 (15, 6); Semipalmented Sandpiper, 5; Steller's Eider, 2 (incubating females); Baird's Sandpiper, 2; Snow Bunting, 1.5; Am. Golden Plover, 1; Ruddy Turnstone, 0.5; Pomarine Jaeger, 0.5; Long-billed Dowitcher, +; Snowy Owl, +. **Total:** 13 species; 52.5 territorial males or females ($159/\text{km}^2$, 64/100 acres). **Remarks** Aspects of the spacing systems of particular species led us to calculate their densities in different ways. **Pectoral Sandpiper:** Males are promiscuous breeders, yet territorial; densities of males can change abruptly and markedly as boundaries shift and numbers of residents change. Therefore, number of incubating females on the grid was considered to be a better estimate of this species' breeding effort. Still, the average number of territorial males present during the census period can be calculated: 9.3 territorial males ($28/\text{km}^2$, 11/100 acres). **Red Phalarope:** Males incubate, while neither sex shows territorial behavior; again, number of incubating birds was considered the best estimate of breeding effort. **Pomarine Jaeger:** The large size of jaeger territories combined with our knowledge of nest locations



Census 137. Mixed Polygon - Thaw Pond habitat in mid-July. Height of person, 5' 6".

over two square miles of adjacent, similar habitat (including both Plots; see census 138) made it more accurate to calculate densities based on this information rather than on fractions of territorial males using the plots. In these species, as in others, the excellent visibility on tundra and the extensive field time assured that at least 95% of all nests (except passerine) were found. Nests located: Steller's Eider, 2; Golden Plover, 1; Pectoral Sandpiper, 12; Dunlin, 6; Semipalmated Sandpiper, 6; Red Phalarope, 13; Lapland Longspur, 1; Snow Bunting, 2. Several species had poor years compared to earlier records (Pintail, Am. Golden Plover, Baird's Sandpiper, Parasitic Jaeger, and redpoll). Conversely, several species achieved exceptional densities (Steller's Eider, Pectoral Sandpiper, Red Phalarope, and Snowy Owl). For the Snowy Owl and Pomarine Jaeger, threshold densities of Brown Lemmings (*Lemmus trimucronatus*) required for breeding were present (estimated mid-June to be 5-10 lemmings/ha). Note that presence of Snow Buntings was a result of nesting cavities created by human debris. This work was funded by the ERDA as part of a study of tundra shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska, for logistic support, and Douglas Schamel for aid in locating nests. — J. P. MEYERS and F. A. PITELKA, *Museum of Vertebrate Zoology, Univ. of California, Berkeley, Calif. 94720.*

138. 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:** New. **Size:** 27 ha = 66.7 acres (rectangular, surveyed and gridded). **Description of Plot:** See Census 137., for methods and references; census plots similar except where noted below). Low Polygon: 16% (*Carex aquatilis-Oncophorus wahlenbergii* (a moss) or *Carex-Poa arctica* on polygon tops with *Carex-Oncophorus* or *Carex-Eriophorum russeolum* in troughs). Low-center Polygon: 16%; High Polygon: 6%; Mixed Polygon-Thaw Pond: 62%. **Topography and Weather:** See Census 137; but snow melt-off, which was approximately one week later on plot II. **Coverage:** June 2-August 30. Formal censuses June 23, 26; July 2; all censuses 0800-1200. Total man-hours: 12, plus 40 hours additional time on the plot. **Census:** Red Phalarope, 13 (incubating males) (48, 19); Pectoral Sandpiper, 9 (incubating females) (33, 13); Dunlin, 4.5 (17, 7); Lapland Longspur, 4 (15, 6); Steller's Eider, 2 (incubating females); Am. Golden Plover, 1.5; Ruddy Turnstone, 1.5; Semipalmated Sandpiper, 1.5; Snow Bunting, 1; Pomarine Jaeger, 0.5; Long-billed Dowitcher, +; Snowy Owl, +. **Total:** 12 species; 38.5 territorial males or females (143/km², 58/100 acres). **Remarks:** Average number of territorial male Pectorals 16.6 (61, 25). The high density of territorial male Pectorals on Plot II relative to those present on I may have been a result of timing of snow melt-off in the two areas relative to the influx of Pectorals at the onset of the breeding season. Birds arriving before peak numbers established territories in the earliest open areas. These territories may have been larger by virtue of the experience of the birds, the lower density early in the period of territory formation, and/or the effect of asyn-



Census 138. West Coastal Plain Tundra II. Extensive trough system can be seen behind and to right of person (5' 6").

chronous territorial establishment (see R. W. Knapton and J. R. Krebs, 1974, Can. J. Zool. 54: 1413-1420), the invasion of Plot II was more nearly synchronous due to the later melt-off. Nests found on plot: Stller's Eider, 2; Am. Golden Plover, 1; Ruddy Turnstone, 1, Pectoral Sandpiper, 9; Dunlin, 4; Semipalmated Sandpiper, 2; Red Phalarope, 13; Pomarine Jaeger, 2. This work was funded by the ERDA as part of a study of tundra shorebird ecology. We thank the Naval Arctic Research Laboratory, Barrow, Alaska, for logistic support, and Douglas Schamel for aid in locating nests. — J. P. MYERS and F. A. PITELKA, *Museum of Vertebrate Zoology, Univ. of California, Berkeley, Calif. 94720.*

139. BLACK SPRUCE SCRUB-MUSKEG. — **Location:** Northwest Territories, District of Mackenzie, SE end of Chick Lake, 65°50'N, 128°05'W; map 106H/16, Chick Lake, NTS. North boundary is located approximately 370 m from lake shore. **Continuity:** New. **Size:** 100.3 ha = 247.8 acres (rectangular; 914 x 1097 m; 46 m grid oriented NS: subdivided into six subplots, 457 x 366 m; each subplot is 16.7 ha = 41.3 acres, laid out by compass and measured rope). **Description of Plot:** Habitat analysis is based on a modified International Biological Program key (F. R. Fosberg, in G. F. Peterken (ed.), *Guide to the Checksheets for IBP Areas*, 1967). Five main habitats exist: (a) Open coniferous scrub (with some scattered trees) occupies 95 acres (38 ha) or 38%. Trees (greater than 15 ft high) are dominantly Black Spruce (*Picea mariana*), average distance between trunks (when trees present) 48 ft (range 25-80); average trees per acre, 16; total number of trees, 1520. White birch (*Betula papyrifera*) and Tamarack (*Larix laricina*) are also present but occur infrequently. The shrub layer (considered to be vegetation from 1.5 to 15 ft high) averages 11 ft tall when trees are not present. Black Spruce comprise 50-75% of the shrub layer. Deciduous shrubs comprise

24-50% and consist of willow (*Salix* spp.), Green Alder (*Alnus crispa*), and Dwarf Birch (*B. glandulosa*). The dwarf shrub and herb layers (less than 1.5 ft high) consist of moss (*Sphagnum* spp.), lichen (*Cladonia* spp.), Arctic Bearberry (*Arctostaphylos rubra*), Bog Bilberry (*Vaccinium uliginosum*), and Labrador Tea (*Ledum groenlandicum* and *L. palustre* var. *decumbens*) (b) Closed coniferous scrub (with some scattered trees), 82 acres (33 ha), 33%. Trees: Black Spruce, average distance between trunks (when present), 58 ft (range 25-80); average trees per acre, 10; total trees, 821, other trees as in (a). Shrub layer: average height (when trees not present), 10 ft; 75-100% Black Spruce shrub, deciduous shrubs as in (a). Dwarf shrub and herb layer as in (a). (c) Open coniferous forest: 39 acres (16 ha), 16%. Trees: Black Spruce, average height, 24 ft; (range 15-45); average distance between trunks, 13 ft; (range 7-25); average trees per acre, 235; total trees 9232, other trees as in (a). Shrub layer: equal proportions of coniferous and deciduous shrubs as in (a). Dwarf shrub and herb layer: moss, sedge (*Carex* spp.), lichen, Arctic Bearberry. (d) Closed coniferous forest: 15 acres (6 ha), 6%. Trees: Black Spruce, average height, 32 ft (range 15-45); average distance between trunks, 5 ft (range 3-7); average trees per acre, 1814; total number of trees, 27630. Shrub layer: scattered Black Spruce shrubs comprise 50-75% of shrub layer; deciduous shrubs of willow and Dwarf Birch are present. Dwarf shrub and herb layer: moss, sedge, lichen, and Bog Bilberry. (e) Open mixed scrub (with some scattered trees): 14 acres (6 ha), 6%. Trees: Black Spruce, average distance between trunks (when present), 35 ft (range 25-70) average trees per acre, 23; total trees, 335. Other trees as in (a). Shrub layer: Average height (when trees not present), 8 ft; equal proportions of coniferous and deciduous shrubs as in (a). Dwarf shrub and herb layers as in (a). (f) Three other minor habitat types exist, total: 3 acres (1 ha), 1%. An additional 45 plants have been identified. Several small shallow intermittent streams beds are present in the NW corner. Flow of water at the time of census was negligible although pools of water and brown mud were evident in the streams. A larger drainage stream with almost vertical stream banks (6 ft high) occurs halfway along the N boundary. These banks rapidly disappear to a flat bed some 100 yds into the plot. Pools of standing water occur along the N border. **Edge:** Bordered by similar vegetation on all sides; part of a large comparatively uniform area. **Topography:** Gently rising to the S. **Elevation:** 430-600 ft. **Weather:** Variable, clear to cloudy. Temperature: from 2° to 14°C; average for 9 days, 9.5°C. **Coverage:** June 4-6, 10-11, 13, 17-18, 21. Total man-hours: 138. **Census:** Tree Sparrow, 13 (13, 5); Blackpoll Warbler, 12.5; Dark-eyed Junco, 10 (10, 4); White-crowned Sparrow, 9 (9, 4), Chipping Sparrow, 5.5 (5, 2); Gray-cheeked Thrush, 2.5; Yellow-rumped Warbler, 2; N. Three-toed Woodpecker, 0.5; Swainson's Thrush, 0.5. **Total:** 9 species; 55.5 territorial males (55/km², 22/100 acres). **Remarks:** Nests located: Am. Wigeon, 1; N. Three-toed Woodpecker, 1; Dark-eyed Junco, 1; Tree Sparrow, 2; White-crowned Sparrow, 2. The density of birds in this habitat is very low. It is slightly higher than that found in 1974 (W. J. Richardson and P.

Courtney, in press). Numbers of Blackpoll Warblers, Tree Sparrows and Dark-eyed Juncos increased slightly from last year. Numbers of Gray-cheeked Thrushes and Yellow-rumped Warblers decreased slightly. The number of territorial White-crowned Sparrows increased by a factor of six. Lincoln's Sparrow and Am Robin were recorded in 1974 as having territories, neither was on territory in 1975. Funding for this research was provided by Canadian Arctic Gas Study Ltd through Northern Engineering Services Co. Ltd., Calgary. Thanks to A. N. Wiseley for assistance in preparing the manuscript. — G. RAINER A. EBEL (compiler), STEVEN W. BRADLEY, DAVID J. CLARK, RICHARD T. PALINDAT, JUDITH A. SMITH, C ERIC TULL, LGL Ltd., Environmental Research Associates, No. 201, 10110-124 Street, Edmonton, Alberta T5N 1P6.

140. DISTURBED WHITE SPRUCE STAND WITH WILLOW SWALES. — **Location:** British Columbia, ca. 5 air miles ESE of Telkwa, just W of Round Lake (Lacroix L. on some maps); 54°39'N, 126°57'W; map 93L/10W, Quick, NTS. **Continuity:** New. **Size:** 18 ha = 44.5 acres (irregular shape, a rectangle 700 m E-W by 350 m N-S with SW and SE corners omitted; 50 m grid lines, oriented 285° (true), set up with compass and measured rope). **Description of Plot:** A mixed-aged stand of White Spruce (*Picea glauca*), which was cut-over selectively in 1937, a number of trails and small clearings, fringed or grown up with Quaking Aspen (*Populus tremuloides*), break the canopy from that operation. A number of open, wet swales, with Beaked Willow (*Salix bebbiana*) trees and bushes around and scattered through them, run parallel to the N edge. The ground cover includes a variety of herbs, low shrubs, and mosses, including Dewberry (*Rubus pubescens*), Star-flowered False Solomon's Seal (*Smilacina stellata*), Twinflower (*Limnaea borealis*), Sweet Coltsfoot (*Petasites palmatus*), and Schreber's Moss (*Pleurozium schreberi*). The shrub layer is dominated by Black Twinberry (*Lonicera involucrata*), Prickly Rose (*Rosa acicularis*), and Squashberry (*Viburnum pauciflorum*), all overgrown with Purple Pea (*Lathyrus nuttallii*). A quantitative survey of the vegetation gave: Trees 3-inches in diameter and over 341 per acre; total basal area, 106.2 ft² per acre. Species comprising 90% of total number of trees: White Spruce, 253, 74, 79, 100; Quaking Aspen, 70, 20, 15, 95. Trees by diameter size class: A (3-6 in.) 159, 47, 17 6, 17; B (6-9 in.) 100, 29, 30.7, 29; C (9-12 in.) 62, 18, 37.0, 35; D (12-15 in.) 19, 6, 18.9, 18; E (15-16 in.) 2, trace, 1.9, 2. Shrub stems per acre, 3300 (est.); ground cover, 71%; canopy cover, 42%; mean canopy height, 63 ft (range 40-75). **Edge:** Bordered by similarly disturbed forest except to S; an old road ("Bishop Rd") forms the SW boundary, with similar forest beyond. A grassy clearing, with an area of 20 ft aspen and willow beyond, forms the SE boundary. A chain of Willow swales parallels the N boundary for two-thirds of its length. Round Lake lies about ¼-mile to the NE of the E end of the plot. **Topography:** Nearly level, sloping down slightly to N and E. **Elevation:** About 1950 ft. **Weather:** Generally cool, and often showery; most surveys had cloudy to overcast skies, with spatters or

drizzle on 3 days (brief periods only), winds were light, only twice attaining force 3 (Beaufort); temperatures ranged from +4° (39°) to 22°C (72°F). **Coverage:** May 31, June 3, 6, 9, 13, 22, 25, 28-29; July 4; between 0520 and 1519 hr PDT. Total man-hours: 26 ½. **Census:** Ruby-crowned Kinglet, 13 (72, 29); Swainson's Thrush, 8 (44, 18); W. Wood Pewee, 5.5 (31, 12); Golden-crowned Kinglet, 5 (28, 11); Warbling Vireo, 4.5 (25, 10); Am. Redstart, 4.5; Pine Siskin, 4 (22, 9); Red-breasted Nuthatch, 3 (17, 7); Solitary Vireo, 3; Song Sparrow, 3; Am. Robin, 2.5; White-winged Crossbill, 2.5; Yellow-rumped Warbler, 2; Red-winged Blackbird, 2; Purple Finch, 2; Black-capped Chickadee, 1.5; Orange-crowned Warbler, 1.5; N. Waterthrush, 1.5; Brown-headed Cowbird, 1.5; Dark-eyed Junco, 1.5; Hammond's Flycatcher, 1; MacGillivray's Warbler, 1; N. Yellowthroat, 1; Rusty Blackbird, 2; W. Tanager, 1; Magnolia Warbler, 0.5; Mallard, +; Great Horned Owl, +; Gray Jay, +; Chipping Sparrow, +. **Total:** 30 species; 77.5 territorial and non-territorial males ($430/\text{km}^2$, 174/100 acres). **Remarks:** Nests found Swainson's Thrush, 1. Broods were seen of Mallard, Am. Robin, Red-winged and Rusty Blackbirds, and Chipping Sparrows. The Great Horned Owl was present on 2 surveys. Numbers of the non-territorial finches are somewhat uncertain, especially for the crossbills which were not seen until June 22, but provided better "clusters" than is usual for these species. The large number of breeding species reflects the diverse habitats on the plot. The Mallards, waterthrush, yellowthroat, redstart, Red-winged and Rusty Blackbirds, and Song Sparrows were clearly associated with the wet swales, while the pewees, robins, Solitary and Warbling Vireos, Orange-crowned Warblers, and juncos were associated with the clearings or the aspens around their edges; most of the major species, however, belonged to the spruce forest. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

141. SHRUBBY SWAMP AND SEDGE HUMMOCKS. — **Location:** Connecticut; Litchfield Co.; N end of Bantam Lake, White Memorial Foundation, Litchfield, 41°43'02"N, 73°12'27"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 9 intermittent years. **Size:** 8.09 ha = 20 acres. **Description of Plot:** See AFN 19: 625-627, 1965. A river delta in two parts, 5 and 15 acres respectively, on either side of the Bantam River as it flows into Bantam Lake. **Coverage:** April 27-28; May 14-15, June 4, 6, 13, 16, 18, 21; from 0435 to 2230. Total: 24.5. **Census:** Swamp Sparrow, 30 (371, 150); Red-winged Blackbird, 25 (309, 125); Yellow Warbler, 24 (297, 120); Com. Yellowthroat, 12 (148, 60); Willow Flycatcher, 10 (124, 50); Virginia Rail, 7 (86, 35); Gray Catbird, 6 (74, 30); Cedar Waxwing, 6; Am. Goldfinch, 6; Song Sparrow, 6; Mallard, 2; Alder Flycatcher, 2; Brown-headed Cowbird, 2; Pied-billed Grebe, 1; Canada Goose, 1; Wood Duck, 1; E. Kingbird, 1; Tree Swallow, 1; Black-capped Chickadee, 1; Long-billed Marsh Wren, 1; Downy Woodpecker, 0.5; Chestnut-sided Warbler, 0.5. **Total:** 22 species; 146 territorial males ($1804/\text{km}^2$, 730/100 acres). **Remarks:** Owing to June rains, the water level, at an average of 2 ft throughout

the area, was higher than the previous year. Virginia Rails fell from 15 to 7 this year probably owing to the water rise; otherwise, change was insignificant. The area is prime feeding grounds for large numbers of Barn, Bank, and Tree Swallows, single pairs of Green Herons and Belted Kingfishers, and for the first time, up to 5 Great Blue Herons at once. This study was sponsored by the Litchfield Hills Audubon Society, Litchfield, Conn. — ANDREW MAGEE, *Woollybear Company, Troy, N. H. 03465.*

142. FLOODPLAIN POND. — **Location:** Colorado; Weld Co., about 6 miles S and 1.5 miles E of Johnstown. Parts of Sects. 34 & 35, T4N, R67W, 104°52'N; 40°15'W, Milliken Quadrangle, USGS. **Continuity:** Established 1974. **Size:** 8.5 ha = 21 acres (measured from an aerial photo with planimeter) **Description of Plot:** See AB 28: 1034-1035, 1974 **Weather:** Mostly clear, dry, and warm. **Coverage:** May 4, 11, 18, 25; June 1, 8, 14, 22, 29; between dawn and 0640. Total man-hours: 5. **Census:** Yellow-headed Blackbird, 45 (529, 214); Com. Yellowthroat, 5 (59, 24); Red-winged Blackbird, 4 (47, 19); Am. Bittern, 1; Mallard, 1; W. Meadowlark, 1. **Total:** 6 species, 57 territorial males ($671/\text{km}^2$, 271/100 acres). **Remarks:** Comparisons with 1974 data showed an increase in territorial Yellow-headed Blackbirds from 28 to 45 and a decrease in territorial Red-winged Blackbirds from 12 to 4. The study area was established to evaluate the effects of the Fort St. Vrain Nuclear Generating Station on the surrounding environment. The pond will act as an intermediate holding location for blowdown water from the cooling towers when the station becomes operative. Special thanks to Sue Quinlan, Marilyn Allen, James Durr, Herman Giese, Roger Sleeper, and John Masters for their assistance. — BRUCE R JOHNSON, *Dept. of Fishery and Wildlife Biology, Colorado State Univ., Fort Collins, Colo. 80523*

143. OPEN FIELD. — **Location:** New York, Chautauqua Co., Erie Lake Plain; 1 mile E of Route 5, Fredonia Airport Property; 42°26'34"N, 79°23'17"W, Brocton Quadrangle, USGS. **Continuity:** New **Size:** 13 ha = 32 acres (rectangular plot, plamimetered) **Description of Plot:** In the past, various cover crops were planted in the field, but it has remained uncut for 3 or 4 years. Grasses presently dominate the area. Sparsely scattered throughout the field are small bushes (3-4 ft tall) of Staghorn Sumac (*Rhus typhina*) and S Arrowwood (*Viburnum dentatum*). Quantitative description: Stem counts of plants were made in three 33 x 33 ft transects. Dominance is based on cover (line-intercept method). Species comprising 90% of the total number of plants (first figure is number of stems per ft^2): Bent Grass (*Agrostis alba*) and Canada Blue Grass (*Poa compressa*) 56.3, 48, 32, 14; Common Timothy (*Phleum pratense*) 32.1, 27, 31, 17; Slender Wheat Grass (*Agropyron trachycaulum*) 9.7, 8, 14, 13, Aster and goldenrod 1.3, 1, 9, 9; Path Rush (*Juncus tenuis*) 5.6, 5, 1, 9; Sheep Sorrel (*Rumex acetosella*) 1.6, 1, 2, 8. **Edge:** Bordered on two sides by packed soil runways, and on the other two sides by hedgerows of shrubs. **Topography:** Essentially flat lake plain. **Elevation:** 620 ft. **Coverage:** May 13-15, 18; June 4, 10, 17,

20, 24, about 1.5 hours beginning 0545-0645. Total man-hours: 12.5. **Census:** Red-winged Blackbird, 13 (100, 41); Henslow's Sparrow, 13; Savannah Sparrow, 7 (54, 22); Bobolink, 3 (34, 9); E. Meadowlark, 1; Dickcissel, 1; Grasshopper Sparrow, 1. **Total:** 7 species, 39 territorial males ($301/\text{km}^2$, 122/100 acres). **Remarks:** Nests or young observed for all species except Dickcissel. This census was funded as part of a larger study by Niagara Mohawk Power Corporation. — ROY S. SLACK, CATHIE A. BAUMGARTNER, and JOE McMULLEN, *Environmental Analysts, Inc.*, 333 Crossways Park Drive, Woodbury, N. Y. 11797.

144. VINEYARD I. — **Location:** New York; Chautauqua Co., 0.2 mile N of intersection of Center Road and Waite Road; $42^\circ 32' \text{N}$, $79^\circ 14' \text{W}$, Silver Creek Quadrangle, USGS. **Continuity:** New. **Size:** 10.1 ha = 25 acres. **Description of Plot:** The vineyards are composed of rows of the Concord variety of commercial grapes (*Vitis* sp.). The vines grow along single strung wires stretched between wooden poles which are placed in rows approximately 9 ft apart. Vegetative growth of the grapes reduces the distance between the rows to about 5.5 ft at shoulder height, and reaches a height of approximately 6.6 ft. Common Plantain (*Plantago major*), Narrow Leaved Plantain (*P. lanceolata*), and Dandelion (*Taraxacum officinale*) are the most common herbaceous plants. Occasionally grasses such as Italian Rye Grass (*Lolium multiflorum*), Com. Timothy (*Phleum pratense*), Quackgrass (*Agropyron repens*), and Bentgrass (*Agrostis* sp.) predominate between the rows. **Edge:** Bordered on two sides by vineyard, and on one side by a road. The remaining edge is about $\frac{1}{3}$ grain field and $\frac{1}{3}$ vineyard. **Topography:** Essentially flat, on the Erie Lake Plain. **Elevation:** 680 ft. **Weather:** Moderate, no rain on census days. **Coverage:** May 16, 19-20, 22; June 7, 10-11, 17; between 0626 and 0900. Total man-hours: 9.5. **Census:** Am. Robin, 2, Chipping Sparrow, 2; Field Sparrow, 2; Song Sparrow, 1; 5; Red-winged Blackbird, 1; Upland Sandpiper, 0.5; Horned Lark, 0.5; Savannah Sparrow, 0.5. **Total:** 8 species; 10 territorial males or females ($99/\text{km}^2$, 40/100 acres). **Remarks:** Nests located: Am. Robin, 1; Field Sparrow, 1; Song Sparrow, 1. Young Savannah Sparrows and Upland Sandpipers seen in census area. Special thanks to Joe McMullen for habitat description and Jim Henriksen for assistance. This census was funded as part of a larger study by Niagara-Mohawk Power Corporation. — ROY S. SLACK (compiler), CATHIE A. BAUMGARTNER, and VINCENT J. LUCID, *Environmental Analysts, Inc.*, 333 Crossways Park Drive, Woodbury, N. Y. 11797.

145. VINEYARD II. — **Location:** New York; Chautauqua Co., 100 yds N of intersection of Lowell and Lake Roads; $42^\circ 25' 21'' \text{N}$, $79^\circ 24' 5'' \text{W}$, Brocton Quadrangle, USGS. **Continuity:** New. **Size:** 10.1 ha = 25 acres (two plots, irregular, planimetered). **Description of Plot:** This plot is similar to Census No. 144 except that vegetative growth of the grapes reduces the distance between rows to about 5 ft at shoulder height,

vegetative growth reaches a height of about 6 ft and, the most abundant herbaceous species between rows are Com. Plantain (*Plantago major*) and Narrow Leaved Plantain (*P. lanceolata*), with some areas dominated by Horsetail (*Equisetum arvense*) and bindweed (*Convolvulus* sp.). **Edge:** Bordered on two sides by open field and shrubs and on the remaining two sides by roads, open fields, and residential area. **Topography:** Essentially flat, on Erie Lake Plain. **Elevation:** 660 ft **Weather:** Moderate, no rain on census mornings **Coverage:** May 22-23; June 6-7, 10, 19, 21, 24. Total man-hours: 12. **Census:** Song Sparrow, 6 (59, 24), Field Sparrow, 2.5; Chipping Sparrow, 2; House Wren, 1; Am. Robin, 1; Killdeer, +. **Total:** 6 species, 13 territorial males ($128/\text{km}^2$, 52/100 acres). **Remarks:** Special thanks to Joe McMullen for the vegetative description. This census was funded by Niagara-Mohawk Power Corporation as part of a larger study. — ROY S. SLACK (compiler), LYNN BRABAND, and HARRY E. SLACK III, *Environmental Analysts, Inc.* 333 Crossways Park Drive, Woodbury, N.Y. 11797 and (3rd author) 1316 Huntington Avenue, Huntington, W. V. 25701

146. RECENTLY ABANDONED PASTURE. — **Location:** Pennsylvania; Perry Co., in F. J. Reineman Wildlife Sanctuary, Green Valley, 13 km NW Carlisle, $40^\circ 17' 00'' \text{N}$, $77^\circ 17' 30'' \text{W}$, Landisburg Quadrangle, USGS. **Continuity:** New. **Size:** 12.4 ha = 30.6 acres (wedge-shaped, determined from aerial photographs) **Description of Plot:** Last planted in hay approximately 3 years ago, and last heavily grazed in 1974. A stream runs through the center of the field. Several low wet areas are found in the pasture. Farm buildings border the plot, but were not included. Less than one dozen trees are included within the edges of the pasture, largely Black Locust. **Edge:** Bordered on one side by additional pasture, and Pa. Route 74, a two lane road, and on the other sides by deciduous forest last harvested, for the most part, 40 - 60 years ago. Birds in this edge were included in the census only if their activity was obviously oriented toward the pasture. **Topography:** Essentially flat, sloping down to the narrower end. **Elevation:** 180 to 230 m. **Weather:** Essentially normal for the period, warm to mild with some shower activity. **Coverage:** June 9, 17, 20-21, 23, 25, 30; July 3, 6, 8. Ten censuses taken at various times during the day. Total man-hours: 31. **Census:** Red-winged Blackbird, 10.5 (85, 34); E. Meadowlark, 2; Mourning Dove, 1.5; Sparrow Hawk, +. **Total:** 4 species; 14 territorial males ($113/\text{km}^2$, 46/100 acres) **Remarks:** This pasture is essentially in the first year of succession. Thanks to Roger Low, Joseph Hulihan, and Jean Raymond for assistance. — C. JOHN RALPH, Dept of Biology, Dickinson College, Carlisle, Pa. 17013

147. OLD FIELD. — **Location:** Pennsylvania, Schuylkill Co., 1 mile SW of the village of Weishamptown; $40^\circ 41' \text{N}$, $76^\circ 27' \text{W}$, Tremont Quadrangle, USGS **Continuity:** Established 1974. **Size:** 7.12 ha = 17.58 acres (basically square, 850 ft N-S by 900 ft E-W, delineated by wooden stakes into 16 plots each measur-

ing 170 ft N-S by 180 ft E-W using compass and steel tape) **Description of Plot:** See AB 28: 1053, 1974. **Weather:** Cool to moderately warm; temperatures 49°-67°F Most days clear with some early morning fog. **Coverage:** May 22; June 1-2, 11, 19-20, 27, 30; between 0535 and 0800. Total man-hours: 8.5. **Census:** Field Sparrow, 18 (253, 102); Indigo Bunting, 3 (42, 17); House Wren, 2; Gray Catbird, 2; Com. Yellowthroat, 2; Cardinal, 2; Am. Goldfinch, 2; Rufous-sided Towhee, 2; Song Sparrow, 2; Wood Thrush, 1; E. Bluebird, 1; Blue-winged Warbler, 1; Prairie Warbler, 1, Yellow-billed Cuckoo, +; Ruby-throated Hummingbird, +; Golden-winged Warbler, +. **Total:** 16 species; 39 territorial males or females ($548/\text{km}^2$, 222/100 acres). **Remarks:** Eastern Bluebirds and House Wrens nested in boxes. A Field Sparrow nest was found — ROLAND BERGNER, William Penn Memorial Museum, Box 1026, Harrisburg, Pa. 17120.

148. ABANDONED FIELD. — **Location:** Maryland, Prince Georges Co., Accokeek, Piscataway Park, Potomac River, 3 miles W intersection of Route 210 and Bryan Point Road; $38^\circ 41' \text{N}$, $77^\circ 4' \text{W}$, Mt. Vernon Quadrangle, USGS. **Continuity:** Established 1972; 4 consecutive years. **Size:** 6.1 ha = 15.0 acres (irregular parallelogram, delineated by steel stakes into one-half acre plots using steel tape). **Description of Plot:** See AB 26: 995-996, 1972. **Weather:** The summer was exceptionally wet. Temperatures were normal. **Coverage:** April 27; May 6, 12, 19, 22, 26; June 3, 9, 29; July 2; mostly between 0725 and 1020. Total man-hours 20.75. **Census:** Field Sparrow, 5 (82, 33); Indigo Bunting, 4 (66, 27); Com. Yellowthroat, 3 (49, 20); Cardinal, 2; Am. Goldfinch, 2; Song Sparrow, 2; Bobwhite, 1; E. Kingbird, 1; E. Bluebird, 1; Yellow-breasted Chat, 1; Blue Grosbeak, 1. **Total:** 11 species; 23 territorial males or females ($379/\text{km}^2$, 153/100 acres) **Remarks:** Nest found: E. Bluebird. Yellow-breasted Chat was recorded for the first time. Song Sparrow and Am. Goldfinch density increased while Com. Yellowthroat and Field Sparrow decreased. Overall density increased slightly but is still below that of 1972. — LEONARD TEUBER and M. KATHLEEN KLIMKIEWICZ (compiler), 13117 Larchdale Rd., No. 2, Laurel, Md. 20811.

149. ABANDONED TURF FIELD. **Location:** Maryland; Montgomery Co., McKee-Beshers Wildlife Management Area; $39^\circ 04' 32'' \text{N}$, $77^\circ 23' 18'' \text{W}$, Sterling Quadrangle, USGS. **Continuity:** New. **Size:** 6.3 ha = 15.6 acres (roughly rectangular, ca. 600 ft by 1200 ft with the long axis running E-W). **Description of Plot:** On the Potomac River floodplain, 3000 ft from the river bank. The terrain is flat; maximum elevation 195 ft. Previously it had been a commercial turf field, last harvested in 1973. The main ground cover is Fescue Grass (*Festuca* sp.), Red Clover (*Trifolium pratense*), and White Clover (*T. repens*). Rising to a height of 3 ft is a dense herbaceous layer of mainly Small White Aster (*Aster vimineus*) with a scattering of Horseweed (*Erigeron canadensis*), Com. Sow Thistle (*Sonchus*

oleraceus), Evening Primrose (*Oenothera biennis*), Curled Dock (*Rumex crispus*), Pasture Thistle (*Cirsium pumilum*), Com. Mullein (*Verbascum thapsus*), and Broomsedge (*Andropogon virginicus*). Along the N boundary is much Early Goldenrod (*Solidago juncea*), and on the S boundary, where it is wetter, there is a dense growth of Tickseed Sunflowers (*Bidens* sp.), Swamp Smartweed (*Polygonum coccineum*), Boneset (*Eupatorium perfoliatum*), and Great Lobelia (*Lobelia siphilitica*). Adjacent to this area on the N is a 6 ft wide strip of Com. Sow Thistle. The plot is surrounded on the N by a cornfield (*Zea mays*), on the E by a 40 ft high hedgerow of Am. Elm (*Ulmus americana*), and on the W by an overgrown field. **Coverage:** April 11, 16, 22, 29; May 8, 13, 17, 20; June 2, 8, 11, 17, 27-28, July 4, 15, 24, 29; August 5, 13. Total man-hours 6 **Census:** Grasshopper Sparrow, 4 (63, 26); Field Sparrow, 3 (48, 19); E. Meadowlark, 1; Indigo Bunting, 1 **Total:** 4 species; 9 territorial males ($143/\text{km}^2$, 58/100 acres). **Remarks:** Nests found: Field Sparrow, 1 Bill Larned of the Maryland Wildlife Administration helped establish this study area. — PAUL W. WOODWARD, 2433 Southgate Sq., Reston, Va. 22091.

150. GRASSLAND. — **Location:** North Carolina, Wilkes Co., border of North Wilkesboro. **Continuity:** Established 1974. **Size:** 100 acres. **Description of Plot:** See AB 28: 1005, 1974. Only change has been growth of Box-Elder (*Acer negundo*) and Com. Elder (*Sambucus canadensis*) on some four acres adjoining the river channel. Also, penetration of these species into the banks of the abandoned river channel, approaching a thicket in some areas. **Coverage:** April 15, 28, May 4, 11, 17, 23, 29; June 3, 12, 17. Total man-hours 25 **Coverage:** Song Sparrow, 6 (15, 6); E. Meadowlark, 4 (10, 4); Bobwhite, 3 (7, 3); Am. Robin, 3; Cardinal, 3; Mourning Dove, 2; Carolina Wren, 2; Red-winged Blackbird, 2; Killdeer, 1; Com. Flicker, 1 E Kingbird, 1; Carolina Chickadee, 1; Mockingbird, 1 Gray Catbird, 1; Red-eyed Vireo, 1; Yellow Warbler, 1; Com. Yellowthroat, 1; Yellow-breasted Chat, 1; Blue Grosbeak, 1; Indigo Bunting, 1. **Total:** 20 species, 37 territorial males ($91/\text{km}^2$, 37/100 acres). — WENDELL P. SMITH, North Wilkesboro, N. C. 28659

151. PASTURE. — **Location:** Tennessee; Hawkins Co., Phipps Bend, about 3 miles E of Surgoinsville, $36^\circ 28' \text{N}$, $82^\circ 48' \text{W}$, Stony Point Quadrangle, USGS. **Continuity:** New. **Size:** 20.6 ha = 51 acres (irregular rectangle, measured with compass and 256 ft nylon string). **Description of Plot:** Consisted of adjacent pasture fields which were separated by two fences and crossed by a small creek. About 40% was covered in short cropped pasture grasses and grazing was heavy on this section. Broomsedge (*Andropogon virginicus*) covered approximately 25% of the plot. About 20% was covered in weeds and blackberry thickets (*Rubus* sp.) Goldenrod (*Solidago* spp.), Poison Hemlock (*Conium maculatum*), and Com. Milkweed (*Asclepius syriaca*) were the most prominent herbaceous plants in this part

A small field with a dense cover of clover (*Trifolium* spp.) along with some tall pasture grasses counted for about 15% of the study area. The creek was about 6 ft wide and one ft deep. Box-Elder (*Acer negundo*) lined most of the stream. Dense undergrowth was present along the section of the creek which passed through the weedy area. **Topography:** Flat, elevation 1100 ft. **Weather:** Warm and wet. **Coverage 1974:** June 5, 7-15, between 0545 and 1130, and 1900 and 2050, EDST Total man-hours: 21. **Census 1974:** E. Meadowlark, 8 (39, 16); Song Sparrow, 7 (34, 14); Field Sparrow, 6.5 (31, 13); Indigo Bunting, 5 (24, 10); Com. Yellowthroat, 4 (19, 8); Red-winged Blackbird, 4; Yellow Warbler, 3 (15, 6); Cardinal, 3; Bobwhite, 2; Willow Flycatcher, 2; Yellow-billed Cuckoo, 1.5; Grasshopper Sparrow, 1.5; E. Kingbird, 1; Orchard Oriole, 1, Carolina Wren, 0.5. **Total:** 15 species; 50 territorial males (242/km², 98/100 acres). **Remarks:** About 10 head of cattle were present during the census. Nests: Cardinal 1. This study was done as part of an Environmental Impact Statement for the Tennessee Valley Authority — RICHARD P. LEWIS, Rt. 3 Box 683B, Erwin, Tenn. 37650.

152. ABANDONED OLD FIELD. — **Location:** Indiana, Spencer Co., about 1 mile W of Grandview;

37°32'30"N, 87°00'W, Rockport Quadrangle, USGS **Continuity:** New. **Size:** 9.7 ha = 24 acres (rectangular, 8 x 3 acres, measured with a compass and steel tape **Description of Plot:** Located 2 miles N of the Ohio River. The dominant plants are: Beard Grass (*Andropogon* sp.), bog rush (*Juncus* sp.), sedge (*Cyperus* sp.), foxtail (*Setaria* sp.) and *Aster* sp. The dominant tree, Sweet Gum (*Liquidambar styraciflua*), average 3 ft in height. There are two large Pin Oaks (*Quercus palustris*). **Topography:** Essentially flat; elevation 393 ft **Edge:** Surrounded on all sides by similar habitat for 100 yds. Beyond this are small sections of similar abandoned old fields, cultivated fields and swamp forests **Water:** owing to the flat topography and low elevation drainage is poor and water from 6 to 18 in. covered 75% of the plot during the study. **Weather:** Temperatures ranged between 48° and 79°F. **Coverage:** April 2, 4, 7-8, 11, 23, 25, 28-30; between 0700 and 1100 Total man-hours: 7.5. **Census:** Red-winged Blackbird, 5 (51, 21); Field Sparrow, 3 (31, 13); Song Sparrow, 3, E. Meadowlark, 1; Com. Yellowthroat, 1; Cardinal, 1, Swamp Sparrow, 1. **Total:** 7 species; 16 territorial males or females (165/km², 67/100 acres). — RANDALL MADDING, WAPORA, Inc., 4901 Foley Road, Cincinnati, Ohio, 45238.

Breeding Bird Populations of Grasslands and Croplands in West-central North Dakota

The following 12 censuses are on various grasslands and croplands of a proposed coal strip-mining area in west-central North Dakota. The area under investigation (187.5 square miles) is located approximately in the center of Dunn County. Topography is best described as gently rolling, with approximately 1600 acres of fresh water marsh. The study was initiated to obtain baseline data describing the existing ecological setting in order to assess the environmental effects of construction and operation of a surface mine and gasification complex. The study plots for censusing birds were selected from three strata; rangeland, cropland, and mixed areas. Rangeland and cropland plots were located approximately in the center of a homogeneous quarter section. Mixed plots consisted of one half rangeland, the other half cropland, separated by a barbed wire fence. The wire fence was purposely included in the plot because it is a very prominent structure on range and cropland habitat, and it is used as song perches by certain species such as the W. Meadowlark, Red-winged Blackbird, Brown-headed Cowbird, and Lark Bunting. Since the mixed plots contain two types of habitat, the census section of these reports includes the territorial breeding species for the crop side, the range side, and the total. Non-territorial breeders are presented for the total area only.

Weather data are available from the Lake Ilo National Wildlife Refuge, directly adjacent to the west-central edge of the study area. Spring temperatures were slightly below the norm, with an average low of 51°F and an average high of 74° in June. Precipitation

was unusually high with 15.28 in. recorded for January - June; the norm for this period is 8.04. Precipitation for May and June was 1.56 in. above the norm. Censuses were conducted during periods of clear weather, usually when the wind was relatively calm. Scientific names of plants basically follow Gleason and Cronquist (1963, *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*). Scientific names of the plants are presented only after the first mention of the common name throughout the 12 censuses, Numbers 153 through 164. We gratefully acknowledge the assistance of Nick Zaczkoski and Jon Morken who aided in describing the range conditions and identifying the plants, and J. F. Cassel who aided the study in numerous ways. — LARRY D. VOORHEES, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102

153. NATIVE RANGE (I). — **Location:** North Dakota; Dunn Co., N half SE quarter and S half NE quarter of Sect. 19, T144N, R94W, 4-½ mi. S, ½ mi W Dunn Center. **Continuity:** New. **Size:** About 10 12 ha = 25 acres (square, 348 yards paced). **Description of Plot:** This area has a long history of grazing with the present range condition being good (approximately 60% of climax). A draw runs through the E ¼ of the plot from S to N. The dominant upland grasses and forbs are Prairie Junegrass (*Koeleria cristata*), Needleleaf Sedge (*Carex stenophylla*), Prairie Birdsfoot Trefoil (*Lotus purshianus*), Silverleaf Scurfpea (*Psoralea argophylla*), and Broomweed (*Gutierrezia sarothrae*). Other grasses and forbs present on the area include Blue Grama

(*Bouteloua gracilis*), Needle-and-Thread (*Stipa comata*) Green Needlegrass (*Stipa viridula*), W. Wheatgrass (*Agropyron smithii*), Big Sandgrass (*Calamovilfa longifolia*), Quackgrass (*A. repens*), Cudweed Sagewort (*Artemisia ludoviciana*), Fringed Sagewort (*A. frigida*), Purple Coneflower (*Echinacea angustifolia*), Purple Loco (*Oxytropis lambertii*), Pursh's Plantain (*Plantago patagonica*), Prairie Coneflower (*Ratibida columnifera*), Owl Clover (*Orthocarpus luteus*), False Lupine (*Thermopsis rhumbifolia*), White Prairieclover (*Petalostemum albidum*), Purple Prairieclover (*Petalostemum purpureum*), Green Sagewort (*Artemisia glauca*), Dwarf Sagebrush (*Artemisia cana*), Pulse Milkvetch (*Astragalus tenellus*), Western Yarrow (*Achillea millefolium*), Winter Fat (*Eurotia lanata*), White Prairie Aster (*Aster ericoides*), Soft Goldenrod (*Solidago mollis*), and Early Goldenrod (*Solidago missouriensis*). Grasses and forbs found in the draw include Wild Bergamot (*Monarda fistulosa*), Kentucky Bluegrass (*Poa pratensis*), and N. Bedstraw (*Galium boreale*). Woody species in the draw are Wild Prairie Rose (*Rosa arkansana*), and Wolfberry (*Syphoricarpos occidentalis*). **Edge:** A zone of at least 30 m of similar vegetation exists on all sides. **Topography:** Rolling hills fairly steep in places ranging from 2340 to 2400 ft. **Coverage:** May 31; June 4, 10, 16, 19, 26; mostly between 0435 and 0840. Total man-hours: 9. **Census:** Chestnut-collared Longspur, 19 (188, 76); W. Meadowlark, 5 (49, 20); Lark Bunting, 5; Grasshopper Sparrow, 5; Horned Lark, 3 (30, 12); Rusty Blackbird, 1; Clay-colored Sparrow, 1. Sharp-tailed Grouse, non-territorial, averaged 2 birds per trip. **Total:** 8 species; territorial and non-territorial males (395/km², 160/100 acres) **Remarks:** 7 nests were found: Chestnut-collared Longspur 5; Horned Lark, 1 with 1 cowbird egg; Rusty Blackbird, 1 with 1 cowbird egg. — GLENN M. BAUMANN., Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

154. NATIVE RANGE (II). — **Location:** North Dakota; Dunn Co., NE quarter of Sect. 19, T144N, R94W, 4-½ mi. S, ½ mi. W Dunn Center. **Continuity:** New. **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** This area has a long history of grazing with the present range condition being good (approximately 60% of climax). A prominent draw runs through the S ¼ of the plot from W to E. The dominant upland grasses and forbs are Prairie Junegrass, Needleleaf Sedge, Prairie Birdsfoot Trefoil, Silverleaf Scurfpea, and Broomweed. Other grasses and forbs present on the area are Blue Grama, Needle-and-Thread, Green Needlegrass, W. Wheatgrass, Big Sandgrass, Quackgrass, Cudweed Sagewort, Fringed Sagewort, Purple Coneflower, Purple Loco, Pursh's Plantain, Prairie Coneflower, Purple Prairieclover, Owl Clover, False Lupine, White Prairieclover, Green Sagewort, Dwarf Sagebrush, Pulse Milkvetch, W. Yarrow, Winter Fat, White Prairie Aster, Soft Goldenrod, Early Goldenrod, Prickly Pear (*Opuntia polycantha*), Butte Candle (*Cryptantha bradburiana*), Yellow Wild Buckwheat (*Eriogonum flavum*), Indian Breadroot (*Psoralea esculenta*), Clammy Weed (*Polanisia dodecandra*), and Skeleton Weed (*Lygodesmia juncea*). Abundant vegetation in the draw includes Wild Bergamot, Kentucky Bluegrass, and N. Bedstraw. Woody

species in the draw are Wild Prairie Rose and Wolfberry. **Edge:** A zone of at least 30 m of similar vegetation exists on all sides. **Topography:** Rolling hills ranging from 2320 to 2360 ft. **Coverage:** May 31, June 4, 10, 16, 19, 26; mostly from 0440 to 0710 Total man-hours: 11. **Census:** Chestnut-collared Longspur, 17 (168, 68); Lark Bunting, 5 (49, 20), Horned Lark, 4 (40, 16); W. Meadowlark, 3 (30, 12), Red-winged Blackbird, 1; Grasshopper Sparrow, 1, Sharp-tailed Grouse, +. **Total:** 7 species; 16 territorial males (158/km², 64/100 acres). **Remarks:** Nests located: Chestnut-collared Longspur, 2 (both with cowbird eggs); W. Meadowlark, 1. — GLENN M BAUMANN, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

155. NATIVE RANGE (III). — **Location:** North Dakota; Dunn Co., NE quarter of Sect. 7, T144N, R94W, 2-½ mi. S, ½ mi W Dunn Center. **Continuity:** New. **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** This grassland has a long history of grazing. Presently, the range condition is excellent (approximately 78% of climax). A seasonably moist draw, traversing W to E, approximately bisects this plot. The dominant upland grasses and forbs are W. Wheatgrass, Prairie Junegrass, Blue Grama, Needleleaf Sedge, Pursh's Plantain, Prairie Birdsfoot Trefoil, Silverleaf Scurfpea, W. Yarrow, Fringed Sagewort, Cudweed Sagewort, Blue Wild Lettuce (*Lactuca pulchella*), and Wild Vetch (*Vicia americana*). Other widely scattered plants are Needle-and-Thread, Green Needlegrass, Kentucky Bluegrass, Purple Coneflower, Prairie Coneflower, White Prairie Aster, Scarlet Mallow (*Sphaeralcea coccinea*), Collomia (*Collomia linearis*), Brittle Prickly Pear, Large Goatsbeard (*Tragopogon dubius*), Dwarf Sagebrush, and Broomweed. Abundant vegetation of the draw includes Wolfberry, Fowl Bluegrass (*Poa palustris*), Prairie Cordgrass (*Spartina pectinata*), and Big Bluestem (*Andropogon gerardii*). **Edge:** A buffer zone of at least 30 m of similar vegetation exists on all sides. **Topography:** Rolling hills with draw, varying from about 2240 to 2270 ft. **Coverage:** May 31; June 4, 10, 16, 19, 26; mostly from 0510 to 0900. Total man-hours 9 **Census:** Chestnut-collared Longspur, 17 (168, 68), W Meadowlark, 4 (40, 16); Killdeer, 1; Horned Lark, 1, Lark Bunting, 1. **Total:** 5 species; 24 territorial males (237/km², 96/100 acres). **Remarks:** Nests located Chestnut-collared Longspur, 2; W. Meadowlark, 1 — LARRY D. VOORHEES, Zoology Dept., North State University, Fargo, N. D. 58102.

156. SEEDED RANGE (I). — **Location:** North Dakota; Dunn Co., NW quarter of Sect. 4, T144N, R93W, 6 mi. E, 1 mi. S Dunn Center. **Continuity:** New. **Size:** 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** This range, seeded in the late 1930s, contains a small draw running N and S about 15 m from the W border. A contiguous native tract of land had a very low good range condition (approximately 53% of climax). The dominant grasses and forbs are Crested Wheatgrass (*Agropyron desertorum*), Blue Grama, Needleleaf Sedge, Prairie

Birdsfoot Trefoil, Yellow Sweetclover (*Melilotus officinalis*), and Fringed Sagewort. Less prominent vegetation includes Needle-and-Thread, Green Needlegrass (*Stipa viridula*), Red Threawn (*Aristida longiseta*), Daisy Fleabane (*Erigeron strigosus*), Prairie Coneflower, Curlycup Gumweed (*Grindelia squarrosa*), Harry Goldaster (*Chrysopsis villosa*), Silverleaf Scurfpea, Purple Prairieclover, Purple Coneflower, Cudweed Sagewort, and Blue Wild Lettuce. Additional vegetation occurring in the draw includes Common Ragweed (*Ambrosia artemisiifolia*), W. Yarrow, Willow-leaved Dock (*Rumex mexicanus*), White Prairie Aster, Foxtail Barley (*Hordeum jubatum*), Marsh Yellowcress (*Rorippa islandica*), and Stiff Goldenrod (*Solidago rigida*). **Edge:** Bordered on the N by a barbed wire fence separating the plot from similar range, on the E by similar range, and on the S by a barbed wire fence, a section of shelter belt and 20 m of similar range, and a gravel driveway and on the W by 30 m of similar range, a barbed wire fence and a country gravel road. **Topography:** Gentle rolling hills; elevation approximately 2210 ft. **Coverage:** May 31; June 4, 10, 17, 19, 23; mostly from 0500 to 0910. Total man-hours: 8. **Census:** Chestnut-collared Longspur, 15 (148, 60); W. Meadowlark, 0.5; Brown-headed Cowbird, 0.5 (female). **Total:** 3 species; 16 territorial males ($158/\text{km}^2$, 64/100 acres). — MARTHA CARLISLE, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

157. SEEDED RANGE (II). — **Location:** North Dakota; Dunn Co., NE quarter of Sect. 9, T144N, R94W, 2- $\frac{1}{2}$ mi. S, 1 mi. E Dunn Center. **Continuity:** New. **Size:** About 10.12 = 25 acres (square, 348 yards, paced). **Description of Plot:** This range was seeded approximately in the late 1930s with Crested Wheatgrass. Since then, native species have slowly been invading the area. The dominant grasses and forbs in the range are Crested Wheatgrass and Prairie Birdsfoot Trefoil. Other widely scattered grasses and forbs include Needle-and-Thread, Red Threawn, Kentucky Bluegrass, Green Needlegrass, Prairie Coneflower (*Ratibida columnifera*), Silverleaf Scurfpea, Fringed Sagewort, Whorled Milkweed (*Asclepias verticillata*), Wormwood (*Artemisia caudata*), Daisy Fleabane, Stiff Goldenrod, Pepperweed (*Lepidium densiflorum*), Large Goatsbeard, Skeleton Weed, Pursh's Plantain, Wild Vetch, Purple Loco, Rockcress (*Arabis holboellii*), Blue Wild Lettuce, Cudweed, Sagewort, Needleleaf Sedge, Fescue Sedge (*Carex brevior*), Common Ragweed, Prairie Thistle (*Cirsium undulatum*), Prairie Dandelion (*Agoseris glauca*), Groundplum Milkvetch (*Astragalus crassicarpus*), Yellow Sweetclover, Green Milkweed (*Asclepias viridiflora*). One rockpile exists approximately 50 m E of the center. **Edge:** Similar vegetation surrounds the area for at least 30 m on all sides. **Topography:** Rolling hills, varying from about 2200 to 2240 ft. **Coverage:** May 31; June 4, 10, 18-19, 26, mainly between 0600 to 0730. Total man-hours: 9. **Census:** Grasshopper Sparrow, 9 (89, 36); Bobolink, 8 (79, 32); W. Meadowlark, 3 (30, 12); Blue-winged Teal, 1. **Total:** 4 species; 21 territorial males ($208/\text{km}^2$, 84/100 acres). — DEBBIE A. JACOBSON, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

158. MIXED-SEEDED RANGE/CROP. — **Location:** North Dakota; Dunn Co., NW quarter of Sect 1, T144N, R94W, 1- $\frac{1}{2}$ mi. S, 3- $\frac{1}{2}$ mi. E Dunn Center. **Continuity:** New. **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** 12.5 acres of crop constitute the S half of the area of which 4 acres are corn and 8.5 acres wheat. The N 12.5 acres is range which was seeded approximately in the late 1930s; since then, it has been heavily grazed for many years. The range half is separated from the crop half by barbed-wire fence. The dominant range grasses and forbs are Crested Wheatgrass, Blue Grama, Silverleaf Scurfpea, and Cudweed Sagewort. Less prominent vegetation of the range includes Western Wheatgrass, Needle-and-Thread, Prairie Junegrass, Foxtail Grass (*Setaria glauca*), Green Needlegrass, Needleleaf Sedge, Red Threawn, Little Bluestem (*Andropogon scoparius*), Big Sandgrass, Fringed Sagewort, Purple Coneflower, Prairie Birdsfoot Trefoil, Pennycreas (*Thlaspi arvense*), Purple Loco, Wormwood, Blue Wild Lettuce, Hairy Goldaster, Milkvetch (*Astragalus striatus*), Soft Goldenrod, Pursh's Plantain, Skeleton Weed, Downy Painted Cup (*Castilleja sessiliflora*), Wild Licorice (*Glycyrrhiza lepidota*), Prairie Coneflower, Purple Prairieclover, Wild Prairie Rose, Stiff Sunflower (*Helianthus rigidus*), Pepperweed, Narrow-leaved Puccoon (*Lithospermum incisum*), Western Wallflower (*Erysimum arvense*). **Edge:** Bordered on all sides by similar range. The crop is bordered on the W side by a grassy hayfield and farm access lane, while all other sides are similar cropland. **Topography:** Rolling hills throughout varying from about 2200 to 2220 ft. **Coverage:** May 31; June 4, 10, 16, 21, 25; mainly between 0445 and 0840. Total man-hours: 8. **Census Census Range:** Chestnut-collared Longspur, 8 (158, 64); W. Meadowlark, 1. **Range Total:** 2 species, 9 territorial males ($178/\text{km}^2$, 72/100 acres). **Census Crop:** Lark Bunting, 3 (59, 24); Chestnut-collared Longspur, 3; Horned Lark, 1. **Crop Total:** 3 species, 7 territorial males ($138/\text{km}^2$, 56/100 acres). **Area Total** 4 species; 16 territorial males ($258/\text{km}^2$, 64/100 acres) — DEBBIE A. JACOBSON, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

159. MIXED-NATIVE RANGE/CROP (I). — **Location:** North Dakota; Dunn Co., NE quarter of Sect 32, T145N, R93W, 3 mi. E, $\frac{1}{2}$ mi. S Dunn Center. **Continuity:** New. **Size:** 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** Divided in half E and W by a barbed wire fence. The N half is native range; the S half consists of a 2.5 acre strip of hay and two 3.3 acre strips of wheat separated by 3.5 acres of corn. The dominant plants in the range are Blue Grama, Needleleaf Sedge, Big Sandgrass, Silverleaf Scurfpea, Pursh's Plantain, Wormwood, and Fringed Sagewort. Less prominent range plants are Prairie Junegrass, Threadleaved Sedge (*Carex filifolia*), Prairie Birdsfoot Trefoil, Cudweed Sagewort, Narrowleaved Blazing Star (*Liatris punctata*), Purple Prairieclover, Catsfoot (*Antennaria sp.*), Owl Clover, Purple Loco, Whitestemmed Eveningprimrose (*Oenothera nuttallii*), Hairy Goldaster, Moss Phlox (*Phlox hoodii*), False Lupine, Purple Coneflower, Prairie Coneflower, Early Goldenrod,

Milkvetch, White Prairieclover, Toothleafed Eveningprimrose (*Oenothera serrulata*), Four-o'clocks (*Mirabilis nyctaginea*), Creeping Juniper (*Juniperus horizontalis*), and Sandcherry (*Prunus pumila*). **Edge:** The N is partially bordered by a fence enclosing a haystack, and about 4 acres of oats; the E and W by a continuation of similar crop and the S by similar range. **Topography:** Gentle rolling hills; elevation approximately 2220 ft. **Coverage:** May 31; June 5, 11, 17, 21, 25, mainly from 0500 to 0750. Total man-hours: 7. **Census Range:** Horned Lark, 5 (99, 40); Chestnut-collared Longspur, 4 (79, 32); W. Meadowlark, 1; Lark Bunting, 1. Range Total: 4 species; 11 territorial males (217/km², 88/100 acres). **Census Crop:** Horned Lark, 1, Chestnut-collared Longspur, 1. Crop Total: 2 species; 2 territorial males (40/km², 16/100 acres). Brown-headed Cowbird, +. **Area Total:** 5 species; 13 territorial males (128/km², 52/100 acres). **Remarks:** 2 Chestnut-collared Longspur nests located. — MARTHA CARLISLE, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

160. MIXED-NATIVE RANGE/CROP (II). — **Location:** North Dakota; Dunn Co., NE quarter of Sect. 18, T144N, R94W, 3½ mi. S, ½ mi. W Dunn Center. **Continuity:** New. **Size:** 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** The N half of the plot consists of two 2-acre strips of wheat, separated by 8.5 acres of stubble which was plowed during the week of June 16. A barbed wire fence separates this crop half from the S half of the plot which is native range of good condition (approximately 60% of climax). The native range half is rolling terrain of predominantly N and E facing slopes. The dominant plants on N facing slopes are Needleleaf Sedge, Needle-and-Thread, and Silverleaf Scurfpea. Other plants found on the E facing slopes are Kentucky Bluegrass, Prairie Junegrass, Fringed Sagewort, and Cudweed Sagewort. **Edge** Range half bordered by similar range; crop half by similar crop. **Topography:** Rolling hills, varying from 2270 to 2290 ft. **Coverage:** June 6, 11, 16, 21, 23, 26-27; mainly between 0455 and 0700. Total man-hours 7. **Census Range:** Chestnut-collared Longspur, 13 (257, 104); Horned Lark, 3 (59, 24); W. Meadowlark, 1; Grasshopper Sparrow, 1. Range Total: 4 species; 18 territorial males (356/km², 144/100 acres). **Census Crop:** Horned Lark, 6 (119, 48); Lark Bunting, 2, Chestnut-collared Longspur, 2. Crop Total: 3 species; 10 territorial males (198/km², 80/100 acres). **Area Total:** 5 species; 28 territorial males (277/km², 112/100 acres). — LARRY D. VOORHEES, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

161. MIXED-NATIVE RANGE/CROP (III). — **Location:** North Dakota; Dunn Co., NW quarter of Sect 2, T144N, R93W, 1½ mi. S, 3 mi. E Dunn Center. **Continuity:** New. **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** Bisected by fenceline, this plot consists of cropland, and native grassland with a long history of grazing. Three 2-acre strips of corn planted during the week of June 13, separated by strips of oats presently make up the 12-½ acre cropland. Dominant grasses and forbs on the range are Canada Wildrye (*Elymus canadensis*),

Kentucky Bluegrass, Crested Wheatgrass, Yellow Sweetclover, Prairie Birdsfoot Trefoil, and Com Ragweed. Other widely scattered plants include Foxtail Barley, Smooth Brome (*Bromus inermis*), Slender Wheatgrass (*Agropyron trachycaulum*) Prairie Junegrass, Wild Oat (*Avena fatua*), Big Sandgrass, Sand Sunflower (*Helianthus petiolaris*), Western Yarrow, Pursh's Plaintain, Large Goatsbeard, Early Goldenrod, Willow-leaved Dock, Wild Prairie Rose, Wild Vetch, Daisy Fleabane, Blue Wild Lettuce, Prairie Coneflower, and Skeleton Weed. **Edge:** Similar crops and vegetation surround the crop and rangeland, respectively, for at least 30 m on all sides. **Topography:** Rolling hills, varying from about 2220 to 2240 ft. **Coverage:** June 13, 17, 23, 27; July 1; mainly between 0510 and 0710. Total man-hours: 6. **Census:** Range—Grasshopper Sparrow, 5 (98, 40); Lark Bunting, 3 (60, 24); W. Meadowlark, 2; Horned Lark, 1; Chestnut-collared Longspur, 1. Range Total: 5 species; 12 territorial males (237/km², 96/100 acres). Crop Total 3 species; 5 territorial males (99/km², 40/100 acres) Non-territorial breeders: Brown-headed Cowbird, average 1 female; Sharp-tailed Grouse, +. **Area Total:** 7 species; 18 territorial males or females (178/km², 72/100 acres). **Remarks:** One Horned Lark nest located. — DEBBIE A. JACOBSON, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102

162. CROPLAND (I). — **Location:** North Dakota, Dunn Co., SE quarter of Sect. 16, T144N, R94W, 4 mi. S, 1 mi. E Dunn Center. **Continuity:** New **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced) **Description of Plot:** Three strips of wheat, planted approximately during the week of June 1, two 4 acre, one 8 acre; divided by two strips of stubble. **Edge:** Similar crop surrounds the grid for at least 30 m on all sides, with the exception of moist meadow extending approximately 20 m along S edge. **Topography:** Gently rolling, with average elevation of 2260 ft. **Coverage:** June 6, 11, 16, 18, 21, 24; mainly between 0555 to 0720. Total man-hours: 4. **Census:** Horned Lark, 5 (49, 20); Chestnut-collared Longspur, 5; Lark Bunting, 2, Clay-colored Sparrow, 1. **Total:** 4 species; 13 territorial males (128/km², 52/100 acres). **Remarks:** Stubble cultivated between fifth and sixth trip to grid. — DEBBIE JACOBSON, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

163. CROPLAND (II). — **Location:** North Dakota, Dunn Co.; SW quarter of Sect. 21, T144N, R94W, 5 mi. S, ½ mi. E Dunn Center. **Continuity:** New **Size:** About 10.12 ha = 25 acres (square, 348 yards, paced) **Description of Plot:** Three strips of crop seeded during week of June 1; approximately 8.5 acres barley, 8 5 acres wheat, 2 acres oats with 6 acres summer fallow separating the barley and wheat. A grassy area (about ½ acre) occupies the SE corner of the grid. **Edge:** Similar crop surrounds grid for at least 30 m on all sides. **Topography:** Gently rolling, with average elevation of 2220 ft. **Coverage:** June 6, 11, 16, 18, 21, 24, mainly between 0500 to 0640. Total man-hours 4 **Census:** Horned Lark, 2; W. Meadowlark, 1. **Total:** 2 species; 3 territorial males (30/km², 12/100 acres) — DEBBIE JACOBSON, Zoology Dept., North Dakota State Univ., Fargo, N. D. 58102.

164. HAYLAND. — **Location:** North Dakota; Dunn Co., SW quarter of Sect. 5, T144N, R93W, 5.5 miles E, 2.5 miles S of Dunn Center. **Continuity:** New. **Size:** 10.12 ha = 25 acres (square, 348 yards, paced). **Description of Plot:** Four alternating, 6.2 acre grass and alfalfa strips. The dominant plants in the alfalfa strips are: Alfalfa (*Medicago sativa*) and Smooth Brome, and in the grass strips, Smooth Brome and Crested Wheatgrass. Less prominent plants on the area are Western Yarrow, Yellow Sweetclover, Foxtail Barley, Com. Sunflower (*Helianthus annuus*), Pepperweed, Large Goatsbeard, Pennycress, and Wild Prairie Rose. **Edge:** Bordered on all sides by similar hay strips. **Topography:** Gentle rolling, with average elevation of 2240 ft. **Coverage:** May 31; June 4, 10, 17, 19, 27; mainly from 0430 to 0800. Total man-hours: 8.5. **Census:** Bobolink, 13 (128, 52); Savannah Sparrow, 7 (69, 28); Chestnut-collared Longspur, 6 (59, 24); Grasshopper Sparrow, 5 (49, 20); Brown-headed Cowbird, 1 female. **Total:** 5 species; 32 territorial males or females (316/km², 128/100 acres). — MARTHA CARLISLE, Zool. Dept., North Dakota State Univ., Fargo, N. D. 58102.



Census 165. Residential street in Smithers, Hudson Bay Mountains in background. Photo/A.J. Erskine.

165. URBAN AREA, COMMERCIAL AND RESIDENTIAL. — **Location:** British Columbia, Smithers; bounded by 4th Ave., King St., laneway between Broadway & Alfred, Columbia St. (clockwise from N corner); 54°47'N, 127°10'W, map 93L/14E, Smithers, NTS. **Continuity:** New. **Size:** 27 ha = 66.7 acres (rectangular, 600 m NW-SE by 450 m NE-SW; mapped with measured rope). **Description of Plot:** Part of a small (population 4500) town, including main business district and most of older residential area; all streets and laneways except 4th Ave. show on 1:50,000 map surveyed in 1950, but probably one-quarter of all buildings are more recent than this. The business district takes in Main St., 4th Ave. for a block on either side of Main St., and perhaps one-half block on the other crossing avenues, in total one-third of the area. This area is almost treeless, and includes 2 hotels, 41 stores, 20 offices, one shopping centre, 8 service stations, car dealerships, or body shops, 7 warehouses and barns, a movie theatre, and 3 restaurants, besides at least 16 sizeable and many smaller parking areas adding up to one-quarter of the business district. The residential areas surveyed contain 131 single houses; two double homes, and three small apartment blocks (each 4-6 units). The laneways down the middle of each block are lined with garages (45) and utility sheds (67). There are three churches, three meeting halls, a funeral parlour, the curling club, and the high school, which consists of five interconnected buildings and with its lawns, occupies one-half a block. There are also four parking areas, and 10 vacant lots grown up to grass, weeds, or bushes. Excluding the vacant areas, private house lots make up 80% of the residential area. Trees 15 or more ft tall numbered 576, with spruces (*Picea spp.*) 35% Box-Elder (*Acer negundo*) 16%, willows (*Salix spp.*) 15%, Quaking Aspen (*Populus tremuloides*) 13%, and Black Cottonwood (*Populus trichocarpa*) 7%, the most frequent. The large trees, chiefly spruces and cottonwoods, ranged up to 50 ft in height, and were concen-

trated around a few intersections, most notably the N corner of the plot. **Edge:** Bordered by similar urban habitat on all sides, the nearest undeveloped area being about 300 m to the SE. The main highway passes one block to the NE, and the railway parallels the SW edge about two blocks away. **Topography:** Flat, the slope rising to Hudson Bay Mt. (8400 ft, 6 miles W of downtown) starts just beyond the railway yards. **Elevation:** 1625 ft. **Weather:** Generally cool, and often showery; most surveys had cloudy to overcast skies, with light drizzle for parts of 3 surveys; winds were light; temperatures during surveys ranged from -1° (30°F) to 16°C (61°F). **Coverage:** May 30; June 3, 6, 9, 13, 16, 22, 28; July 3, 9; between 0441 and 1210 hr, PDT. Total man-hours: 21. **Census:** Violet-green Swallow, 26 (96, 39); Pine Siskin, 24 (89, 36); Cliff Swallow, 22 (81, 33); House Sparrow, 10 (37, 15); Chipping Sparrow, 6.5 (24, 10); Starling, 6 (22, 9); Barn Swallow, 5.5 (20, 8); Tree Swallow, 3.5 (13, 5); Am Robin, 3.5; Yellow-rumped (Audubon's) Warbler, 2.5, Com. Crow, 0.5; Black-capped Chickadee, 0.5; Ruby-crowned Kinglet, 0.5; Rufous Hummingbird, +, White-crowned Sparrow, +. **Total:** 15 species; 111 territorial and non-territorial males (411/km², 166/100 acres). **Remarks:** Four nests of Starlings were found Young of Violet-green, Tree, and Cliff Swallows were seen. Species with territories extending into the commercial area were Barn and Cliff Swallows, Starling, and House Sparrow, but even these chiefly frequented the side streets and laneways; Main St. was almost birdless on all visits. Yellow-rumped Warblers and Ruby-crowned Kinglets frequented the tall spruces exclusively, whereas robins and Chipping Sparrows, which also frequented well-treed areas, used all ages and species of trees. The Pine Siskins were ubiquitous, foraging in trees, lawns, and weedy areas, picking grit on laneways and parking lots, and perched on overhead wires even in commercial areas; their presence in such numbers may not be typical, but no comparable data exist for other years. — ANTHONY J. ERSKINE, Migratory Bird Populations, Canadian Wildlife Service Ottawa, Canada K1A 0H3.