

Thirty-eighth Breeding Bird Census

Edited by Willet T. Van Velzen

Last year's unprecedented rise in the number of census reports, totaling 125, continued in epidemic proportions this year — to a startling 152! In 1972, the total was 99. This 50 per cent jump in returns in just two years reflects not only vastly increased concern for environmental science in the institutions of higher learning, but recognition of the value of our studies for environmental impact statements that now may be required for all kinds of proposed development sites.

Reports were received from 33 states and provinces, and the District of Columbia. Again, California led with a high of 21 plots, 3 more than last year. Maryland and Pennsylvania, with 10 each, tied for second place followed by British Columbia, Connecticut and Ontario with 9. Seventy-five new plots were established and West Virginia now has the distinction of having censused 100 different plots.

It is regrettable that the foreword this year must be brief. However the *very large number* of reports that were submitted *many weeks* beyond the deadline date put the editing work so far behind that it was necessary to send earlier received batches of manuscripts off before those received later were completely edited. This situation cannot be tolerated! The large number of reports being received already almost demands that we trim down on the number we are able to publish. Perhaps a good way to start is by rejecting those that are received late. It was also distressing to receive many poor photocopies of manuscripts. Cooperators must keep in mind that these manuscripts, after being edited in Oregon, Patuxent and New York, go directly to the printer and therefore must be perfectly clear and legible. As any other journal, we must insist upon receiving the original copy of the manuscript. Volume in itself demands that the *burden* of the work be upon you; it cannot fall upon the editors. Regardless of the considerable toil of field work, the job is not completed until the paper work is properly done.

This year, with rising costs and increased submissions, *American Birds* is more than ever hard-pressed from a budget point of view to publish every manuscript received, and some authors will note with regret that their "Remarks"

have been drastically pruned. Several fine tables were also lost to inflation. The only other printing economy has been in the deletion of all but the first set of density figures for similar pair totals, i.e. if Com. Yellowthroat is 6 (54, 22), all other 6-pair species in the same census will have the identical density, which will not be repeated. For the future, if the program continues to grow, we may be forced to consider other means of economizing. The censuses are of increasing environment science value, and are now being entered on into a computerized data bank at the Patuxent Wildlife Research Center, and we want to encourage, rather than discourage, their growth. But if the present growth continues, *American Birds* will be hard-pressed to accommodate it.

Do not think that all manuscripts were late and in poor condition. We extend our most sincere thanks to all those whose prompt submission and infinite care in preparation and typing made our task bearable and enjoyable.

Without the assistance of Aldeen Van Velzen you would still be *waiting* to see this issue.

Contributors and compilers are reminded again that there is a *deadline* for submission of these studies: the next one will be September 10, 1975. Original manuscripts, with photographs and other documents, should be mailed in time to reach Willet T. Van Velzen by that date. His address is Route 6, Box 493 A, Eugene, Oregon, 97402.

This Census is dedicated to Alberta biologist Loran L. Goulden, whose untimely death came even before his manuscripts were completed.

LIST OF CENSUSES

Eastern—Deciduous Forest

- | | |
|-------------------------------------|---------------|
| 1. Upland Beech-Oak
Forest | New Hampshire |
| 2. Second-growth Hardwood
Forest | Connecticut |

81	Disturbed Oak-Hickory Forest, Pine Stand, Edge and Pond	Ohio	121. Mature Douglas-fir Forest	California
82	Grassy Marsh-Deciduous Forest	Ohio	122. Ponderosa Pine Forest	Colorado
83	Mountain Top, Bog-Mixed Hardwood-Evergreen Edge	Pennsylvania	Western—Mixed Habitats	
84	Old Field-Meadow and Primary Deciduous Thickets	Pennsylvania	123. Scattered Mixed Coniferous Forest	Oregon
85	Overgrown Pasture	West Virginia	124. Coastal Sage Shrub	California
86	Cultivated Field and Abandoned Airport Landing Strip	North Carolina	125. Coastal Scrub	California
87	Grassland	North Carolina	126.-127. Disturbed Coastal Scrub (A-B)	California
88	Mixed Deciduous-Pine and Pastureland	Mississippi	128. Disturbed Foothill Grassland	California
Central—Prairie				
89	Northern Grassland	Wyoming	129. Joshua Tree-Blackbrush-Bladder Sage Association	California
90	Seeded Grassland	Wyoming	130. Mixed Oak-Digger Pine Woodland	California
91	Shortgrass Prairie	Colorado	131. Sagebrush Steppe	Wyoming
92	Kentucky Blue Grass Prairie	North Dakota	132. Desert Shrub	Utah
93-98.	Mixed Prairie (I-V, VII)	North Dakota	133. Cottonwood Riverbottom-Pasture	Colorado
99	Mixed Prairie Park	Nebraska	Northern—Deciduous	
100	Floodplain Tallgrass Prairie	Kansas	134. Balsam Poplar Bottomland	British Columbia
101	Sandhill Prairie	Kansas	135. Mature Aspen Stand	British Columbia
102	Virgin Tallgrass Prairie	Oklahoma	136. Willow-Alluvial Deposit	British Columbia
103	Restored Tallgrass Prairie	Wisconsin	Northern—Coniferous	
104	Maintained Invaded Grassland	Indiana	137. Black Spruce Stand on Mountainside	British Columbia
Central—Mixed Habitat				
105	Mixed Habitat-Disturbed Bottomland	Oklahoma	138. Bottomland White Spruce Forest	British Columbia
106	Floodplain Pond	Colorado	139. Stunted Black Spruce on Raised Bog	British Columbia
Western—Deciduous				
107	Disturbed Floodplain Woodland	California	140. Upland Lichen Woodland	Northwest Territories
108	Oak-California Bay-Buckeye-Mixed Forest	California	Northern—Mixed	
109	Riparian Woodland	California	141. Abandoned Tract	British Columbia
110	Sycamore-Coast Live Oak-Riparian Woodland	California	142. Mature Poplar-Spruce Island	British Columbia
111	Sycamore-Coast Live Oak-Riparian Woodland	California	Wetlands	
112 -113.	Floodplain Cottonwood Forest	Colorado	143. Salicornia Salt Marsh	California
Western—Coniferous-Deciduous (Mixed)				
114	California Bay-Bishop Pine-Mixed Forest	California	144. Shrubby Swamp	Michigan
115	Ponderosa Pine-Scrub Oak-Mountain-mahogany Woodland	Colorado	145. Sedge-Rush Swale	Ontario
Western—Coniferous				
116 -118.	Bishop Pine Forest	California	146. Shrubby Swamp and Sedge Hummocks	Connecticut
119	Disturbed Bishop Pine Forest	California	Fields and Cultivated Areas	
120	Logged Douglas-fir-Re-seeded with Monterey Pine	California	147. Blue Grass-Milkweed Grassland	Ontario
			148. Partially Abandoned Hayfields and Pastures	Connecticut
			149. Old Field	Pennsylvania
			150. Abandoned Field	Maryland
Urban Habitats				
			151. Small Town Residential Area	British Columbia
			152. Urban, Residential	California

1. UPLAND BEECH – OAK FOREST. — **Location:** New Hampshire; 3 miles N of New Durham, eastern border of plot begins approximately 1/8 mile NW of Chalk Pond; 43°15'N, 71°00'W, Alton Quadrangle, USGS. **Continuity:** New. **Size:** 13.3 ha = 33 acres (compass and steel tape). **Description of Plot:** The dominant canopy tree is Am. Beech (*Fagus grandifolia*). The ground cover consists primarily of Wintergreen (*Gaultheria procumbens*) and various mosses. A quantitative survey of the vegetation, based on eight circular samples, gave the following results: Trees 3-inches dbh and over, 537/acre, total basal area 113.3 ft²/acre. Species comprising 90% of the total number of trees: Am. Beech 54%; Red Oak (*Quercus rubra*) 17%; Red Maple (*Acer rubrum*) 11%; White Pine (*Pinus strobus*) 6%; White Birch (*Betula papyrifera*) 3%; dead trees accounted for 4% of the total; Am. Beech was the only tree that appeared in each sample. Trees by diameter size class (figures after each size class give number of trees/acre, relative density (%), basal area ft²/acre, relative dominance (%)): A (3-6 in.) 329, 61, 32.9, 22; B (6-9) 135, 25, 40.6, 28; C (9-15) 57, 11, 45.8, 31; D (15-21) 16, 3, 28.1, 19. Shrub stems/acre 11,750; ground cover 25%; canopy cover 84%; average canopy height 50 ft (range 45-57 ft). **Edge:** Bounded on all sides by similar forest, but interspersed with small Hemlock (*Tsuga canadensis*) stands along the southern boundary. **Topography:** A hillside tract with southern exposure; a downward gradient of approximately 200 ft from NNE to SSW. **Elevation:** 900 ft along southern border. **Coverage:** May 6, 13, 21, 30; June 3, 5-6, 12-13, 18, 22, 26; July 3, 9, 11. All surveys between 0530 and 1030. Total 23.5 hours with an additional 39.5 hours in the grid layout, mapping, and plant survey. **Census:** (territorial males followed in parentheses by males per sq km and males per 100 acres) Black-capped Chickadee, 4.5 (34, 14); Veery, 4.5; Red-eyed Vireo, 4 (30, 12); Wood Thrush, 3.5 (26, 11); Solitary Vireo, 3.5; Ovenbird, 3.5; E. Wood Pewee, 3 (22, 9); Scarlet Tanager, 2.5; Black-throated Blue Warbler, 2; Yellow-bellied Sapsucker, 2; Am. Robin, 2; Black-and-white Warbler, 2; Rufous-sided Towhee, 1.5; Least Flycatcher, 1; White-breasted Nuthatch, 1. **Total:** 15 species; 41 territorial males (307/km², 124 per 100 acres). **Remarks:** Neither nests nor recently fledged young were found during the survey period. — KEN HUNTER, *Chalk Pond, New Durham, N.H. 03855.*

2. 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; 8 intermittent years. **Size:** 25 acres (roughly rectangular). **Description of Plot:** See AFN 19: 590-591, 1965. **Coverage:** June 5, 7, 9, 15, 18-19, 22, 26. Hours varied from 0445 to 2300 and totaled about 20. **Census:** Red-eyed Vireo, 7 (69, 28); Ovenbird, 7; Veery, 6 (59, 24); Chestnut-sided Warbler, 6; Com. Yellowthroat, 6; Am. Redstart, 6; Rufous-sided Towhee, 5 (49, 20); Black-capped Chickadee, 3 (30, 12); Gray Catbird, 2.5; Hairy Woodpecker, 2; White-breasted Nuthatch, 2; Brown Creeper, 2; House Wren, 2; Am. Robin, 2; Wood Thrush, 2; Black-and-white Warbler, 2; Brown-headed Cowbird, 2; Song Sparrow, 2; Blue-winged Warbler, 1; Ruffed Grouse, 1; Com. Flicker, 1; Downy Wood-

pecker, 1; Yellow-bellied Sapsucker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; Tufted Titmouse, 1; "Lawrence's" Warbler x Blue-winged Warbler, 1; La. Waterthrush, 1; Canada Warbler, 1; N Oriole, 1; Scarlet Tanager, 1; Cedar Waxwing, 0.5; Am Goldfinch, 0.5; Broad-winged Hawk, +; Com. Crow, +; Com. Grackle, +; Hermit Thrush, +; Yellow-throated Vireo, +. **Total:** 38 species; 81 territorial males (801/km², 324 per 100 acres). **Remarks:** Change was not of measurable significance. The Yellow-bellied Sapsucker, locally at the edge of its range, was new — ANDREW MAGEE, *34 Hobson St., Springfield, Mass. 01109*, sponsored by the Litchfield Hills Audubon Society, Litchfield, Conn.

3. SUBURBAN WILDLIFE SANCTUARY-MIXED HABITAT—**Location:** Connecticut; Fairfield Co., Nature Center at Westport (formerly Mid-Fairfield County Youth Museum), Westport; 41°8'N, 73°22'W, Norwalk North, Conn.-N.Y. Quadrangle, USGS. **Continuity:** Established 1971; 4 consecutive years. **Size:** 20.2 ha = 50 acres (boundary very irregular) **Description of Plot:** See AB 25:1010-1011, 1971 **Coverage:** May 28, 30-31; June 1, 5, 8, 10, 12, 15, 25, July 2, 6. All trips between 0700 and 1100. Total man-hours: 18. **Census:** House Wren, 13 (64, 26); Gray Catbird, 6 (30, 12); Rufous-sided Towhee, 5 (25, 10); Blue Jay, 4 (20, 8); Red-winged Blackbird, 4; Song Sparrow, 4; Great Crested Flycatcher, 3 (15, 6); Brown Thrasher, 3; Am. Robin, 3; Starling, 3; Blue-winged Warbler, 3; Brown-headed Ctwbird, 3; Com. Flicker, 2; Tree Swallow, 2; Tufted Titmouse, 2; House Sparrow, 2; N Oriole, 2; Cardinal, 2; Field Sparrow, 2; Ring-necked Pheasant, 1; Mourning Dove, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Rose-breasted Grosbeak, 1; House Finch, 1. **Total:** 30 species; 79 territorial males (390/km², 158 per 100 acres). **Remarks:** Nests located: 13 House Wren, 3 Starling, 2 Tree Swallow, 2 House Sparrow, 1 Com. Flicker, 1 Downy Woodpecker and 1 Gray Catbird. The same number of species was recorded this year as the last two but there were changes. Missing this year but present in 1973 were Wood Duck, Wood Thrush, and Veery. The White-breasted Nuthatch was present again, the House Finch was recorded as a new nesting species and Brown-headed Cowbirds were found to have successfully parasitized three nests on the plot — (Cardinal, towhee, and Song Sparrow). The numbers of territorial males showed the second consecutive slight increase, from 69 in 1972 to 74 in 1973 to this year's 79. The disappearance of both the Wood Thrush (1 in 1973) and Veery (3 in 1973) was surprising. Birds of both species were heard singing only occasionally, most outside the sanctuary. In total, 9 species increased by one or two pairs, 10 decreased by the same number, and 11 remained the same. — ROBERT C. DEWIRE, *The Nature Center at Westport, Westport, Conn. 06880.*

4. UPLAND OAK-MAPLE FOREST. — **Location:** Connecticut, Tolland Co., 1.7 mi. ESE Union, western slope of Coyle Hill; Westford Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (rectangular, 400 x 250 m, measured with compass and tape)



Census 4. Western slope of Coye Hill in Yale Forest.

Description of Plot: See AB 28:697-8, 1974. **Weather:** See Census 52. **Coverage:** May 13, 16, 21-22, 26, 28; June 3, 6, 9, 12, 15, 18-20, 24, 30; July 4, 8, 14. All trips between 0500 and 1930 hours, vast majority between 0500 and 0800. Total man-hours: 32. **Census:** Ovenbird, 18 (180, 73); Red-eyed Vireo, 16.5 (165, 67); Rufous-sided Towhee, 6 (60, 24); E. Wood Pewee, 4 (40, 16); Veery, 4; Scarlet Tanager, 4; Black-and-white Warbler, 3.5 (35, 14); Black-throated Blue Warbler, 3.5; Am. Robin, 3 (30, 12); Black-throated Green Warbler, 2.5; Black-capped Chickadee, 2; Brown Creeper, 2; Brown-headed Cowbird, 2; Hairy Woodpecker, 1.5; Downy Woodpecker, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Hermit Thrush, 1; Solitary Vireo, 1; Blackburnian Warbler, 1; Rose-breasted Grosbeak, 1; Dark-eyed Junco, 1; Pileated Woodpecker, +. **Total:** 24 species; 81.5 territorial males ($815/\text{km}^2$, 330 per 100 acres). **Remarks:** Gypsy Moth defoliation quite noticeable during the last week of June but did not appear to affect the formation or continuance of territories. The partial defoliation, confined to the canopy oaks, may have affected the post breeding foraging of adults or the care of fledglings. Nests found: Hairy Woodpecker, 1; Downy Woodpecker, 1; Scarlet Tanager, 1; Ovenbird, 1; Solitary Vireo, 1; Red-eyed Vireo, 1. Mammals seen include White-tailed Deer, Porcupine, E. Gray Squirrel, and E. Chipmunk. I thank David Smith and the Yale University School of Forestry and Environmental Studies for permission to conduct the study in Yale Forest. — JOSEPH L. SUCHECKI, Biological Sciences Group, Univ. of Conn., Storrs, Conn., 06268.

5. LOWLAND OAK-BEECH-MAPLE FOREST. — **Location:** New York; Oswego Co., 2 miles south of Oswego, $43^{\circ}25' \text{W}$, $76^{\circ}30' \text{N}$, Oswego East Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangular, paced longitudinally and estimated laterally). **Description of Plot:** Forest crown closed with sparse (30%) understory of shrubs averaging 1 m in height; an 80% herbaceous ground cover; typical moist deciduous woodland; trees average 16 m in height and stems average 7 m apart. The canopy trees followed by relative density and dbh in cm were: Red Oak (*Quercus rubra*) 25%, 36; Sugar Maple (*Acer saccharum*) 25%, 38; Red Maple (*A. rubrum*) 1%, 36; Am. Beech (*Fagus grandifolia*) 14%, 25; White Ash (*Fraxinus americana*) 9%, 23; Yellow Birch (*Betula lutea*) 6%, 18; with Hemlock (*Tsuga canadensis*), Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*) and Ironwood (*Carpinus caroliniana*) making up the remaining 7%. **Edge:** Bounded by similar forest except 300 m bounded by field. **Topography:** Flat, elevation 300 ft. **Coverage:** May 30; June 6, 9, 11, 13, 18, 20, 23, 25; July 5. Hours were from 0530 to 1030 and totaled 20 party hours. **Census:** Red-eyed Vireo, 10 (124, 50); Veery, 8 (99, 40); Com. Yellowthroat, 8; E. Wood Pewee, 7 (86, 35); Wood Thrush, 7; Song Sparrow, 6 (74, 30); N. Oriole, 5 (62, 25); House Wren, 4 (49, 20); Am. Redstart, 4; Ovenbird, 3 (37, 15); N. Waterthrush, 3; Rose-breasted Grosbeak, 3; Blue Jay, 2; Am. Robin, 2; Downy Woodpecker, 1; Great Crested Flycatcher, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Winter Wren, 1; Gray Catbird, 1; Cedar Waxwing, 1; Red-winged Blackbird, 1; Com. Grackle, 1; Scarlet Tanager, 1; Field Sparrow, 1; Great Horned Owl, +; Com. Flicker, +; Hairy Woodpecker, +; Rufous-sided Towhee, +. **Total:** 30 species; 88 territorial males ($1087/\text{km}^2$, 440 per 100 acres). **Remarks:** Conducted as an ornithology class project by the following: David Beecher, Doris Blaise, Cheryl Gundersen, Jane Kidney, Claudia King, Paul Lawrence, Dorothy Mott, Jean Nocilly, Steven Pfleegor, and Carol Wernick. This plot is part of 100+ acres of similar woodland located near a rapidly developing area. A narrow dirt road has made the area accessible to man. The wet land and abundant biting insects will probably delay future development. I wish to thank the owner, Eben Poland for his permission to use the land for educational purposes and the class for their effort and dedication which made this census possible. — GEORGE R. MAXWELL, Rice Creek Biological Field Station, Dept. of Zoology, State University College, N.Y. 13126.

6. MIXED UPLAND FOREST. — **Location:** New York; Ulster Co., 1 mile SE of Mohonk Lake; $41^{\circ}46' \text{N}$, $74^{\circ}09' \text{W}$, Mohonk Lake Quadrangle, USGS. **Continuity:** New. **Size:** 6.08 ha = 15 acres (rectangular, compass and pacing). **Description of Plot:** The dominant canopy trees are White Ash (*Fraxinus americana*), Sugar Maple (*Acer saccharum*) and E. Hemlock (*Tsuga canadensis*). Most abundant understory growth (less than 3 in. dbh): White Ash, Sugar Maple, Witch Hazel (*Hamamelis virginiana*) and Spicebush (*Lindera benzoin*). Typical ground cover is Virginia Creeper (*Parthenocissus quinquefolia*), Sensitive Fern (*Onoclea sensibilis*) and seedling White Ash. A quantitative survey of the vegetation gave the following

results: Trees 3 inches diameter and over, based on 6 1/10th acre circular samples, 203/acre; total basal area 114 ft²/acre. Species comprising 90% of the total number of trees: Dead trees (mainly Am. Elm, *Ulmus americana*) 42, 20, 21, 50; White Ash, 37, 18, 8, 67; Sugar Maple, 30, 15, 15, 100; E. Hemlock, 26, 13, 14, 17; Basswood (*Tilia americana*), 13, 6, 12, 33; Striped Maple (*A. pensylvanicum*), 13, 6, 1, 17; Slippery Elm (*U. rubra*), 10, 5, 3, 33; Chestnut Oak (*Quercus prinus*), 5, 2, 10, 17; Red Maple (*A. rubrum*), 5, 2, -, 33; Red Oak (*Q. rubra*), 5, 2, 3, 50. Trees by diameter size class: A (3-6 in.) 96, 47, 10, 8.7; B (6-9 in.) 34, 17, 10.5, 9.2; C (9-15 in.) 50, 24, 41.5, 36; D (15-21 in.) 21, 10, 39, 34; E (21-27 in.) 2, 1, 5.2, 4.5; F (27-33 in.) 2, 1, 8.2, 7.2. Shrub stems/acre 1750; ground cover 48.5%; canopy cover 78%; average canopy height 60 ft (range 40-70 ft). **Edge:** Bordered on all sides by similar forest to depth of at least 100 yds. **Topography:** Gently rising (620-720 ft) mountain stream watershed. **Coverage:** May 11-13, 17-19, 23; June 1, 9, 15-16, 30; July 6, 9. Trips usually between 0500 and 0800 hours and occasionally at dusk. Total man-hours: 45. **Census:** Wood Thrush, 9 (148, 60); N Oriole, 4 (66, 27); Red-eyed Vireo, 3.5 (58, 23); Blue Jay, 3 (49, 20); Am. Redstart, 3; Rufous-sided Towhee, 3; Com. Flicker, 2.5; E. Wood Pewee, 2.5; Gray Catbird, 2.5; Am. Robin, 2.5; Scarlet Tanager, 2; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Black-and-white Warbler, 2; Ovenbird, 2; Com. Yellowthroat, 2; Tufted Titmouse, 1.5; Worm-eating Warbler, 1.5; E. Phoebe, 1; Black-capped Chickadee, 1; Yellow-throated Vireo, 1; Blue-winged Warbler, 1; N. Waterthrush, 1; Yellow Warbler, +; Red-winged Blackbird, +; Rose-breasted Grosbeak, +; Brown-headed Cowbird, +. **Total:** 27 species; 56 territories (923 /km², 373 per 100 acres). **Remarks:** Eight nests were located: 3 Wood Thrush and 1 each of Com. Flicker, Downy Woodpecker, Blue Jay, robin, Red-eyed Vireo. — JIM STAPLETON, Mohonk Trust, Mohonk Lake, New Paltz, N.Y., 12561.

7. UPLAND OAK FOREST.—Location: New York; Delaware Co. about 1.5 miles N of Pine Lake on South Hill about 2 miles E of West Davenport; 42°28'33"N, 74°56'15"W, West Davenport Quadrangle, USGS. **Continuity:** Established 1971 (1972), 3 intermittent years. **Size:** 11.8 ha = 29.1 acres (nearly square, essentially 6x5 units of 208 ft edge — i.e., measured into a grid of one acre units, measured with steel tape). **Description of Plot:** See AB 26: 661-662, 1972, and 26: 941, 1972. **Weather:** See Census 65. **Coverage:** June 11, 14, 18, 20-23, 26-27, 30; July 2, 4-6, 8-9, 16, 19-20, 22. Hours ranged from dawn to 1100 and totaled 29 man-hours. Four trips were also made in April (4, 13, 18, 20) and two in May (2, 16). **Census:** Ovenbird, 18 (153, 62); E. Wood Pewee, 12 (102, 41); Red-eyed Vireo, 9 (76, 31); Hermit Thrush, 8.5 (72, 29); Scarlet Tanager, 5 (42, 17); Black-capped Chickadee, 3 (25, 10); White-breasted Nuthatch, 3; Brown Creeper, 3; Great Crested Flycatcher, 2; Brown-headed Cowbird, 2 (females); Dark-eyed Junco, 2; Com. Flicker, 1; Hairy Woodpecker, 1.5; Blue Jay, 1; Rose-breasted Grosbeak, 1. **Total:** 14 species; 72 territorial males or females (611/km², 247 per 100 acres). **Remarks:** Appreciable reductions were observed for E. Wood Pewee 16 (1972) to 12, Red-eyed Vireo 13.5 (1972) to 9, Downy Wood-

pecker 2 (1972) to 0 and Yellow-rumped Warbler 6 (1972) to 0. Total density was reduced from (739/km², 299 per 100 acres) in 1972 to (611/km², 247 per 100 acres). —J. ROBERT MILLER and LOUIS C. FARLEY III, Hartwick College, Oneonta, N.Y. 13820

8. BIRCH-MAPLE-OAK FOREST. — Location: Pennsylvania; Butler Co., Buffalo Township, 1 mile S of intersection of State Route 228 and Kepple Road on Todd Sanctuary (owned by Audubon Society of Western Pennsylvania); 40°44'N, 79°42'W, USGS Freeport Quadrangle. **Continuity:** New. **Size:** 9 ha = 22.24 acres (square, measured and gridded with line and compass) **Description of Plot:** The dominant canopy trees are Black Birch (*Betula lenta*), Red Maple (*Acer rubrum*), and Red and White Oaks (*Quercus rubra*, *Q. alba*). Nineteen species of shrubs are recorded. A major portion of the shrub layer is composed of species in the arboreal layer. Virginia Creeper (*Parthenocissus quinquefolia*) is in all five circles. Maple-leaved Viburnum (*Viburnum acerifolium*) and Poison Ivy (*Rhus radicans*) are in four circles. Juneberry (*Amelanchier arborea*), Witch-Hazel (*Hamamelis virginiana*), and bramble (*Rhus spp.*) are in three circles. Fifty-six herbaceous species are noted in the five circles. This layer presents a complex pattern which varies according to minor variations in topography and moisture. Violets (*Viola spp.*), Sweet-scented Bedstraw (*Galium triflorum*), Wood-Fern (*Dryopteris spinulosa*), Partridge-berry (*Mitchella repens*) are in all five circles. A quantitative survey of the vegetation follows (Trees 3 inches dbh and over, based on five circular samples), 230 trees/acre, total basal area 166.4 ft²/acre. Species comprising 90% of the total number of trees: Red Maple, 54, 23.4, 27.5, 100; Black Birch, 52, 22.6, 10.2, 100; Black Cherry (*Prunus serotina*), 18, 7.8, 3.2, 100, White Oak, 18, 7.8, 23.3, 60; E. Hemlock (*Tsuga canadensis*), 20, 8.6, 2.2, 80; Red Oak, 16, 6.9, 6.6, 100, Dead Snags, 16, 6.9, 5.1, 100; Black Oak (*Q. velutina*), 10, 4.3, 14.5, 60; Hop-Hornbeam (*Ostrya virginiana*), 10, 4.3, 1.9, 20. Trees by diameter size class: A (3-6 in.) 94, 40.8, 9.4, 5.6; B (6-9 in.) 26, 11.3, 7.8, 4.6; C (9-15 in.) 68, 29.5, 54.4, 32.7; D (15-21 in.) 30, 13, 54, 32.4; E (21-27 in.) 10, 4.3, 31, 18.6; F (27-33 in.) 2, .8, 9.8, 5.9 Shrub stems/acre: 31,700; ground cover 64.7%; canopy cover 84.9%; average canopy height 19.3 m (range 15-25 m); subcanopy cover 51.2%; subcanopy height 8.5 m (range 5.4-12.0 m). **Edge:** Bordered on W by small strip of similar habitat and road and fields; N, E, S sides by similar habitat. **Topography:** A ridge runs into the plot from the north with a 20 to 40 ft drop on either side to streams. The streams flow through the plot and converge just to the south. **Elevation:** 960-1000 ft. **Weather:** Cool with occasional rain. **Coverage:** May 25, 30; June 4, 8, 12, 17, 20, 25. All censuses between 0500 and 0800 with additional information collected during the remainder of the day. Total man-hours: 24. **Census:** Red-eyed Vireo, 8.5 (94, 38); Cardinal, 7 (78, 32); Acadian Flycatcher, 5.5 (61, 25); Scarlet Tanager, 4 (44, 18), Tufted Titmouse, 3.5 (39, 16); Wood Thrush, 3.5, Ruffed Grouse, 3 (33, 13); E. Wood Pewee, 3; Blue-gray Gnatcatcher, 3; Brown-headed Cowbird, 3; Cerulean Warbler, 2.5; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Louisiana Waterthrush, 2; Kentucky Warbler, 2; Hooded Warbler, 2; Great Crested Fly-

catcher, 1.5; Yellow-billed Cuckoo, 1; Screech Owl, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Black-capped Chickadee, 1; Carolina Wren, 1, Am. Robin, 1; Rufous-sided Towhee, 1; Song Sparrow, 1; Broad-winged Hawk, +; Mourning Dove, +; Blue Jay, +; Com. Crow, +. **Total:** 33 species; 70 territorial males or females ($778/\text{km}^2$, 315 per 100 acres). **Remarks:** Nests found: Ruffed Grouse (2), Acadian Flycatcher (2), Broad-winged Hawk, E. Phoebe, Black-capped Chickadee, Carolina Wren and Wood Thrush. I thank Frank Bell and Brian Donahue for help with various parts of the study, and Paul Wiegman for doing the vegetation analysis, helping measure and grid the study area, and reading the manuscript. We used the method described by James and Shugart for the habitat description. — G. THOMAS BANCROFT, RD#3 Cedar Run Road, Allison Park, Pa. 15101.

9. 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 Peach Bottom Atomic Plant (York Co.); $39^\circ 46' 26''\text{N}$, $76^\circ 14' 24''\text{W}$, Quarryville Quadrangle, USGS. **Continuity:** New. **Size:** 8.1 ha = 20 acres (836 ft by 1045 ft, tape measure and compass). **Description of Plot:** The dominant canopy trees are Sweet Birch (*Betula lenta*), Tulip-tree (*Liriodendron tulipifera*), Chestnut Oak (*Quercus prinus*), and Red Maple (*Acer rubrum*). Most prominent in the understory are Spicebush (*Lindera benzoin*), Mountain-laurel (*Kalmia latifolia*), and Wild Hydrangea (*Hydrangea arborescens*). The ground cover is primarily Japanese Honeysuckle (*Lonicera japonica*), May-apple (*Podophyllum peltatum*), and Hay-scented Fern (*Dennstaedtia punctilobula*). A quantitative survey of the vegetation gave the following results: Trees, 3 inches in diameter and over, based on twenty 0.1-acre circular samples; 170/acre; total basal area 73 ft²/acre. Species comprising 90% of the total number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): Red Maple, 27.5, 16.2, 7, 1, 65; Tulip-tree, 23.5, 13.8, 23.7, 65; Sweet Birch, 16.5, 9.7, 27.4, 55; Dead trees, 14, 8.2, 4.9, 75; Chestnut Oak, 12, 7.1, 8.8, 30; Black Cherry (*Prunus serotina*), 11, 6.5, 4.2, 40; Tree-of-heaven (*Ailanthus altissima*), 8.5, 5, 3.6, 25; Red Oak (*Q. rubra*), 8.5, 5, 3.3, 40; White Ash (*Fraxinus americana*), 8.5, 5, 2.8, 40; Black Locust (*Robinia pseudoacacia*), 7.5, 4.4, 3.1, 30; Flowering Dogwood (*Cornus florida*), 5, 2.9, 0.8, 25; Redbud (*Cercis canadensis*), 5, 2.9, 0.8, 10; Black Oak (*Q. velutina*), 4, 2.4, 1.3, 25. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (3-6 in.) 96.0, 56.5, 9.6, 13.2; B (6-9 in.) 30.5, 17.9, 9.2, 12.5; C (9-15 in.) 31.5, 18.5, 25.2, 34.5; D (15-21 in.) 8.5, 5, 15.3, 21; E (21-27 in.) 2.5, 1.5, 7.8, 10.6; F (27-33 in.) 0.5, 0.3, 2.5, 3.4; G (33-40 in.) 0.5, 0.3, 3.6, 4.9. Shrub stems/acre 1595; ground cover 61%; canopy cover 78.5%; average canopy height 79 ft (range 55-110). A 10-ft wide gravel road winds diagonally from the NE to SW corner. Selective logging operations have been conducted intermittently for a number of years,

most recently in 1972. Overgrown logging trails exist throughout. In early May 1974 a low burning fire removed about three-fourths of an acre of the ground cover and understory from the western edge. **Edge:** Surrounded on all sides by similar habitat. Slate mounds from past mining operations alter the natural terrain on the southern border. **Topography:** SE and NW facing slopes of as much as 45°, with the gravel road as the centerline. **Elevation:** 180-400 ft. **Weather:** Clear to overcast and foggy, mild temperatures throughout most of census with high temperatures mostly in the 90s from late June through the end of the period. **Coverage:** April 11, 19, 26; May 6, 10, 16-17, 24, 31; June 7, 14, 18, 21; July 2, 13. All trips between 0500 and 0900 hours EDT, average length of trip 2 hr., 40 min. Total man-hours: 75. **Census:** Red-eyed Vireo, 8 (99, 40); Cardinal 8; Tufted Titmouse, 7 (86, 35), Carolina Wren, 7; Indigo Bunting, 7; Rufous-sided Towhee, 7; Black-capped Chickadee, 4 (49, 20), Mourning Dove, 3 (37, 15); Wood Thrush, 3; Yellow-billed Cuckoo, 2; Red-bellied Woodpecker, 2; Downy Woodpecker, 2; Acadian Flycatcher, 2; E. Wood Pewee, 2; Worm-eating Warbler, 2; Brown-headed Cowbird, 2 (females); Scarlet Tanager, 2; Kentucky Warbler, 1.5; Bobwhite, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Least Flycatcher, 1; Com. Crow, 1; Carolina Chickadee, 1; Gray Catbird, 1; Blue-gray Gnatcatcher, 1; White-eyed Vireo, 1; Cerulean Warbler, 1; Am. Goldfinch, 1; E. Phoebe, 0.5 **Total:** 32 species; 85 territorial males or females ($1050/\text{km}^2$, 425 per 100 acres). **Remarks:** 12 nests were located: Mourning Dove, 3; Tufted Titmouse, 2, Carolina Wren, 2; E. Phoebe, 1; Acadian Flycatcher, 1, Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1. One pair of Scarlet Tanagers was seen feeding 2 fledgling cowbirds; a second pair was seen feeding 1 fledgling tanager and 1 fledgling cowbird. The Bob-white territory listed represents two partial territories Additional species being studied are the Raccoon, Opossum, Woodchuck, Gray Squirrel, E. Cottontail, White-tailed Deer, White-footed Mouse, Short-tailed Shrew, E. Box Turtle, Black Rat Snake, N. Copperhead and Am. Toad. This is part of a continuing study to investigate and monitor the environmental conditions in the vicinity of the proposed Fulton Generating Station. Steven E. Allison and E. Terry Euston assisted on several visits. Special thanks to Jeffrey Dietz for supplying the quantitative habitat description. — THOMAS ALCOZE and ROBERT M SCHUTSKY, Ichthyological Associates, Inc., P.O. Box 12, Drumore, PA. 17518.

10. 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, $40^\circ 07' 34''\text{N}$, $79^\circ 10' 50''\text{W}$, Ligonier Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 330' x 1980' measured). **Description of Plot:** Trees, 3 inch diameter and over (dead and alive), based on six 0.1 acre circular samples: 434/acre; total basal area 185.5 ft²/acre. Species comprising 98% of the total number of trees: Red Maple (*Acer rubrum*) 152, 35, 30, 100; Red Oak (*Quercus rubra*), 115, 27, 47, 100; Dead

trees 107, 25, 10, 100; Black Cherry (*Prunus serotina*), 28, 7, 10, 100; Black Birch (*Betula lenta*), 8, 2, 1, 33; Cucumber Magnolia (*Magnolia acuminata*), 7, 2, 2, 33. Trees (dead and alive) by diameter size class: A (3-6 in.) 192, 44, 19.2, 10; B (6-9 in.) 95, 22, 28.5, 15; C (9-15 in.) 128, 30, 102.7, 55; D (15-21 in.) 17, 4, 30, 16; E (21-27 in.) 2, -, 5.2, 3. Ground cover — 73% (primarily ferns, with occasional Witch Hazel (*Hamamelis virginiana*), Striped Maple (*A. pensylvanicum*), very few tree seedlings. Shrub layer very sparse. Canopy cover 79%. Average canopy height 51 ft (range 50-55 ft). Edge: Surrounded on all sides by similar vegetation. Topography: Flat. Elevation: 2740 ft. Weather: Warm and clear for 8 days, heavy rain 1 day. Coverage: June 8-16. Hours: 0500 to 0930, 1200 to 1300, and 1700 to 1930. Total party-hours: 18.8. Census: Red-eyed Vireo, 5 (82, 33); Ovenbird, 3 (49, 20); Scarlet Tanager, 2; Rufous-sided Towhee, 2; Dark-eyed Junco, 2; E. Wood Pewee, 1; Black-throated Green Warbler, 1; Rose-breasted Grosbeak, 1; Brown Creeper, 0.5; Veery, 0.5; Solitary Vireo, 0.5; Red-shouldered Hawk, +; Barred Owl, +; Com. Flicker, +; Hairy Woodpecker, +; Downy Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +. Total: 19 species; 18.5 territorial males ($305/\text{km}^2$, 123 per 100 acres). Vegetation analysis is courtesy of Mrs. John R. Thorne. The cooperation and assistance of Glen Phillips and the Brooks Bird Club is gratefully acknowledged. — R. CARRELL ABBOTT, 8468 Peebles School Road, Pittsburgh, Pa. 15237.

11. SECOND GROWTH HARDWOOD FOREST. — Location: Pennsylvania, Perry Co., in Florence Jones Reineman Sanctuary about 10 miles N of Carlisle; $40^\circ 17' \text{N}$, $77^\circ 17' 30'' \text{W}$, Landisburg Quadrangle, USGS. Continuity: Established 1972; 2 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: Clear to partly cloudy, little rain during census period. Temperature during census trips 50-65° F. Coverage: May 31; June 2-3, 6, 8, 13-15, 18 (two trips), 22. Ten trips between 0530 and 0850 and one between 1615 and 1825 hours, EDT. Total man-hours: 60. Census: Red-eyed Vireo, 13 (41, 17); Yellow-billed Cuckoo, 4 (13, 5); Downy Woodpecker, 4; Great Crested Flycatcher, 4; Acadian Flycatcher, 4; Indigo Bunting, 4; E. Wood Pewee, 3 (10, 4); Black-capped Chickadee, 3; Tufted Titmouse, 3; Cardinal, 3; Blue-gray Gnatcatcher, 2; Louisiana Waterthrush 2; Scarlet Tanager, 2; Turkey, 1; Com. Flicker, 1; Pileated Woodpecker, 1; House Wren, 1; Wood Thrush, 1; Am. Redstart, 1; Com. Grackle, 1. Total: 20 species; 58 territorial males (184, 75). Remarks: Nests found: Com. Flicker, 1; House Wren, 1. The most striking changes compared to 1972 were in the flycatchers. Least Flycatcher dropped from 2 males to 1 visitor. Acadian Flycatcher increased from zero to 4 males. Eastern Wood Pewee increased from 1 to 3 males. This may be indicative of increasing density of understory habitat in the two-year period. Yellow-billed Cuckoo increased from 1 to 4 males. Ovenbird, previously 2 males, disappeared, which is difficult to explain, since habitat appears suitable, and it was heard calling in similar habitat nearby. Despite some individual changes, the total number of species remained the same at 20, but total

number of males increased from 45.5 to 58. This may reflect decrease in human intrusion in the sanctuary area. Mammals observed regularly in the census plot were Gray Squirrel and White-tailed Deer. Special thanks to C. John Ralph, Carol Ralph, and Carter Atkinson for their assistance. MALCOLM M. SIMONS, JR. and RUTH H. SIMONS, P.O. Box 699, Carlisle, Pa. 17013.

12. UPLAND OAK-MAPLE FOREST. — Location: Pennsylvania; Clinton Co., about 1.5 air miles north of Woolrich, and 1,450 ft NW of the "Avis" USC&GS control marker, in the Tiadaghton State Forest; $41^\circ 7' \text{N}$, $77^\circ 15' \text{W}$, Jersey Shore Quadrangle, USGS. Continuity: Established 1968; 6 intermittent years. Size: 13.48 ha = 33.3 acres (rectangular, except for a small section 210 x 104.5 ft in the western corner of the area; surveyed) Description of Plot: See AFN 22: 664-665, 1968.

1973. Coverage: May 23, 27, 29-31; June 1, 3-4 All trips between 0700 and 1245 hours. Total man-hours 18. Census: Rufous-sided Towhee, 16.5 (122, 50); Com Yellowthroat, 10.5 (78, 32); Ovenbird, 9 (67, 27), Brown-headed Cowbird, 3.5 (26, 11); Black-and-white Warbler, 3 (22, 9); Brown Creeper, 2; Com. Flicker, 1, Hairy Woodpecker, 1; Great Crested Flycatcher, 1, Black-capped Chickadee, 1; Solitary Vireo, 1; Scarlet Tanager, 1; Broad-winged Hawk, 0.5; Downy Woodpecker, 0.5; E. Wood Pewee, 0.5; E. Bluebird, 0.5, Ruffed Grouse, +; Mourning Dove, +; Pileated Woodpecker, +; Least Flycatcher, +; White-breasted Nuthatch, +; Indigo Bunting, +. Total: 22 species; 52.5 territorial males or females ($390/\text{km}^2$, 158 per 100 acres). Remarks: A large increase in the number of territorial males is the most outstanding feature of this year's census. This is a result of increases in the three commonest species, the Rufous-sided Towhee, Com Yellowthroat and Ovenbird. During the previous five census years, the Rufous-sided Towhee was quite consistent, with a range of from 9-10 territorial males. This year the number of territorial males rose to 16.5, or an increase of 65% over the previous high of 10 in 1972. The previous high for the Com. Yellowthroat was 4 territorial males in 1970, 1971 and 1972. A total of 10.5 was present this year, an amazing increase. The Ovenbird has an increase of from 5 in 1972, to 9 territorial males this year. It is interesting that this great increase in the density of territorial birds has followed two years of extensive defoliation and mortality among the oak trees, brought about by the leaf roller insect, which was especially abundant in the region during the summers of 1970 and 1971. These insects were also present, but to a lesser degree, during the summer of 1968. This has resulted in a canopy that is much more open than originally, and perhaps in some other obscure habitat changes as well. In spite of all of the additional dead trees, there seems to be no apparent increase in hole-nesting species. The Brown Creeper increased from 0.5, its previous high, to 2 territorial males for this year.

1974. Coverage: May 30; June 4, 6, 9, 19, 22, 27-28 All trips between 0800 and 1335 hours. Total man-hours: 22. Census: Rufous-sided Towhee, 17 (126, 51), Com. Yellowthroat, 9 (67, 27); Ovenbird, 6 (44, 18), Black-and-white Warbler, 2; White-breasted Nuthatch, 1.5; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Black-

capped Chickadee, 1; Brown Creeper, 1; E. Bluebird, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Downy Woodpecker, 0.5; Pine Warbler, 0.5; Rose-breasted Grosbeak, 0.5; Broad-winged Hawk, +; Mourning Dove, +; Pileated Woodpecker, +. **Total:** 20 species; 46 territorial males or females ($341/\text{km}^2$, 138 per 100 acres). **Remarks:** The large increase in the number of territorial males that occurred last year was almost maintained, but with a 12% drop for this year. Of the three species that greatly increased last year, the Rufous-sided Towhee went up slightly from 16.5 to 17 territorial males, the Com. Yellowthroat dropped 1.5 to 9, and the Ovenbird dropped from 9 to 6, closer to its numbers during previous years. Thus the larger number of territorial males this year can be attributed primarily to only two species. However, the total territorial males or females is still 17% above the pre-1973 high of 39.5 in 1971. The Wood Thrush was absent for the second year in a row, and the Red-eyed Vireo has now been absent for the past three years. The Black-and-white Warbler and Brown Creeper are both down 1 territorial male. Except for the White-breasted Nuthatch, once again there is no increase in the hole-nesting species. — PAUL W. SCHWALBE, Department of Biology, Lock Haven State College, Lock Haven, Pa. 17745.

13. MATURE NORTHERN HARDWOODS. — **Location:** West Virginia; Brooke Co., Weimer Nature Trails of Bethany College, Bethany, $40^\circ 12' 45''\text{N}$; $80^\circ 35' 55''$ to $80^\circ 33' 45''\text{W}$; Bethany Quadrangle, USGS. **Continuity:** Established 1971; 2 intermittent years. **Size:** 12.2 ha = 30 acres (square). **Description of Plot:** See AB 25 972-973, 1971. **Coverage:** April 11, 19, 29; June 5, 7, 12-15, 19. Twelve trips between 0540 and 1900 hours. Total party-hours: 20. **Census:** Acadian Flycatcher, 10.5 (86, 35); Cerulean Warbler, 7 (58, 23); Red-eyed Vireo, 5 (41, 17); Wood Thrush, 4 (33, 13); Blue-gray Gnatcatcher, 4; Cardinal, 4; Downy Woodpecker, 3 (25, 10); E. Wood Pewee, 3; Carolina Chickadee, 2.5; Tufted Titmouse, 2; Kentucky Warbler, 2; Great Crested Flycatcher, 1.5; Scarlet Tanager, 1.5; Pileated Woodpecker, 1; White-breasted Nuthatch, 1; House Wren, 1; Carolina Wren, 1; Indigo Bunting, 1; Com. Flicker, 0.5; Am. Robin, 0.5; Louisiana Waterthrush, 0.5; Com. Grackle, 0.5; Brown-headed Cowbird, 0.5; Cooper's Hawk, +; Ruffed Grouse, +; Screech Owl, +; Chimney Swift, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; E. Phoebe, +; Com. Crow, +; Am. Redstart, +; Rufous-sided Towhee, +. **Total:** 33 species; 57.5 territorial males ($474/\text{km}^2$, 192 per 100 acres). **Remarks:** Nests found: Downy Woodpecker, 1; E. Phoebe, 1; Acadian Flycatcher, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1. A second pair of Downy Woodpeckers was observed feeding young out of the nest. There is a decline of 20 breeding males compared to the 1971 census which shows 77.5 breeding males. A dry spring resulting in few flying insects may have forced insectivorous species such as the Acadian Flycatcher and Blue-gray Gnatcatcher to establish larger territories. Also the old field on the north border of the study area is maturing rapidly, leading to a decline in edge species. — ROBERT BELL, MARCIA LAMBERTS, A.R. BUCKELOW, JR. (compiler), Biology Department, Bethany College, Bethany, W. Va. 26032.

14. MATURING OAK-HICKORY FOREST. — **Location:** West Virginia; Ritchie Co., North Bend State Park, 2.5 miles E of Cairo; $39^\circ 13' 00''\text{N}$, $81^\circ 6' 52''\text{W}$, Harrisville Quadrangle, USGS. Starts 500 ft from County Road 14 and extends W along Nature Trail. **Continuity:** Established 1972; 2 intermittent years. **Size:** 6.7 ha = 15 acres (rectangular, 100 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** See AB 26: 947, 1972. A quantitative vegetation survey shows: Trees 3 inches diameter and over, based on six circular samples, 280/acre; total basal area $96.3 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total number of trees: Chestnut Oak (*Quercus prinus*) 53, 19, 27, 67; Pignut Hickory (*Carya glabra*) 48, 18, 18, 83; Dead trees 30, 12, 2, 83; Scrub Pine (*Pinus virginiana*) 26, 23, 7, 67; Sassafras (*Sassafras albidum*) 23, 9, 11, 33; Scarlet Oak (*Q. coccinea*) 23, 9, 18, 67; White Oak (*Q. alba*) 15, 6, 3, 50; Red Oak (*Q. rubra*) 13, 5, 5, 67; Sugar Maple (*Acer saccharum*) 10, 4, 7, 50; Red Maple (*A. rubrum*) 8, 3, 25, 33; Black Oak (*Q. velutina*) 7, 2, 23, 50. Trees by diameter size class: A (3-6 in.) 108, 39, 11.0, 7; B (6-9 in.) 55, 19, 17.7, 10; C (9-15 in.) 80, 29, 64.0, 39; D (15-21 in.) 30, 11, 48.0, 30; E (21-27 in.) 7, 20, 6, 13. Shrub stems/acre 8500; ground cover 37%; canopy cover 78%; average canopy height 64.5 ft (range 43-94). **Coverage:** June 2-6 All trips between 0530 and 0730. Total man-hours: 18. **Weather:** Clear and temperate throughout the period with light fog on three mornings. **Census:** Cerulean Warbler, 8 (132, 53); Ovenbird, 4 (66, 27); Blue-gray Gnatcatcher, 3 (49, 20); Pine Warbler, 3; E. Wood Pewee, 2; Wood Thrush, 2; Red-eyed Vireo, 2; Hooded Warbler, 2; Rufous-sided Towhee, 2; Downy Woodpecker, 1; Acadian Flycatcher, 1; Blue Jay, 1; White-breasted Nuthatch, 1; Yellow-throated Vireo, 1; Black-and-white Warbler, 1; Worm-eating Warbler, 1; Kentucky Warbler, 1; Summer Tanager, 1; Whippoorwill, +; Com. Flicker, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Tufted Titmouse, +; Brown-headed Cowbird, +; Scarlet Tanager, +. **Total:** 25 species; 44 territorial males ($725/\text{km}^2$, 293 per 100 acres). **Remarks:** Although no physical change in the plot was apparent, there was a decrease in Red-eyed Vireo, Ovenbird, Wood Thrush; neither species of cuckoo was heard or seen. The territories of the breeding birds appeared well established, since the singing males remained fairly stationary during the period of census. Special thanks to George Koch and Glen Phillips for assistance with the quantitative habitat description. — NEVADA LAITSCH (compiler) assisted by members of the Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

15. OAK-BEECH-TULIP-TREE FOREST. — **Location:** West Virginia; Kanawha Co., 3.5 miles S of South Charleston; center line starts at $38^\circ 19' 08''\text{N}$, $81^\circ 41' 42''\text{W}$ and extends south curving to the east, Charleston West Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. (Formerly called Oak-Hickory Forest.) See AB 26: 946-947, 1972. **Size:** 6.07 ha = 15 acres (rectangular 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Dominant canopy trees are oak (*Quercus* sp.) and Am. Beech (*Fagus grandifolia*). The open canopy has allowed a partial understory canopy to

form at about 15 ft, composed of Flowering Dogwood (*Cornus florida*), Maple-leaved Viburnum (*Viburnum acerifolium*) and seedlings of the canopy trees. The ground cover includes Greenbrier (*Smilax glauca*), Showy Skullcap (*Scutellaria serrata*), Christmas Fern (*Polystichum acrostichoides*) and grasses. A quantitative vegetative survey shows: Trees 3-inch diameter and over, based on six circular samples, 182 per acre; total basal area 121 ft² per acre. Species comprising 90% of the total number of trees: White Oak (*Quercus alba*) 27, 15, 19, 100; Black Oak (*Q. velutina*) 17, 9, 9, 83; Red Oak (*Q. rubra*) 8, 5, 3, 33; Chestnut Oak (*Q. prinus*) 5, 3, 6, 33; Am. Beech 18, 10, 26, 67; Tulip-tree (*Liriodendron tulipifera*) 28, 16, 15, 83; Hickory (*Carya* sp.) 23, 13, 4, 67; Sourwood (*Oxydendrum arboreum*) 17, 9, 5, 83; Cucumber Magnolia (*Magnolia acuminata*) 5, 3, 3, 50; Red Maple (*Acer rubrum*) 5, 3, 3, 17; Sugar Maple (*A. saccharum*) 4, 2, 1, 17; dead trees 5, 3, 1, 33. Trees by diameter size class: A (3-6 in.) 87, 48, 8, 7, 7; B (6-9 in.) 32, 17, 9, 5, 8; C (9-15 in.) 27, 15, 21.4, 18; D (15-21 in.) 30, 16, 54.1, 45; E (21-27 in.) 5, 3, 15.5, 13; G (33-40 in.) 2, 1, 11.8, 10. Shrub stems per acre: 7370; ground cover 47%; canopy cover 64%; average canopy height 80 ft. (range 56-90). **Weather:** Generally seasonable and steady with little wind, and no major rainfall until the weekend of June 1. Skies were clear to mildly overcast. There were, however, extreme fluctuations of temperature from day to day from balmy to bitterly cold. **Coverage:** May 9, 15-16, 22, 24-25, 27-28, 30; June 10, 14. Most trips between 0615 and 0900, but samplings made at all morning hours up to 1400, with one trip in the early evening. Total man-hours: 25. **Census:** Red-eyed Vireo, 9 (148, 60); Ovenbird, 6 (99, 40); Tufted Titmouse, 4 (66, 27); Wood Thrush, 4; Cerulean Warbler, 4; Hooded Warbler, 4; Cardinal, 3 (49, 20); Acadian Flycatcher, 2.5; White-eyed Vireo, 2.5; Rufous-sided Towhee, 2.5; Carolina Wren, 2; Blue-gray Gnatcatcher, 2; Black-and-white Warbler, 2; Am. Redstart, 2; Scarlet Tanager, 2; Kentucky Warbler, 1.5; Indigo Bunting, 1.5; E. Wood Pewee, 1; Worm-eating Warbler, 1; White-breasted Nuthatch, 0.5; Downy Woodpecker, 0.5; Broad-winged Hawk, +; Yellow-billed Cuckoo, +; Chimney Swift, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; Yellow-throated Vireo, +; Yellow-throated Warbler, +; Louisiana Waterthrush, +; Brown-headed Cowbird, +; Summer Tanager, +. **Total:** 34 species; 57.5 territorial males (947 km², 383 per 100 acres). **Remarks:** No physical changes occurred on the area or in its vicinity during the year, nor were there any significant changes in population (with the exception of the increase of Red-eyed Vireos) — only some re-shuffling of territories. Important for the record was the emergence this season of Brood XIV of the 17-year Cicada in the southern part of West Virginia in which this study area is located. A very heavy irruption began on May 10 and continued throughout the study period; sound pollution was a hindrance. A Gray Squirrel, E. Cottontail and Box Turtle were seen. Very special thanks to George Koch who did the James-Shugart survey on the plot and prepared the new quantitative habitat description. — CONSTANCE R. KATHOLI, Brooks Bird Club, 930 Woodland Avenue, South Charleston, W. Va. 25303.

16. OAK — MAPLE — HICKORY FOREST. — **Location:** West Virginia; Ritchie Co., 3 miles NE of Petroleum (4.5 miles by road). The centerline starts at 39°13'12"N, 81°13'22"W, Cairo Quadrangle, USGS, and extends E up a point for 825 ft, then NE along ridge. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** The canopy is dominated by oak with maple and hickory a poor second and third. The understory is mostly saplings of the canopy species plus Flowering Dogwood (*Cornus florida*) and Maple-leaved Viburnum (*Viburnum acerifolium*). Most prominent in the ground cover are Black Snakeroot (*Cimicifuga racemosa*) and Virginia Creeper (*Parthenocissus quinquefolia*) but there are many other plants including ferns and grasses. From a quantitative vegetation survey of six circular samples: Trees 3 inches dbh and over 219/acre; total basal area 96.0 ft²/acre. Species comprising 90% of the total number of trees: White Oak (*Quercus alba*), 35, 16, 17, 67; Chestnut Oak (*Q. prinus*), 17, 8, 6, 33; Red Oak (*Q. rubra*), 12, 5, 12, 33; Black Oak (*Q. velutina*) 2, 1, 1, 17; Scarlet Oak (*Q. coccinea*), 8, 4, 16, 67; Sugar Maple (*Acer saccharum*), 42, 19, 10, 67; Red Maple (*A. rubrum*), 18, 9, 5, 50; Black Maple (*A. nigrum*), 2, 1, 0, 17; Mockernut Hickory (*Carya tomentosa*), 17, 8, 4, 17; Shagbark Hickory (*C. ovata*), 7, 3, 4, 50; dead trees, 33, 15, 11, 100. Trees by diameter size class: A (3-6 in.) 17, 8, 4, 17, B (6-9 in.) 37, 17, 11.0, 11; C (9-15 in.) 58, 27, 48.0, 51, D (15-21 in.) 12, 5, 21.0, 22; E (21-27 in.) 2, 1, 5.2, 5. Shrub stems/acre 4900; ground cover 47%; canopy cover 71%, average canopy height 74 ft. (range 58-87). **Edge:** The forest continues in all directions. **Topography:** For 825 ft the centerline follows a narrow ridge from El 850-1000 ft. with sides as much as 50 ft lower, then continues along an almost level and wider ridge with sides to 20 ft lower. **Weather:** Warm, usually partly cloudy. Wind light, if any. No rain during census trips and only twice during night before a trip. **Coverage:** April 30; May 6, 9; June 2, 4-6; July 1, 4. Eighteen trips between dawn and 0800, one trip in the afternoon, and one in the evening. Total party-hours: census 23, vegetation 5. **Census:** Cerulean Warbler, 9 (148, 60); Ovenbird, 8 (132, 53); Red-eyed Vireo, 5 (82, 33); Wood Thrush, 3 (49, 20); Hooded Warbler, 3; E. Wood Pewee, 2.5; Yellow-billed Cuckoo, 2; Tufted Titmouse, 2; Blue-gray Gnatcatcher, 2; Scarlet Tanager, 2; Great Crested Flycatcher, 1.5; White-breasted Nuthatch, 1.5; Yellow-throated Vireo, 1.5; Downy Woodpecker, 1; Acadian Flycatcher, 1; Black-and-white Warbler, 1; Worm-eating Warbler, 1; Black-billed Cuckoo, 0.5; Carolina Wren, 0.5; Ruffed Grouse, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Carolina Chickadee, +; Brown-headed Cowbird, +; Summer Tanager, +; Cardinal, +. **Total:** 26 species; 48 territorial males (791/km², 320 per 100 acres). **Remarks:** Of the species on or establishing territory April 30 the Ovenbirds and Scarlet Tanagers were still singing on the same territories July 4. The song of the Wood Thrushes had dropped to one third by July. By May 9 all the Cerulean Warblers and half the Red-eyed Vireos and Hooded Warblers had moved in. All of these were singing at about two thirds of normal song activity in July. One Wood Thrush nest was found. — GEORGE KOCH

(compiler), ELIZABETH DEGARMO, GLEN PHILIPS, JERRY MCGREW, MIKE WILLIAMS, ANN LLEWELLYN, MAXINE THACKER, LAURA KOCH, EDNA GREGG, CAROLYN RUDDLE, KYLE BUSH, PAUL MCKENZIE, RUTH STROSNIDER, JUANITA DELANCEY, MARY RIEFFENBERGER, *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

17. UNEVEN AGED PARK WOODLAND. — **Location:** West Virginia; Ritchie Co., 3 miles NE of Cairo, part of the nature trails system of North Bend State Park; 39°13'14"N, 81°7'09"W, Harrisville Quadrangle, USGS. **Continuity:** Established 1972; 2 intermittent years. **Size:** 6.07 ha = 15 acres (rectangular 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** (See AB 26: 950, 1972.) The dominant canopy trees are Tulip-tree (*Liriodendron tulipifera*), Am. Beech (*Fagus grandifolia*) and hickory (*Carya* sp.). Most prominent in the understory are Spicebush (*Lindera benzoin*), Sassafras (*Sassafras albidum*), basswood (*Tilia* sp.) and seedlings of Red Maple (*Acer rubrum*) and Flowering Dogwood (*Cornus florida*). The ground cover is primarily Virginia Creeper (*Parthenocissus quinquefolia*), Poison Ivy (*Rhus radicans*), May Apple (*Podophyllum peltatum*), cinquefoil (*Potentilla* sp.), Christmas Fern (*Polystichum acrostichoides*) and Blue Cohosh (*Caulophyllum thalictroides*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 173/acre; total basal area 58.5 ft²/acre. Species comprising 90% of the total number of trees: Tulip-tree, 43, 25, 23, 67; Am. Beech, 2, 1, 20, 17; Mockernut Hickory (*Carya tomentosa*), 33, 19, 11, 50; Shagbark Hickory (*C. ovata*), 12, 7, 7, 50; Sugar Maple (*Acer saccharum*), 15, 8, 11, 33; Scrub Pine (*Pinus virginiana*), 11, 6, 7, 50; Black Gum (*Nyssa sylvatica*), 7, 4, 1, 33; Sycamore (*Platanus occidentalis*), 5, 3, 1, 17; Flowering Dogwood, 5, 3, 1, 33; Ohio Buckeye (*Aesculus glabra*), 5, 3, 1, 33; Water Beech (*Carpinus caroliniana*), 5, 3, 1, 17; Red Maple, 3, 2, 1, 17; dead trees, 11, 6, 4, 67. Trees by diameter size class: A (3-6 in.) 107, 61, 6.4, 18; B (6-9 in.) 45, 25, 8.1, 23; C (9-15 in.) 23, 13, 10.4, 29; E (21-27 in.) 1, 1, 3.1, 9; G (33-40 in.) 1, 1, 7.1, 20. Shrub stems/acre: 39,300; ground cover 44%; canopy cover 80%, average canopy height 76 ft (range 63-100). Since this area was surveyed in 1972 a power line was put through part of the area, and forms the northeast edge for a distance of 500 ft. **Weather:** Warm and dry throughout census period. **Coverage:** June 2-6, 8 trips between dawn and 0745, 2 between 1000 and 1100, 1 between 1400 and 1500, and 2 between 1920 and 2040. Total man-hours: 41. **Census:** Ovenbird, 5 (82, 33); Acadian Flycatcher, 4 (66, 27); Wood Thrush, 3 (49, 20); Red-eyed Vireo, 3; Cerulean Warbler, 3; Rufous-sided Towhee, 2.5; Carolina Chickadee, 1.5; Kentucky Warbler, 1.5; Scarlet Tanager, 1.5; Com. Flicker, 1; Tufted Titmouse, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; N. Parula, 1; Pine Warbler, 1; Am. Robin, 0.5; Louisiana Waterthrush, 0.5; Summer Tanager, 0.5; Indigo Bunting, 0.5; Ruffed Grouse, +; Screech Owl, +; Whip-poor-will, +; Chimney Swift, +; Pileated Woodpecker, +; Hairy Woodpecker, +; Downy Woodpecker, +;

Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +; White-breasted Nuthatch, +; Carolina Wren, +, Brown-headed Cowbird, +. **Total:** 32 species; 33 territorial males (544/km², 220 per 100 acres). **Remarks:** Three nests were located: Com. Flicker, Carolina Chickadee, Wood Thrush. The power line explains the increase in edge-loving birds, such as Blue-winged and Yellow-throated Warblers. The decrease in territorial males may be owing to the fact that the census this year was taken a week later than in 1972. For further remarks concerning this area see the 1972 census (AB 26: 950, 1972). Special thanks to the many members of the Brooks Bird Club who helped with the vegetation survey and especially to George Koch and Glen Phillips — LIBBEY DeGARMO, BILL SMITH, and ANNE and GREG EDDY (compilers), *Brooks Bird Club*, 707 Warwood Ave., Wheeling, W. Va. 26003.

18. DECIDUOUS FOREST WITH POND AND BROOK. — **Location:** New Jersey; Bergen Co., Mahwah, Campgaw Mountain Reservation. **Continuity:** Established 1964; 11 consecutive years. **Size:** About 16.2 ha = 40 acres (rectangular, 250 x 800 yards, paced). **Description of Plot:** See AFN 19:623-624, 1965 **Coverage:** May 28, 30; June 4, 6, 11, 13, 18, 20, 25 Hours of coverage were 0530 to 0645. Total man-hours 62. **Census:** Veery, 4 (25, 10); Starling, 4; Black-capped Chickadee, 3 (19, 8); Tufted Titmouse, 3; Wood Thrush, 3; Downy Woodpecker, 2; Gray Catbird, 2, Red-eyed Vireo, 2; Blue-winged Warbler, 2; Com. Yellowthroat, 2; Scarlet Tanager, 2; Cardinal, 2; Canada Goose, 1; Com. Flicker, 1; Great Crested Flycatcher, 1, E. Wood Pewee, 1; Tree Swallow, 1; Blue Jay, 1, White-breasted Nuthatch, 1; Am. Robin, 1; Ovenbird, 1; Louisiana Waterthrush, 1; Red-winged Blackbird, 1, N. Oriole, 1; Com. Grackle, 1; Indigo Bunting, 1, Rufous-sided Towhee, 1. **Total:** 27 species; 46 territorial males (284/km², 115 per 100 acres). — JOHN BROTHERTON, *Fyke Nature Association*, Box 141, Ramsey, N.J. 07446.

19. GUM-BEECH-OAK FLOODPLAIN FOREST AND SWAMP. — **Location:** Maryland; Charles Co., Nanjemoy, Douglas Point Proposed Nuclear Power Generating Station (Plot 1), 1 mile S intersection of Route 224 and Liverpool Point Road, adjacent to the Potomac River; 38°26'N, 77°15'W, Widewater Quadrangle, USGS. **Continuity:** New. **Size:** 11.6 ha = 28.7 acres (rectangle, 1000 x 1250 ft, surveyed using a 1/4 acre grid). **Description of Plot:** The dominant canopy trees are Sweet Gum (*Liquidambar styraciflua*), Am. Beech (*Fagus grandifolia*), and Swamp Chestnut Oak (*Quercus michauxii*). Most prominent in the understory are Pawpaw (*Asimina triloba*) and Spicebush (*Lindera benzoin*). The ground cover is primarily Japanese Honeysuckle (*Lonicera japonica*), Running Pine (*Lycopodium flabelliforme*), Jack-in-the-Pulpit (*Arisaema triphyllum*), and Poison Ivy (*Rhus radicans*). A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, based on six circular samples, 177/acre; total basal area 115.4 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]: Sweet Gum, 75,

42, 17, 100; Am. Beech, 11, 6, 15, 67; Swamp Chestnut Oak, 18, 10, 14, 50; Tulip-tree (*Liriodendron tulipifera*), 11, 6, 11, 50; Dead trees, 11, 6, 8, 83; Spanish Oak (*Q. falcata*), 11, 6, 8, 33; Scarlet Oak (*Q. coccinea*), 10, 6, 5, 17, White Oak (*Q. alba*), 2, 1, 4, 17; Bitternut Hickory (*Carya cordiformis*), 3, 2, 4, 33; Black Gum (*Nyssa sylvatica*), 11, 6, 4, 67. Trees by diameter size class [figures after each give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance (%)]: A (3-6 in.) 88, 44, 8.8, 8; B (6-9 in.) 24, 13, 7.2, 6; C (9-15 in.) 42, 29, 33.3, 29; D (15-21 in.) 16, 9, 28, 8, 25; E (21-27 in.) 5, 3, 14.8, 13; F (27-33 in.) 2, 1, 7.8, 7; G (over 40 in.) 2, 1, 14.5, 12. Shrub stems/acre: 35,333; ground cover 68%; canopy cover 99%; average canopy height 85 ft (range 77-105). **Edge:** The north and south are bordered by extensive tracts of similar forest habitat. The western boundary varies from only a few hundred feet to several hundred yards in distance from the Potomac River shoreline. The eastern edge has several hundred yards of similar forest before ending at Route 224. **Topography:** Approximately 50% swamp bottom, standing water to mud, with bank rising rapidly to terrace elevation which constitutes the balance of the study area. **Elevation:** 5 to 25-30 ft. **Weather:** Exceptionally wet and cool throughout census period with a week of heavy rain in late June. **Coverage:** May 18-19; June 8, 23 (2 trips), 25-26; July 4, 6. All trips between 0600 and 1400 and 1500 and 1930 hours. Total man-hours: 28.5. **Census:** Red-eyed Vireo, 29 (250, 101); N. Parula, 10 (86, 35); Acadian Flycatcher, 9 (77, 31); Red-bellied Woodpecker, 8 (69, 28); Tufted Titmouse, 8, Carolina Wren, 8; Downy Woodpecker, 5 (43, 17); Carolina Chickadee, 5; Cardinal, 5; Yellow-billed Cuckoo, 4 (34, 14); Wood Thrush, 4; Blue-gray Gnatcatcher, 4; Yellow-throated Vireo, 4; Louisiana Waterthrush, 4; Kentucky Warbler, 4; Hairy Woodpecker, 3 (26, 10); Scarlet Tanager, 3; Red-winged Blackbird, 2.5; E. Wood Pewee, 2; Blue Jay, 2; Indigo Bunting, 2; Green Heron, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; Prothonotary Warbler, 1; Com. Yellowthroat, 1; Brown-headed Cowbird, 1; Mourning Dove, +; Barred Owl, +; Com. Flicker, +; White-eyed Vireo, +; Yellow-throated Warbler, +; Com. Grackle, +; Summer Tanager, +; Am. Goldfinch, +. **Total:** 36 species; 132.5 territorial males or females (1141/km², 462 per 100 acres). **Remarks:** The number of species is relatively high as compared to the drier higher elevation areas. There is a very high woodpecker population. The presence of the Red-winged Blackbird, Indigo Bunting, Com. Yellowthroat, Green Heron, and White-eyed Vireo is owing to a 1.5 acre marsh in the northwest corner which converges with the swamp. The Red-eyed Vireo population is exceptionally high and the Cardinal population is very low. Four nests were located — Acadian Flycatcher, (2); Carolina Wren; Wood Thrush. Fledglings observed — Barred Owl, Hairy Woodpecker, Acadian Flycatcher, Tufted Titmouse, Carolina Wren, Wood Thrush, Louisiana Waterthrush, Kentucky Warbler. Amphibians — N. Red Salamander, Am. Toad, Fowler's Toad, N. Cricket Frog, Spring Peeper, Gray Treefrog, Bullfrog, Green Frog, Wood Frog. Reptiles — Snapping Turtle, E. Mud Turtle, E. Box Turtle, N. Water Snake, E. Garter Snake, Black Rat Snake, E.

Kingsnake. Mammals — Starnose Mole, E. Mole, Shorttail Shrew, Raccoon, Red Fox, E. Gray Squirrel, S. Flying Squirrel, White-footed Mouse, Rice Rat, Pine Vole, Muskrat, Whitetail Deer, feral dog. — FRED P BURGGRAF, DAVID W. HOLMES, PAUL M MCKENZIE and M. KATHLEEN KLIMKIEWICZ (compiler), *Douglas Point Field Station, Box 26, Nanjemoy, Md.* 20662.

20. HICKORY-OAK-ASH FLOODPLAIN FOREST. — **Location:** Maryland; Howard Co., Middle Patuxent River, due W of the Hobbits Glen Golf Course, Columbia; 39°15'10"N, 76°54'45"W, Clarksburg Quadrangle, USGS. **Continuity:** Established 1971, 3 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. **Coverage:** May 25; June 5, 18, 20, 22; July 3, 6, 13. All eight trips in early morning, starting within 30 minutes of sunrise Total man-hours: 34. **Census:** Gray Catbird, 31.5 (171, 69); Acadian Flycatcher, 19 (103, 42); Am. Redstart, 14.5 (79, 32); Cardinal, 13 (71, 29); Red-eyed Vireo, 11 (60, 24); Tufted Titmouse, 10 (54, 22); Downy Woodpecker, 9 (49, 20); Com. Yellowthroat, 8.5 (46, 19); White-eyed Vireo, 8 (43, 18); Blue-gray Gnatcatcher, 7.5 (41, 16); Carolina Chickadee, 6 (33, 13); Wood Thrush, 5.5 (30, 12); Carolina Wren, 5 (27, 11); N. Parula, 5; E. Wood Pewee, 4.5 (24, 10); Kentucky Warbler, 4.5; Brown-headed Cowbird, 4.5; Yellow-billed Cuckoo, 4 (22, 9); Ruby-throated Hummingbird, 4, Veery, 4; Red-bellied Woodpecker, 3.5 (19, 8); Scarlet Tanager, 3 (16, 7); Louisiana Waterthrush, 2.5; Mourning Dove, 2; White-breasted Nuthatch, 2; Cerulean Warbler, 2; Indigo Bunting, 2; Com. Flicker, 1.5, Yellow-throated Vireo, 1.5; Hairy Woodpecker, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Blue Jay, 1, N. Oriole, 1; Rufous-sided Towhee, 1; Am. Goldfinch, 1; Wood Duck, 0.5; Pileated Woodpecker, 0.5; Com. Crow, 0.5; Hooded Warbler, 0.5; Turkey Vulture, +, Red-shouldered Hawk, +; Broad-winged Hawk, +, Belted Kingfisher, +. **Total:** 44 species; 208 territorial males (1,130/km², 457 per 100 acres). **Remarks:** Last year's report stressed the habitat changes that resulted from the floodwaters of Hurricane Agnes on June 22, 1972. The loss of old canopy trees along the Middle Patuxent River has permitted a vigorous growth of shrub species, and this, in turn, has resulted in a dramatic increase in catbirds from 10.5 territories in 1971 to 27.5 in 1973 and 31.5 in 1974. American Redstarts have more than recovered from their decline in 1973 and increased from 8 to 14.5 territories in 1974. The Com. Yellowthroat also has responded to the habitat changes, rising from 2.5 territories in 1971 to 4 territories in 1973 and 8.5 in 1974. The only species to show a marked decline in 1974 was the Cardinal, which dropped from 18 to 13 territories. The total population has increased from 180 territories in 1971 to 196 in 1973 and 208 in 1974. The N. Oriole and Wood Duck nested for the first time this year. — CHANDLER S. ROBBINS, *Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, Md 20811.*



21. HOLLY-GUM-OAK FLOODPLAIN FOREST AND ASH SWAMP. — **Location:** Maryland; Charles Co., Nanjemoy, Douglas Point Proposed Nuclear Power Generating Station (Plot 3), 1 mile S of intersection of Route 224 and Liverpool Point Road, adjacent to the Potomac River; 38°26'N, 77°15'W, Widewater Quadrangle, USGS. **Continuity:** New. **Size:** 11.6 ha = 28.7 acres (rectangle, 1000 x 1250 ft, surveyed in a 1.4 acre grid). **Description of Plot:** The dominant canopy trees are Black Gum (*Nyssa sylvatica*), Sweet Gum (*Liquidambar styraciflua*) and Swamp Chestnut Oak (*Quercus michauxii*). Most prominent in the understory are Am. Holly (*Ilex opaca*), Spicebush (*Lindera benzoin*), Greenbriar (*Smilax rotundifolia*), and Swamp Magnolia (*Magnolia virginiana*). The ground cover is primarily Lizard's Tail (*Saururus cernuus*) and Jewelweed (*Impatiens capensis*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on six circular samples, 219/acre; total basal area 115.0 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. Holly, 77, 35, 8, 100; Black Gum, 30, 14, 6, 100; Dead trees, 24, 11, 12, 83; Sweet Gum, 19, 9, 15, 100; Swamp Chestnut Oak, 18, 8, 20, 83; Pumpkin Ash (*Fraxinus tomentosa*), 13, 6, 3, 17; Red Ash (*F. pennsylvanica*), 8, 4, 4, 17; Spanish Oak (*Q. falcata*), 10, 4, 16, 67. Trees by diameter size class [figures after each give number of trees/acre, relative density (%), basal area in square ft./acre, relative dominance (%)]: A (3-6 in.) 115, 53, 11.5, 10; B (6-9 in.) 35, 16, 10.5, 9; C (9-15 in.) 40, 18, 32, 28; D (15-21 in.) 24, 11, 43.2, 38; E (21-27 in.) 3, 1.5, 9.9, 9; F (27-33 in.) 2, 0.5, 7.9, 6. Shrub stems/acre: 26,667; ground cover 49%; canopy cover 98%, average canopy height 76 ft. (range 63-99). **Edge:** The northern, eastern and southern boundaries are similar forest habitats. The western boundary consists of 25-500 ft of similar forest and swamp ending on the Potomac River shore. **Topography:** Approximately 35% swamp bottom, standing water to mud, with bank rising rapidly to terrace elevation which constitutes the balance of the study area. **Elevation:** 2-30 ft. **Weather:** Exceptionally wet and cool throughout census period with a week of heavy rain in late June. **Coverage:** June 22-23, 24 (2 trips); July 4 (2 trips), 6 (2 trips). All trips between dawn and 1100 and 1800 and 2030 hours. Total man-hours: 20.5. **Census:** Red-eyed Vireo, 26 (224, 91); Red-bellied Woodpecker, 8 (69, 28); Acadian Flycatcher, 8; N. Parula, 8; Tufted Titmouse, 6.5 (56, 23); Carolina Wren, 5 (43, 17); Yellow-throated Vireo, 4.5 (39, 16); Carolina Chickadee, 4 (34, 14); Blue-gray Gnatcatcher, 4; Cardinal, 4; Yellow-billed Cuckoo, 3 (26, 10); Louisiana Waterthrush, 3; Scarlet Tanager, 2.5; Downy Woodpecker, 2; Com. Crow, 2; E. Wood Pewee, 2; Wood Thrush, 2; Prothonotary Warbler, 2; Brown-headed Cowbird, 2; Great Crested Flycatcher, 1.5; Barred Owl, 1; Ruby-throated Hummingbird, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Blue Jay, 1; White-eyed Vireo, 1; Am. Goldfinch, 1; Green Heron, +; Red-shouldered Hawk, +; Am. Woodcock, +; Yellow-throated Warbler, +; Hooded Warbler, +; Com. Yellowthroat, +; Red-winged Blackbird, +; Indigo Bunting, +. **Total:** 35 species; 107 territorial males or females (921/km², 373 per 100 acres). **Remarks:** The

number of species is relatively high as compared to counts from the drier, higher elevation areas. The Red-eyed Vireo population was very high. The Cardinal population was lower than one would expect. This is one of the two plots located within the proposed construction site for the nuclear power station. Nests found: 1 Barred Owl; 1 Red-eyed Vireo. Fledglings — Hairy Woodpecker, Com. Crow, Great Crested Flycatcher, Tufted Titmouse, Blue-gray Gnatcatcher, White-eyed Vireo, Louisiana Waterthrush and Cardinal. Amphibians — Spotted Salamander, N. Dusky Salamander, N. Red Salamander, Am. Toad, Fowler's Toad, Green Frog, N. Leopard Frog, Spring Peeper, Gray Treefrog. Reptiles — Snapping Turtle, E. Mud Turtle, E. Box Turtle, N. Water Snake, Ringneck Snake, E. Worm Snake. Mammals — Starnose Mole, E. Mole, Raccoon, E. Gray Squirrel, S. Flying Squirrel, Muskrat, E. Cottontail, Whitetail Deer, feral dog — PAUL M. McKENZIE and M. KATHLEEN KLIMKIEWICZ (compiler), *Douglas Point Field Station, Box 26, Nanjemoy, Md. 20662*.

22. MATURE DECIDUOUS FLOODPLAIN FOREST. — **Location:** Maryland, Montgomery Co., Cabin John Island, Glen Echo, 2½ miles NW of the District of Columbia, between the C. and O. Canal and the Potomac River, just south of Cabin John Creek, Falls Church Quadrangle, USGS. **Continuity:** Established 1947; 22 intermittent years. **Size:** 7.6 ha = 18.75 acres (oblong, surveyed). **Description of Plot:** See AFN 1: 212-213, 1947. **Coverage:** April 7, 13-14, 20-21, 27-28, May 5 (3 trips), 11, 18, 26 (2 trips); June 12, 15 (2 trips), 16; July 7. All trips between 0445 and 1100 hours. Total man-hours: 47; average trip, 2.45 hours. **Census:** Starling, 20 (264, 107); Acadian Flycatcher, 9 (119, 48); Red-eyed Vireo, 9; Carolina Wren, 8 (105, 43); Cardinal, 6 (79, 32); Tufted Titmouse, 5.5 (72, 29); Carolina Chickadee, 5 (66, 27); N. Parula, 5; Am. Redstart, 5; Downy Woodpecker, 4 (53, 21); Blue-gray Gnatcatcher, 4; E. Wood Pewee, 2; Brown-headed Cowbird, 2; Song Sparrow, 2; Prothonotary Warbler, 1.5; Wood Duck, 1; Barred Owl, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; White-breasted Nuthatch, 1; Brown Creeper, 1; Yellow-throated Vireo, 1. **Total:** 25 species; 98 territorial males (1292/km², 523 per 100 acres). **Remarks:** Nests found: Wood Duck, 1; Barred Owl, 1; Pileated Woodpecker, 1; Com. Flicker, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; Starling, 13. This year the total of territories is almost the same as last year but continues a decreased level of abundance which became apparent in 1972. The total, however, reflects a decrease of summer residents which started for some species as early as 1952, accompanied by an increase in permanent residents, particularly Starlings. Species which have disappeared as nesters are: Yellow-billed Cuckoo, Ruby-throated Hummingbird, Wood Thrush, Veery, Louisiana Waterthrush, Kentucky Warbler, Com. Yellowthroat and Hooded Warbler. Birds still nesting regularly but decreasing in numbers are: Red-eyed Vireo, N. Parula and Am. Redstart. The new nester which appeared this year was a winter resident

the Brown Creeper. A possible factor is extensive destruction of wooded habitat which has occurred on the other side of the canal from the area. — JOAN H. CRISWELL (compiler), W. H. CRAMER, J. R. GAUTHEY, DAVID MEHLMAN, DONALD MEHLMAN, MIEKE MEHLMAN, R. WHITCOMB, *Audubon Naturalist Society*, 8940 Jones Mill Rd., Washington, D.C. 20015.

23. MIXED HARDWOOD FOREST. — **Location:** Maryland, Calvert Co., NW of Plum Point and 1 mile inland from Chesapeake Bay on Tobacco Road between Routes 263 and 261. **Continuity:** Established 1960; 12 intermittent years. **Size:** 28 acres. **Description of Plot:** See AFN 13: 333, 1959. **Weather:** 17 trips were on clear days. High temperatures on census days varied between 55° and 95° F. The creek and bog were dry the last 2 weeks in July. **Coverage:** April 14, 19, 21, 24, 28-29; May 1, 4, 6, 8, 11, 13, 18, 20, 26, 28; June 4, 9, 11, 16, 26; July 1, 8, 15, 23, 29; August 10, 18. Total: 24 full trips averaged about 1.5 hours and started between 0650 and 0940 EST. **Census:** Red-eyed Vireo, 36 (318, 129); Wood Thrush, 32 (282, 114); Carolina Wren, 25 (221, 89); Cardinal, 21 (185, 75); Acadian Flycatcher, 16 (141, 57); Rufous-sided Towhee, 16; Ovenbird, 14 (124, 50); Tufted Titmouse, 11 (97, 39); N. Parula, 11; Hooded Warbler, 10 (88, 36); Kentucky Warbler, 9 (79, 32); Carolina Chickadee, 8 (71, 29); Scarlet Tanager, 8; Yellow-throated Vireo, 6 (53, 21); Downy Woodpecker, 5 (44, 18); Red-bellied Woodpecker, 4 (35, 14); E. Wood Pewee, 4; Mourning Dove, 3 (26, 11); Yellow-billed Cuckoo, 3; Louisiana Waterthrush, 3; Am. Woodcock, 2; Ruby-throated Hummingbird, 2; Hairy Woodpecker, 2; Great Crested Flycatcher, 2; Blue-gray Gnatcatcher, 2; Pine Warbler, 2; Am. Redstart, 2; Brown-headed Cowbird, 2; Indigo Bunting, 2; Blue Jay, 1; Worm-eating Warbler, 1; Com. Yellowthroat, 1; Com. Grackle 1; Summer Tanager, 1; Am. Goldfinch, 1; Field Sparrow, 1. **Total:** 36 species; 270 territorial males ($2383/\text{km}^2$, 964 per 100 acres). **Remarks:** The 36 species on territory equaled the previous 13-year average. The territorial males showed a decrease from last year's high of 297 to 270 but were still above the 12-year average of 233. The Red-eyed Vireo and Wood Thrush repeated as the most numerous species and each had only several less territories than last year. The Carolina Wren continued to increase and moved into third place ahead of the Cardinal and Acadian Flycatcher. It was the only species showing a marked increase. Other species increasing were Am. Woodcock, Great Crested Flycatcher and Pine Warbler. Losses were noted in Carolina Chickadee, Tufted Titmouse, Blue-gray Gnatcatcher, Brown-headed Cowbird and Cardinal. The once-common Yellow-throated Warbler occurred only once (April 29). There were no new species this year; 75 have been recorded in 12 censuses. — JOHN H. FALES, Ridge Road, Need Estate, Huntingtown, Md. 20639.

24. MIXED UPLAND HABITAT. — **Location:** Maryland; Montgomery Co., North Chevy Chase; 39°N, 77°W, USGS. **Continuity:** New. **Size:** 16.2 ha = 40 acres (oblong, surveyed). **Description of Plot:** See *Atlantic Naturalist* 24(2): 100-101, 1969. **Edge:** Bordered on all but one side by housing development; that one side by

Rock Creek Park. **Topography:** Varying 100+ ft from three hilltops to streambed. **Elevation:** 300 to 190 ft. **Coverage:** April 7, 11-14, 16, 23, 29, 30; May 1-2, 7-8, 10, 14, 22-23; June 3-4, 14, 21; July 3. All trips between 0500 and 1200 or 1445 and 1800 hours. Total man-hours: 41. **Census:** Starling, 22 (136, 55); Cardinal, 14 (86, 35); Com. Grackle, 10 (62, 25); Gray Catbird, 9 (56, 23); Carolina Chickadee, 8 (49, 20); Tufted Titmouse, 8; Carolina Wren, 8; Am. Robin, 6 (37, 15); Rufous-sided Towhee, 6; Mockingbird, 5.5 (34, 14); House Wren, 5 (31, 13); House Sparrow, 4.5 (28, 11); Mourning Dove, 4 (25, 10); Downy Woodpecker, 4; Blue Jay, 3 (19, 8); Wood Thrush, 3; Song Sparrow, 2.5 (15, 6); Com. Crow, 2; Fish Crow, 2; Com. Flicker, 2; Red-bellied Woodpecker, 2; Brown Thrasher, 2; White-eyed Vireo, 2; White-breasted Nuthatch, 1 (6, 3); Indigo Bunting, 1; Great Crested Flycatcher, +. **Total:** 26 species; 137 territorial males or females ($846/\text{km}^2$, 342 per 100 acres). **Remarks:** Thirty-five nests were located: Starling, 7; Cardinal, 1 with 3 young; Com. Grackle, 7 with 21 fledged; House Wren, 6 with 20 fledged; Gray Catbird, 5 with at least 4 fledged; Am. Robin, 5 with 5 fledged; Com. Crow, 2 with at least 3 fledged; Mourning Dove, 1 with 2 eggs; Downy Woodpecker, 1; Wood Thrush, 1 with 3 fledged. — HOLLY B. WAGNER, 8940 Jones Mill Road, Washington, D.C. 20015.

25. OAK-BEECH MIXED HARDWOOD FOREST. — **Location:** Maryland; Charles Co., Nanjemoy, Douglas Point Proposed Nuclear Power Generating Station (Plot 5), 1 mile S intersection of Route 224 and Liverpool Point Road, adjacent to the Potomac River, 38°26'N, 77°15'W, Nanjemoy Quadrangle, USGS. **Continuity:** New. **Size:** 11.6 ha = 28.7 acres (rectangle, 1000 x 1250 ft, surveyed in a 1.4 acre grid). **Description of Plot:** The dominant canopy trees are White Oak (*Quercus alba*), Scarlet Oak (*Q. coccinea*), Scrub Pine (*Pinus virginiana*) and Am. Beech (*Fagus grandifolia*). Most prominent in the understory are saplings of the canopy plus Mountain Laurel (*Kalmia latifolia*) and Greenbriar (*Smilax rotundifolia*). The ground cover is primarily Dangleberry (*Gaylussacia frondosa*). A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, based on six circular samples, 171/acre; total basal area $52.8 \text{ ft}^2/\text{acre}$. 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]: White Oak, 50, 30, 27, 83; Scarlet Oak, 21, 12, 17, 50; Scrub Pine, 21, 12, 10, 50; Am. Beech, 5, 4, 9, 67; Red Maple (*Acer rubrum*), 14, 8, 8, 83; Black Gum (*Nyssa sylvatica*), 11, 7, 5, 50; Swamp Chestnut Oak (*Q. michauxii*), 5, 4, 5, 50; Spanish Oak (*Q. falcata*), 2, 1, 5, 17; Post Oak (*Q. stellata*), 2, 1, 5, 17. Trees by diameter size class [figures after each give number of trees/acre, relative density (%), basal area in square ft/acre, relative dominance (%)]: A (3-6 in.) 99, 57, 9.9, 19; B (6-9 in.) 38, 22, 11.5, 22; C (9-15 in.) 32, 19, 25.6, 49; D (15-21 in.) 3, 2, 5.5, 10. Shrub stems/acre 43,833; ground cover 60%; canopy cover 92%; average canopy height 66 ft (range 30-86). **Edge:** Bordered on the northeastern half and the north by an extensive area of similar habitat. The western boundary is bordered by several hundred yards of similar woods which end at

Route 224. The southeastern boundary consists of several hundred yards of similar habitat ending at a large open grassy field. **Topography:** Essentially flat. **Elevation:** 80-85 ft. **Weather:** Exceptionally wet and cool throughout the period with a week of heavy rain in late June. **Coverage:** May 5, 18, 19, 26; June 9, 15, 22, 24. All trips between 0610 and 1100 and 1430 and 1600 hours. Total man-hours: 22.5. **Census:** Red-eyed Vireo, 17.5 (151, 61); Ovenbird, 13.5 (116, 47); Tufted Titmouse, 12 (103, 42); Acadian Flycatcher, 7.5 (65, 26); Wood Thrush, 6.5 (56, 23); Red-bellied Woodpecker, 6 (52, 21); Carolina Chickadee, 6; Carolina Wren, 4 (34, 14); Black-and-white Warbler, 3 (26, 10); Scarlet Tanager, 3; Rufous-sided Towhee, 3; Blue-gray Gnatcatcher, 2; Yellow-billed Cuckoo, 2; Whip-poor-will, 2; Downy Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Kentucky Warbler, 1; Hooded Warbler, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Cardinal, 1; Turkey, +; Mourning Dove, +; Great Horned Owl, +; Com. Flicker, +; Pileated Woodpecker, +. **Total:** 29 species; 102 territorial males or females ($878/\text{km}^2$, 355 per 100 acres). **Remarks:** The Ovenbird population was exceptionally high; the Cardinal population was exceptionally low. Three nests were found. Whip-poor-will, 2; Rufous-sided Towhee, 1. Carolina Chickadee fledglings were observed. Amphibians — Am. Toad, Fowler's Toad. Reptiles — Black Rat Snake, N. Black Racer, E. Box Turtle. Mammals — Shorttail Shrew, E. Mole, Raccoon, Red Fox, Gray Fox, E. Gray Squirrel, White-footed Mouse, Pine Vole, Whitetail Deer, feral dog. — M. KATHLEEN KLIMKIEWICZ, *Douglas Point Field Station, Box 26, Nanjemoy, Md. 20662.*



Census 25. View of canopy, understory and ground cover.

26. OAK GUM-MIXED HARDWOOD FOREST. — **Location:** Maryland; Charles Co., Nanjemoy, Douglas Point Proposed Nuclear Power Generating Station (Plot 6), 1 mile S intersection of Route 224 and Liverpool Point Road, adjacent to the Potomac River; $38^\circ 26' \text{N}$, $77^\circ 15' \text{W}$, Nanjemoy Quadrangle, USGS. **Continuity:** New. **Size:** 11.6 ha = 28.7 acres (rectangle, 1000 x 1250 ft, surveyed using a 1.4 acre grid). **Description of Plot:** The dominant canopy trees are White Oak (*Quercus alba*) and Sweet Gum (*Liquidambar styraciflua*). Most prominent in the understory are Mountain Laurel (*Kalmia latifolia*), Greenbriar (*Smilax rotundifolia*), Highbush Blueberry (*Vaccinium corymbosum*). The ground cover is primarily Running Pine (*Lycopodium flabelliforme*) and Dangleberry (*Gaultheria procumbens*). A quantitative survey of the vegetation gave the following results: Trees 3 inches in diameter and over, based on six circular samples, 201/acre; total basal area 61.0 ft²/acres. 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]: White Oak, 51, 26, 36, 100; Sweet Gum, 34, 17, 19, 83; Spanish Oak (*Q. falcata*), 16, 8, 15, 50; Willow Oak (*Q. phellos*), 8, 3, 7, 33; Dead trees, 18, 9, 5, 67; Am. Beech (*Fagus grandifolia*), 11, 6, 4, 67; Black Gum (*Nyssa sylvatica*), 19, 10, 4, 83. Trees by diameter size class [figures after each give number of trees/acre, relative density (%), basal area in square ft/acre, relative dominance (%)]: A (3-6 in.) 112, 55, 11.2, 18; B (6-9 in.) 58, 29, 17.3, 28; C (9-15 in.) 24, 12, 19.2, 32; D (15-21 in.) 5, 2, 8.6, 14; E (21-27 in.) 2, 1, 5, 8. Shrub stems/acre: 36,833; ground cover 57%; canopy cover 93%; average canopy height 72 ft (range 60-87). **Edge:** Bordered on the north, east, and south by extensive forest of similar habitat. The western boundary is forested for several hundred yards before it meets Route 224. **Topography:** Essentially flat. **Elevation:** 80-85 ft. **Weather:** Exceptionally wet and cool throughout census period with a week of heavy rain in late June.



Census 26. Section of plot showing dense understory and canopy.

Coverage: May 19, 25 (2 trips), 26; June 4, 8, 24-25. All trips between 0620 and 1200 and 1415 and 1615 hours. Total man-hours: 24. **Census:** Rufous-sided Towhee, 19 (164, 66); Tufted Titmouse, 16 (138, 56); Red-eyed Vireo, 10.5 (90, 37); Ovenbird, 6 (52, 21); Acadian Flycatcher, 5.5 (47, 19); Red-bellied Woodpecker, 5 (43, 17); Blue Jay, 5; Carolina Chickadee, 5; Carolina Wren, 3.5 (30, 12); Mourning Dove, 3 (26, 10); Blue-gray Gnatcatcher, 3; Scarlet Tanager, 3; Cardinal, 3; Wood Thrush, 2.5; Whip-poor-will, 2; Downy Woodpecker, 2; E. Wood Pewee, 2; Black-and-white Warbler, 2; Pileated Woodpecker, 1.5; Com. Flicker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Brown Creeper, 1; Hooded Warbler, 1; Am. Redstart, 1; Com. Grackle, 1; Brown-headed Cowbird, 1; Yellow-billed Cuckoo, +; Gray Catbird, +; Am. Robin, +; Summer Tanager, +. **Total:** 31 species; 107.5 territorial males or females ($926/\text{km}^2$, 375 per 100 acres). **Remarks:** Species of special interest include Brown Creeper (the first So. Maryland nesting record). This plot is typical of areas, found throughout the western shore of Maryland, with small seepage areas and a dense well-developed ericaceous understory. This provided ample habitat for the very high Rufous-sided Towhee population. The Cardinal population was low and the Tufted Titmouse population was high. Nests found: Blue Jay, 4; Red-bellied Woodpecker, 2; Wood Thrush, 1; Com. Grackle, 1. Fledgling Carolina Chickadees and Am. Robins were observed. Amphibians — N. Dusky Salamander, Am. Toad, Fowler's Toad. Reptiles — E. Fence Lizard, Five-lined Skink. Mammals — E. Mole, Shorttail Shrew, Raccoon, E. Gray Squirrel, Whitefooted Mouse, Pine Vole, E. Cottontail, Whitetail Deer, feral dog, feral cat. — FRED P. BURGGRAF, PAUL M. MCKENZIE, and M. KATHLEEN KLIMKIEWICZ (compiler), *Douglas Point Field Station, Box 26, Nanjemoy, Md. 20662.*

27. 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; $39^{\circ}12'55''\text{N}$, $76^{\circ}54'40''\text{W}$, Clarksville Quadrangle, USGS. **Continuity:** Established 1971; 4 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. **Coverage:** May 26; June 17, 19, 21, 24, 29; July 4, 7. All 8 trips in early morning, starting within 30 minutes of sunrise. Total man-hours: 23. **Census:** Red-eyed Vireo, 14 (117, 47); Acadian Flycatcher, 8 (67, 27); Wood Thrush, 7.5 (63, 25); Cardinal, 7.5; Veery, 6 (50, 20); Gray Catbird, 5.5 (46, 19); Scarlet Tanager, 4 (33, 14); Downy Woodpecker, 3.5 (29, 12); Kentucky Warbler, 3 (25, 10); Hooded Warbler, 3; E. Wood Pewee, 2.5; Carolina Chickadee, 2.5; Rufous-sided Towhee, 2.5; Yellow-billed Cuckoo, 2; Tufted Titmouse, 2; Carolina Wren, 2; Brown-headed Cowbird, 2; Cerulean Warbler, 1.5; Red-bellied Woodpecker, 1; Black-and-white Warbler, 1; N. Parula, 1; Mourning Dove, 0.5; Blue Jay, 0.5; Louisiana Waterthrush, 0.5; Bobwhite, +; Com. Flicker, +; Hairy Woodpecker, +; Com. Crow, +; White-breasted Nuthatch, +; Blue-gray Gnatcatcher, +; White-eyed Vireo, +; Yellow-throated Vireo, +; Ovenbird, +; N. Oriole, +. **Total:** 34 species: 83.5 territorial males

($697/\text{km}^2$, 282 per 100 acres). **Remarks:** Although the total population of the plot has remained nearly identical during the past 3 years, there have been important changes in the abundance of several species. The Veery, which first nested on the plot in 1972, increased from 2 to 4 territories in 1973 and to 6 territories in 1974. During the same period, the Wood Thrush has also increased, from 4 to 7.5 territories, and the Gray Catbird from 2 to 5.5. There have been smaller increases in the E. Wood Pewee, 1 to 2.5, and the Scarlet Tanager, 2 to 4. From 1972 to 1974, the warbler population has decreased from 16 to 10 territories, with the greatest drop taking place in the Hooded Warbler (5.5 to 3). In addition to declines in the warbler family, 3 common species decreased by at least 2 territories between 1973 and 1974: Tufted Titmouse, Cardinal and Rufous-sided Towhee. Except for occasional light use by a few hikers, there has been no disturbance in this plot — CHANDLER S. ROBBINS. *Migratory Bird and Habitat Research Laboratory, U.S. Fish and Wildlife Service, Laurel, Md. 20811.*

28. MIXED UPLAND HABITAT. — **Location:** District of Columbia; the central third of Glover-Archbold Park, a long, narrow stream valley park in the northwest section. **Continuity:** Established 1960; 15 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 16, 24, 31; April 5, 7, 14 (2 trips), 21-22, 27-28; May 2, 5, 11, 19, 25; June 2, 9, 23, 30; July 14. Hours ranged from 0655 to 2030, with 17 in the A.M., and 5 in the P.M. (two trips on May 25, in morning and evening, by the same observer are counted as one coverage in the calculations). The 21 trips totaled 46.5 hours, and gave 17.5 complete coverages of the area, averaging 2.85 hours per coverage. **Weather:** Predominantly clear on 12 trips, and cloudy or rainy on 9. Temperatures ranged from 41° to 80° F. , with an average of 61° . **Census:** Cardinal, 25 (176, 71); Tufted Titmouse, 24 (169, 69); Veery, 18 (127, 51); Starling, 17 (120, 49); Carolina Wren, 11 (78, 31); Gray Catbird, 10 (71, 29); Blue Jay, 9 (64, 26); Carolina Chickadee, 9; Rufous-sided Towhee, 9; Com. Crow, 8 (56, 23); Red-bellied Woodpecker, 6 (42, 17); Downy Woodpecker, 5 (35, 14); Red-eyed Vireo, 5; Com. Flicker, 4 (28, 11); White-breasted Nuthatch, 2; Am. Redstart, 1.5; Bobwhite, 1; Mourning Dove, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Mockingbird, 1; Am. Robin, 1; Scarlet Tanager, 1; Great Crested Flycatcher, +; Wood Thrush, +; Louisiana Waterthrush, +. **Total:** 26 species; 170.5 territorial males, ($1,204/\text{km}^2$, 487 per 100 acres). **Remarks:** This year saw recent trends continue. The species count is the lowest yet, 1 fewer than 1973. The high was 45 in 1960, and most years have been above 30. Number of territorial males is up slightly, but must be compared with the high of 223 in 1971. Variations in coverage may account for some of the differences in total species, but the trend is consistently toward the same or higher levels of year-round residents, and fewer migratory species. There was an abrupt change in some species, and the lowest total for territorial males (150) in 1963 when the park was disturbed by a swath cut through for sewer construction. As the stream-bottoms have grown up since, some

species have recouped, but Am. Redstarts illustrate the pattern most dramatically. Once our commonest warbler, with a high of 15 pairs in 1961, they dropped to 7 after the sewer construction, came up to 10 the next year, and then have gone to 8.5, 9, 6, 5, 5, 4, 2, visitor, and 1.5 this year. In 1961 we had 6 nesting species of warblers, with 32 pairs. Over the years, 9 species of warblers have nested here; this year we are down to the Am Redstart, Louisiana Waterthrush +, and visitor status for the Ovenbird and N. Parula. Vireos are also down: Red-eyed Vireo was 10 in 1959, dropped to 6 in 1963, reached a high of 16 in 1968, and have dropped consistently since to the 5 this year. We had 4 Yellow-throated Vireos through 1963, but they dropped to + by 1967, and then visitor in 1968, and then no more. White-eyed Vireos have always been occasional nesters here, but none has been found since 1966. The two flycatchers follow a decline too: Acadian had 10 pairs in 1966, with an average of 9, but went to 4 in 1972, 1 in 1973, and this year just one record of a singing male during the nesting season. The Great Crested Flycatcher averaged 5 pairs until 1970, then their numbers have been 3, 3, 0, and now +. Woodpeckers keep a very steady population. Blue Jays have gradually increased, from 3 at the beginning to 9 the last three years. Tufted Titmouse reached its high this year, increasing consistently from their early average of 10. Carolina Wren is also thriving, with 11 this year after its high of 12 last year, coming up from 3 in 1967. Common Crow is also at its high, rising steadily from 1.5 to 8. And the Starling, which came up from 3 to a high of 25 in 1970 has dropped 17. The Wood Thrush-Veery ratio continues to show the Veeries among the commonest birds in the area, while the Wood Thrushes that once had 12 pairs (1961) dropped to +. This does not reflect the situation for the whole park, however, since three pairs were singing consistently just north of the census area, and another three were in residence farther up the park.

— SHIRLEY A. BRIGGS (compiler), MICHAEL HOFFMAN, PETER NULTY, JOSEPH B. and DOROTHY PHILLIPS, EDGAR SMITH, DONALD WEBER.

29. UPLAND OAK-HICKORY FOREST. — **Location:** Virginia; Fairfax Co., Dranesville District Park (formerly known as Burling Park), McLean, along Route 193 (Old Georgetown Pike), about $\frac{3}{4}$ mile W of Exit 13, Capital Beltway (Interstate 495); 38°57'N, 77°12'W, Falls Church Quadrangle, USGS. **Continuity:** Established 1973. Also see *Atl. Nat.* 27: 184, 1972. **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:** Generally clear throughout census period; light drizzle on one trip. Temperatures ranged from 45-83°. **Coverage:** April 7, 16, 25, 27; May 7-8, 16, 23; June 8-9, 14; July 5. Eight trips mostly between dawn and 0930; four between 1755 and 1950, EDT. Total man-hours: 22. **Census:** Red-eyed Vireo, 9.5 (86, 35); Carolina Chickadee, 6 (55, 22); Red-bellied Woodpecker, 5 (45, 18); Cardinal, 5; Tufted Titmouse, 4.5 (41, 17); E. Wood Pewee, 4 (36, 15); White-breasted Nuthatch, 4; Brown-headed Cowbird, 4; Downy Woodpecker, 3.5 (32, 13); Scarlet Tanager, 3.5; Hairy Woodpecker, 3 (27, 11); Blue Jay, 3; Carolina Wren,

2.5; Great Crested Flycatcher, 2; Wood Thrush, 2, Kentucky Warbler, 2; Com. Grackle, 2; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Acadian Flycatcher, 0.5; Louisiana Waterthrush, 0.5. **Total** 21 species; 68.5 territorial males or females (622/km², 252 per 100 acres). **Remarks:** All three Hairy Woodpecker nests were found. A young cowbird was observed being fed by a Wood Thrush on July 5. The lower count this year as compared with 1973 (when 89 territorial males or females of 25 species were recorded) is doubtless partly attributable to lesser time in the field (only 22 man-hours as against 46 last year). Nearly all species were reduced in numbers; the only ones more numerous in 1974 were the Hairy Woodpecker, Red-eyed Vireo and Brown-headed Cowbird. — JOHN B BAZUIN, JR., LOUIS CRAIG, VIRGINIA SEILING, ELAINE AND BRAD WHITMAN, ROBERT J WATSON (compiler), 2636 Marcy Road, Arlington, Va. 22207.

30. UPLAND TULIP-TREE-OAK FOREST. —

Location: Virginia; Fairfax Co., U.S. Geological Survey National Center, Reston; 38°56'45"N, 77°21'50"W, Vienna Quadrangle, USGS. **Continuity:** New. **Size** 20.6 ha = 50.9 acres. **Description of Plot:** See AB 28 701-2, 1974. The dominant canopy trees are Tulip-tree (*Liriodendron tulipifera*), White Oak (*Quercus alba*), and Red Maple (*Acer rubrum*). Species prominent in the understory are Highbush Blueberry (*Vaccinium corymbosum*), Flowering Dogwood (*Cornus florida*), viburnums, and saplings of the canopy trees, especially Tulip-tree, Red Maple, and Sour Gum (*Nyssa sylvatica*). The ground cover is mainly Partridgeberry (*Mitchella repens*), Low Blueberry (*Vaccinium vacillans*), and club-mosses (*Lycopodium spp.*) A quantitative survey of the vegetation gave the following results: trees 3 inches in diameter and over, based on 7 0.1-acre circular samples, 416/acre; total basal area, 244.7 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): Tulip-tree 151, 36, 48, 100; White Oak 62, 15, 13, 100; Red Maple 55, 13, 7, 86; Dead trees 25, 6, 3, 100; Black Oak (*Q. velutina*) 25, 6, 7, 86; Sour Gum 21, 5, 3, 86; S. Red Oak (*Q. falcata*) 15, 4, 4, 57; Chestnut Oak (*Q. prinus*) 11, 3, 3, 14; Pignut Hickory (*Carya glabra*) 10, 2, 1, 71. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance (%)): A (3-6 in.) 133, 32, 13.3, 5; B (6-9 in.) 108, 26, 32.3, 13; C (9-15 in.) 123, 30, 98.6, 40; D (15-21 in.) 46, 11, 83.2, 34; E (21-27 in.) 6, 1, 17.4, 7. Shrub stems/acre, 23,571; ground cover, 38%; canopy cover, 69%; average canopy height, 49 ft (range 38-60). **Weather:** Both spring and summer were extremely dry. **Coverage:** April 21, 23, May 1, 8, 23, 31; June 6-7, 11, 19; July 3. All trips between 0555 and 1100 or 1700 and 2030. Total man-hours: 14.7. **Census:** Red-eyed Vireo, 4 (19, 8); Ovenbird, 4; Blue Jay, 3 (15, 6); Carolina Chickadee, 3, Tufted Titmouse, 3; Carolina Wren, 3; Wood Thrush, 3; Worm-eating Warbler, 3; Cardinal 3; Red-bellied Woodpecker, 2; Great Crested Flycatcher, 2; Downy Woodpecker, 1; E. Wood Pewee, 1; White-breasted Nuthatch, 1; Gray Catbird, 1; E. Bluebird, 1; Starling,

1, Louisiana Waterthrush, 1; Brown-headed Cowbird, 1. **Total:** 19 species; 41 territorial males ($199/\text{km}^2$, 81 per 100 acres). **Remarks:** Nests located: E. Bluebird, 1; Worm-eating Warbler, 1; Cardinal, 1. We were surprised by the low number of territorial males, but presently have no explanation. We thank Clark Baker for assistance in plant identification. — JOAN WOODWARD and PAUL W. WOODWARD, 2433 Southgate Square, Reston, Va. 22091.

31. MIXED DECIDUOUS FOREST. — **Location:** North Carolina, Orange Co., 4.5 miles N of Chapel Hill on N.C. Highway 86; Duke Natural Area; $35^\circ 59' \text{N}$, $79^\circ 04' \text{W}$, Chapel Hill Quadrangle, USGS. **Continuity:** Established 1973. **Size:** 8.8 ha = 21.8 acres. **Description of Plot:** See AB 27: 1018-1019, 1973. **Weather:** Essentially normal throughout the period. **Coverage:** April 17-18, 22, 24, 28; May 6-9, 15, 25, 30; June 7, 18. All trips between 0530 and 1110 hours except for one 1630-1745. Total man-hours: 25. **Census:** Red-eyed Vireo, 12 (136, 55); Acadian Flycatcher, 8 (91, 37); Carolina Wren, 8; Wood Thrush, 6 (68, 28); Ovenbird, 5.5 (62, 25); Red-bellied Woodpecker, 3 (34, 14); Carolina Chickadee, 3; Tufted Titmouse, 3; Scarlet Tanager, 3; Cardinal, 3; Blue Jay, 2; N. Parula, 2; Louisiana Waterthrush, 2; Downy Woodpecker, 1.5; Yellow-throated Warbler, 1.5; Blue-gray Gnatcatcher, 1; Rufous-sided Towhee, 0.5; Com. Crow, +; Worm-eating Warbler, +; Pine Warbler, +; Kentucky Warbler, +. **Total:** 21 species; 65 territorial males ($737/\text{km}^2$, 298 per 100 acres). **Remarks:** No nests located. Among the more numerous species, Acadian Flycatcher and Wood Thrush decreased from 11 and 8.5 territorial males, respectively, while Red-eyed Vireos and Ovenbirds increased from 10 and 3. Overall, the number of territorial males remained about constant (67 in 1973), which is not surprising considering the near total lack of disturbance in the area. The continued absence of several species which breed rather commonly in the general area remains perplexing; these include Great Crested Flycatcher, E. Wood Pewee and Am. Redstart. The rather high density of Scarlet Tanagers is notable; Summer Tanagers, generally more numerous as breeders in this part of North Carolina, apparently prefer areas with a greater abundance of pines than is found here. — NORMAN BUDNITZ, DAVID MORRIS, SEBASTIAN PATTI and ROBERT S. RIDGELY (compiler), Dept. of Zoology, Duke University, Durham, N.C. 27706.

32. MIXED MARITIME AND SWAMP FOREST. — **Location:** North Carolina; Carteret Co., Roosevelt Natural Area on Bogue Bank; $34^\circ 41' 45'' \text{N}$, $76^\circ 49' 45'' \text{W}$, Mansfield Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 25 acres (rectangular, 1100 by 990 ft, measured with a hand compass and tape. Short axis crossed by transects at 200 ft intervals and marked at 100 ft intervals). **Description of Plot:** Contains an alternating pattern of old dune ridges (elevation of crest 10-15 ft) and swales (elevation about 2 ft) that lie E-W. The plot (long axis lies N-S) contains a complete cross section of two ridges and two swales plus the north half of another (the southernmost) ridge. The ridges are covered with maritime forest and the swales contain swamp forest. Another distinctive community, perhaps best called

woodland thicket, occurs along the ridge-swale borders and on small islands in the swales. The plot was mapped on graph paper and acreages of the three communities were calculated. They are maritime forest, 14.6 acres, swamp forest, 8.5 acres; woodland thicket, 1.9 acres. A plant analysis was made by the 0.1 acre circular plot, as described by James and Shugart, for each of the three communities and is summarized as follows: **Maritime Forest:** Major canopy species are Laurel Tak (*Quercus laurifolia*) and Loblolly Pine (*Pinus taeda*). Trees 3 inches diameter and over, based on 9 circular samples (3 on each ridge), 374/acre; total basal area $89.1 \text{ ft}^2/\text{acre}$. Tree species (figures after each give number of trees/acre, relative density (%), relative dominance, frequency, in that sequence): Ironwood (*Carpinus caroliniana*), 72, 19.3, 7.1, 88.9; Red Cedar (*Juniperus virginiana*), 61, 16.3, 10.8, 88.9; Am. Holly (*Ilex opaca*), 46, 12.3, 7.8, 100; Red Bay (*Persea borbonia*), 43, 11.5, 10.0, 88.9; Laurel Oak, 42, 11.2, 23.1, 100, Am. Olive (*Osmanthus americanus*), 33, 8.8, 3.6, 100, dead trees (mostly Red Cedar), 31, 8.3, 5.3, 100; Loblolly Pine, 21, 5.6, 141, 100; Dogwood (*Cornus florida*), 10, 2.7, 2.9, 44.4; Live Oak (*Quercus virginiana*), 8, 2.1, 14.6, 33.3; Sparkleberry (*Vaccinium arboreum*), 7, 1.9, 0.8, 22.2. 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.) 241, 65.0, 19.9, 23.3; B (6-9 in.) 85, 22.9, 21.0, 24.6, C (9-15 in.) 32, 8.6, 18.9, 22.1; D (15-21 in.) 12, 3.2, 18.2, 21.3. Shrub stems/acre: 9444; ground cover 49%, canopy cover 95%; average canopy height 35 ft. Major shrub stems are young Laurel Oak, young Ironwood, and young Red Bay. Major ground cover species are Poison Ivy (*Rhus radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), Partridgeberry (*Mitchella repens*), Huckleberry (*Gaultheria procumbens*), and seedling Red Bays and Laurel Oaks. **Swamp Forest:** The major canopy species is Red Ash (*Fraxinus tomentosa*). Trees 3 inches diameter and over based on six circular samples (three in each swale), 273/acre; total basal area $80.0 \text{ ft}^2/\text{acre}$. Species comprising 94% of the total number of trees: Red Ash, 153, 56.0, 84.1, 100; Wax Myrtle (*Myrica cerifera*), 51, 18.7, 4.8, 100; Red Bay, 30, 11.0, 3.6, 100; Red Maple (*Acer rubrum*), 23, 8.4, 3.4, 50. Trees by diameter size class: A (3-6 in.) 187, 69.5, 14.2, 18.5; B (6-9 in.) 36, 13.4, 8.9, 11.6; C (9-15 in.) 31, 11.5, 21.4, 28.0; D (15-21 in.) 12, 4.5, 19.5, 25.5. Shrub stems/acre: 9367; ground cover 65%; canopy cover 86%; average canopy height 35 ft. Major shrub stems are Wax Myrtle and young Red Ash. Major cover plants are Lizard's Tail (*Saururus cernuus*), Water Willow (*Decodon verticillatus*), Arrow Arum (*Peltandra virginica*). **Woodland Thicket:** The major canopy species are Live Oak and Red Bay. This community is ecotonal and was wide enough to be sampled in only one area. Trees 3 inches diameter and over based on one circular sample, 300/acre; total basal area $71.9 \text{ ft}^2/\text{acre}$. Tree species: Red Bay, 100, 33.3, 23.9; Am. Olive, 70, 23.3, 15.2; Holly, 70, 23.3, 12.4, Dead trees, 20, 6.7, 25.6; Red Maple, 20, 6.7, 3.1; Live Oak, 10, 3.3, 17.1; Wax Myrtle, 10, 3.3, 2.7. Trees by diameter size class: A (3-6 in.) 190, 63.3, 15.5, 21.5, B (6-9 in.) 70, 23.3, 17.4, 24.2; C (9-15 in.) 20, 6.7, 11.0, 15.3; D (15-21 in.) 20, 6.7, 28.0, 39.0. Shrub stems/acre 9600 (there was a considerably greater number of

woody stems below chest high); ground cover 85%; canopy cover 65%; canopy height 25 ft. Major shrub stems are young Red Bay and Am. Olive. Major cover species are Poison Ivy, Fetterbush (*Lyonia lucida*), very small Red Bay. **Edge:** Alternating ridge-swale pattern continues in all directions. **Weather:** Generally moderate. However, on June 27, an intense low pressure system moved through the area, dropping 3.15 inches of rain and causing winds in excess of 50 knots. All censuses were conducted when winds were less than 10 knots. **Coverage:** May 17-18, 20-22, 29, 31; June 3, 5, 9-10, 13, 18, 29, all between 0600 and 1300 hours, most between 0600 and 1100 hours, EDST. Total man-hours: 44. **Census:** Cardinal, 11.5 (114, 46); Carolina Wren, 9.5 (94, 38); Prothonotary Warbler, 6.5 (64, 26); White-eyed Vireo, 4 (40, 16); Yellow-billed Cuckoo, 3 (30, 12); Great Crested Flycatcher, 2; Red-eyed Vireo, 2, Black-throated Green Warbler, 2; Rufous-sided Towhee, 1; Red-shouldered Hawk, +; Red-bellied Woodpecker, +. **Total:** 11 species; 41.5 territorial males (410/km², 166 per 100 acres). **Remarks:** Two Cardinal nests were found. Although Black-throated Green Warblers appeared to be nesting, none were seen in the areas after June 12. The low diversity of nesting birds in the area is especially evident in the southernmost 4.8 acres, on the ridge closest to the ocean where the effect of salt spray is evident. The forest here has little structural diversity and only two species were found; Carolina Wren and Cardinal. This census was part of an ecological survey of the Roosevelt Natural Area conducted for the Division of State Parks of N.C. Department of Natural and Economic Resources. —JOHN O. FUSSELL III, Box 520, Morehead City, N.C. 28557.

33. UPLAND MIXED FOREST. — North Carolina Wilkes Co., 0.25 mile from North Wilkesboro, just W of Finley Park. **Continuity:** Established 1954; 21 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 16, 27; June 3, 7, 10, 17. Hours varied from 0930 to 1700. **Census:** Cardinal, 8 (53, 22); Wood Thrush, 7 (47, 19), Rufous-sided Towhee, 6 (40, 16); Carolina Wren, 5 (33, 14), Mourning Dove, 3 (20, 8); Com. Flicker, 3; Acadian Flycatcher, 3; Blue Jay, 3; Tufted Titmouse, 3; Am. Robin, 3; Red-eyed Vireo, 3; Iom. Grackle, 3; Scarlet Tanager, 3; Red-bellied Woodpecker, 2; Kentucky Warbler, 2; Yellow-billed Cuckoo, 1; Screech Owl, 1; Barred Owl, 1; Downy Woodpecker, 1; Com. Crow, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Mockingbird, 1; Gray Catbird, 1; Brown Thrasher, 1; Yellow-throated Warbler, 1; Ovenbird, 1; Song Sparrow, 1. **Total:** 28 species; 70 territorial males (467/km², 189 per 100 acres). — WENDELL P. SMITH, North Wilkesboro, N.C. 28559.

34. 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; 6 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 mature forest cover in the last year. **Weather:** The local weather station recorded 95.56 inches of precipitation in 1973, and 49.31 inches

through July of this year. **Coverage:** March 3, 22-24, 27, 31; April 5, 7, 15, 17, 25, 28; May 1, 5, 8, 13, 16, 19, 24, 26, 29, 31; June 5, 9, 12, 15, 17, 19, 21, 23, 26, 30; July 3, 6. All trips between daybreak and 1000, EDT. Total man-hours: 52. **Census:** Red-eyed Vireo, 8 (134, 54); Hooded Warbler, 7 (118, 48); Acadian Flycatcher, 6 (101, 41); Cardinal, 5 (84, 34); Tufted Titmouse, 3 (50, 20); Worm-eating Warbler, 3; Great Crested Flycatcher, 2; Blue Jay, 2; Carolina Chickadee, 2, Carolina Wren, 2; Wood Thrush, 2; Black-and-white Warbler, 2; Black-throated Green Warbler, 2; Scarlet Tanager, 2; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1. **Total** 19 species; 53 territorial males (891/km², 361 per 100 acres). **Remarks:** Swainson's Warbler, called a breeding species the 5 preceding census years, was noted on 5 trips and considered a visitor. Ange Hinrichs, Caroline G. Newhall and Louis Schweizer assisted in one census each. — E. O. MELLINGER, *Tiger, Ga.* 30576.

35. 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; 5 intermittent years. **Size:** 20 ha = 49.4 acres. **Description of Plot:** See AB 25:993, 1971. **Coverage:** May 26; June 4, 6, 8-9, 13-16, 18, 22, 29, July 1, 4. All trips between 0530 and 0900 hours except 3. **Total man-hours:** 38. **Weather:** 50° to 75°. Sunny, to June 15; cool and wet to June 29; July sunny, warm. **Census:** Cardinal, 6 (30, 12); Am. Robin, 5 (25, 10), Indigo Bunting, 5; House Sparrow, 4 (20, 8); Com. Grackle, 4; Downy Woodpecker, 3 (15, 6); Blue Jay, 3, Great Crested Flycatcher, 2; Wood Thrush, 2; Starling, 2; N. Oriole, 2; Song Sparrow, 2; Mourning Dove, 1, E. Wood Pewee, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Red-eyed Vireo, 1; Red-winged Blackbird, 1; Brown-headed Cowbird, 1; Rose-breasted Grosbeak, 1. **Total:** 20 species; 48 territorial males (240/km², 97 per 100 acres). **Remarks:** While the total density of species was slightly below last year — 48 to 54 territorial males — the number of species increased from 17 to 20. The decrease in numbers was mostly in the insectivorous species, *i.e.* Black-billed Cuckoo, E. Wood Pewee, Great Crested Flycatcher. This I attribute to the weather. The first part of June averagee sunny and warm, but from the 13th to July 1 it was cloudy, rainy and cool. The loss of two Song Sparrow territories was owing to increased disturbance. Over a four-year period we seem to have had a shift away from the shyer woodland birds (Gray Catbird, Wood Thrush) to the more city-adapted species (House Sparrow, Starling) — DONALD PACE and ERIC NASMITH (compiler), 37 Pears Avenue, Toronto, Ontario M5R 1S9, Canada

36. MATURE MIXED HARDWOOD FOREST. — **Location:** Michigan; Oakland Co.; city of Southfield Civic Center Nature Area, entrance off Evergreen Rd at Civic Center Dr.; 42°30'N, 83°15'W, Royal Oak Quadrangle, USGS. **Continuity:** New. **Size:** 9.3 ha = 23 acres (rectangular, surveyed with compass and steel tape). **Description of Plot:** The dominant canopy trees are Am. Beech (*Fagus grandifolia*) and White Ash (*Fraxinus americana*). The understory consists mainly of young Beech; the ground cover is Wild Geranium

(*Geranium maculatum*), May-apple (*Podophyllum peltatum*), and Trout Lily (*Erythronium americanum*). A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, based on six 1/10-acre circular samples: 306 per acre; total basal area 159.2 ft² per acre. Species comprising 90% of total number of trees: Am. Beech, 62, 20, 13, 80; White Ash, 34, 11, 12, 100; Sugar Maple (*Acer saccharum*), 24, 8, 6, 100; Bitternut Hickory (*Carya cordiformis*), 18, 6, 4, 100; Shagbark Hickory (*C. ovata*), 16, 6, 3, 80; Red Maple (*A. rubrum*), 12, 4, 6, 60; Swamp White Oak (*Quercus bicolor*), 12, 4, 8, 20; Am. Basswood (*Tilia americana*), 10, 3, 4, 60; dead trees, 108, 36, 37, 100. Trees by diameter size class: A (3-6 in.) 98, 32, 9, 8, 6; B (6-9 in.) 94, 31, 28, 2, 18; C (9-15 in.) 84, 28, 67.2, 42; D (15-21 in.) 30, 10, 54.0, 34. Shrub stems per acre: 77,600; ground cover 60%; canopy cover 52%; average canopy height 93 ft. (range 85-100). This is basically a rectangular 35-acre unumbered remnant of a forest, bordered on the W by a man-made lake filled with run-off from a man-made hill. In an effort to reduce edge effect, only 23 acres were surveyed; however, the woods side of the pond was included. **Edge:** Bounded on the N and E by residential developments and on the S by a municipal golf course. An underground high-pressure crude oil pipeline was run through SW to NE about 1964, and a building is currently being constructed in the woods on the W. **Topography:** Flat. **Elevation:** 685.8 ft. **Weather:** Temperature ranged from 30°-70° F; on 1 census the wind velocity was approximately 18 mph, otherwise clear and calm. **Coverage:** April 3, 16, 23; May 1, 10, 22, 31; June 3, 7, 10, 14, 19, 21, 25; July 12. All trips between 0500 and 0900 or 2000 and 2200 hours. Total man-hours: 58, plus 50 hours for surveying and habitat description. **Census:** Starling, 11 (124, 50); Cardinal, 6.5 (70, 28); Song Sparrow, 6 (64, 26); Com. Flicker, 4.5 (48, 20); Ring-necked Pheasant, 4 (43, 17); Am. Robin, 3.5 (38, 15); Com. Crow, 3 (32, 13); House Wren, 3; Com. Grackle, 3; Red-headed Woodpecker, 2; Downy Woodpecker, 2; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Gray Catbird, 2; Wood Thrush, 2; Blue Jay, 1.5; Red-eyed Vireo, 1.5; Canada Goose, 1; Mallard, 1; Hairy Woodpecker, 1; Tufted Titmouse, 1; White-breasted Nuthatch, 1; Red-winged Blackbird, 1; Indigo Bunting, 1; Am. Goldfinch, 1; Spotted Sandpiper, +. **Total:** 27 species; 66 territorial males (709/km², 287 per 100 acres). **Remarks:** Nests located were 2 Com. Crow; 1 Canada Goose; 1 Blue Jay; 1 Tufted Titmouse; 1 Cardinal; and several Starling. Two female Mallards were seen, each with 5 downy young; 2 young Red-headed Woodpeckers were also noted. Mammals seen were 4 Raccoons with a total of 7 young; E. Fox Squirrel; E. Cottontail; Opossum and Muskrat. Also observed were 2 E. Ribbon Snakes and 1 E. Garter Snake. We express our appreciation for the cooperation and support received from the Southfield Civic Center. — **BETTY CHALLIS** (compiler), *Oakland Audubon Society, 2335 Pontiac Lk. Rd., Pontiac, Mich. 48054.*

37. MIXED HARDWOOD FOREST.—Location: Michigan; Washtenaw Co., 3 miles S of Ann Arbor, on the N side of Morgan Road, 1/4 mile W of the intersection of Morgan and Stone School Roads. **Continuity:** Established, 1966; 9 consecutive years. **Size:** 7.2 ha =

17.8 acres (rectangular 430 x 200 yards, paced) **Description of Plot:** See AFN 20:612, 1966. **Coverage:** March 7, 31; April 7, 10, 14, 16, 20-21, 25, 27; May 3, 6-7, 11, 21, 23, 25-27; June 1-2, 23; July 20. Hours varied from 0530 to 2145, totaling about 48 party-hours. **Census:** Red-eyed Vireo, 4 (56, 22); Com. Flicker, 3.5 (49, 20); E. Wood Pewee, 3.5; Wood Thrush, 3 (42, 17); Cardinal, 3; Downy Woodpecker, 2.5; Blue Jay, 2.5; Rufous-sided Towhee, 2.5; Red-bellied Woodpecker, 2; Hairy Woodpecker, 2; Acadian Flycatcher, 2; Tufted Titmouse, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Starling, 2; Com. Grackle, 2; Wood Duck, 1; Screech Owl, 1; Red-headed Woodpecker, 1; Great Crested Flycatcher, 1; Com. Crow, 1; Ovenbird, 1; Scarlet Tanager, 1; Indigo Bunting, 1; Gray Catbird, 0.5; Red-tailed Hawk, +; Rose-breasted Grosbeak, +; Field Sparrow, +; Song Sparrow, +. **Total:** 29 species; 49 territorial males (680, 275). **Remarks:** Nests found: Red-bellied Woodpecker, Red-headed Woodpecker, Gray Catbird, Red-eyed Vireo, 2. As in the rest of the Midwest, this has been an exceedingly dry summer, and the potholes did not hold as much water as long as in the past. This substantially reduced the mosquito population. Morgan Woods is located about a mile from the Ann Arbor Municipal Airport (private and light cargo planes), and is under an approach to the airport, but this year there seemed to be much less noise interference from overflying planes. —JOHN CHEEK, JANET DOWNS, JIM FREDERICK, JANICE JOHNSON (compiler), JOHN RASCHE, DUANE RORABACHER, JUDY SCHMIDT, DOUG WOODBY, *Washtenaw Audubon Society, 130 North Clubview Drive, Ypsilanti, Mich 48197.*

38. OAK-MAPLE FOREST AND EDGE. —
Location: Illinois, Champaign Co., Trelease Woods, 6 miles NE of Champaign. **Continuity:** Established 1941, 31 intermittent years. **Size:** 22.26 = 55 acres (rectangular, survey) plus 2.0 km = 1.25 miles of forest-edge. **Description of Plot:** See AFN 2: 232-233, 1948. **Coverage:** April 5, 11, 19, 24, 29; May 4, 10, 17, 31; June 12, 17, 25; July 5, 24. All trips between 0700 and 1115 hours. Total man-hours: 76. The density of the forest-interior species has been calculated as the number of territorial males per square kilometer and 100 acres, the density of the forest-edge species as the number per kilometer and mile. **Census:** *Forest-interior Species* House Wren, 12 (54, 22); Downy Woodpecker, 6 (27, 11); E. Wood Pewee, 5 (22, 9); Great Crested Flycatcher, 4 (18, 7); Yellow-billed Cuckoo, 3 (13, 5), Red-bellied Woodpecker, 3; Wood Thrush, 3; Red-eyed Vireo, 3; Am. Woodcock, 1; Great Horned Owl, 1; Hairy Woodpecker, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Carolina Wren, 1 *Forest-edge Species:* Starling, 64 (32, 51); Am. Robin, 23 (12, 18); Blue Jay, 16 (8, 13); Com. Flicker, 13 (6, 10), Indigo Bunting, 9 (4, 7); Mourning Dove, 8 (4, 6); Red-headed Woodpecker, 8; Com. Yellowthroat, 6 (3, 5), Cardinal, 6; Field Sparrow, 6; Rufous-sided Towhee, 3 (2, 2); Brown Thrasher, 2; Am. Goldfinch, 2; Red-tailed Hawk, 1; N. Oriole, 1. **Total:** 14 species in forest-interior; 45 territorial males (202/km², 82 per 100 acres), 15 species in forest-edge; 168 territorial males (84/km, 134 per mile). **Remarks:** The House Wren which had declined progressively in numbers over several years to

a minimum of 5 territorial males in 1971 has since been increasing again, reaching 12 males in 1974. The robin has been increasing progressively from only an occasional bird before 1951 to a maximum this year of 23 territorial males. — S. CHARLES KENDEIGH and JOHN M. EDGINGTON, Vivarium Building, University of Illinois, Champaign, Ill. 61820.

39. BLACK OAK AND SASSAFRAS WOODS. — **Location:** Indiana; Porter Co., 1 mile E intersection of #49 and #12; 41°37'N, 87°2'W; NE/4 Porter 15' Quadrangle, USGS, within Indiana Dunes National Lakeshore park. Area crossed by tarred country road and new little-used bridle path. **Continuity:** New. **Size:** 22.22 ha = 55 acres (weighed map pieces). **Description of Plot:** Almost no canopy trees because of fire over study area 4/8/71. Clusters of 8 ft - 14 ft shoots surround each dead trunk making a dense-to-impenetrable understory over much of area. Fallen trunks impede walking. Ground cover primarily Lowbush Blueberry (*Vaccinium pensylvanicum*), Bracken (*Pteridium aquilinum*), a dwarf colonial Shadbush (*Amelanchier spicata?*), numerous Gramineae and at least 75 herbaceous flowering species. Quantitative survey of vegetation based on two circular samples of typical areas gave the following results: Trees 1-3 inches in diameter: 3385/acre. Standing dead trees 6-inches in diameter or larger: 155/acre. Largest dead tree 90-inches in circumference. Species comprising 90% of the total number of trees: Black Oak (*Quercus velutina*) 755/acre; Shadbush (*Amelanchier laevis*) 555/acre; Red-osier Dogwood (*Cornus stolonifera*) 520/acre; Sassafras (*Sassafras albidum*) 455/acre; Quaking Aspen (*Populus tremuloides*) 435/acre; Winged Sumac (*Rhus copallina*) 210/acre; White Oak (*Q. alba*) 110/acre; Witch Hazel (*Hamamelis virginiana*) 85/acre. Ground cover: 100%. **Edge:** Bordered by similar unburned areas. **Topography:** Low dunes area (from glacial Lake Chicago) with some open fields and a number of damp to wet spots. **Elevation:** 622-624 ft. **Weather:** Wet spring. **Coverage:** April 7, 14, 21, 27-28; May 18, 25-27; June 2, 8, 16, 22-23, 30; July 6-7, 13, 19-20. Majority of trips between dawn and 0900 hours. Total hours: 48. **Census:** Field Sparrow, 8 (36, 15); Com. Yellowthroat, 7 (31, 13); Rufous-sided Towhee, 6 (27, 11); Gray Catbird, 4 (18, 7); Brown Thrasher, 4; Com. Flicker, 3 (14, 5); House Wren, 3; Mourning Dove, 2; Red-headed Woodpecker, 2; Downy Woodpecker, 2; Cardinal, 2; E. Wood Pewee, 1; Black-capped Chickadee, 1; Blue-gray Gnatcatcher, 1; Cedar Waxwing, 1; Yellow-throated Vireo, 1; Song Sparrow, 1. **Total:** 19 species; 52 territories 234/km², 95 per 100 acres. **Remarks:** Only one nest located: flicker. Special thanks to Robert Tweit for assistance given. — EMMA B. PITCHER, 1159 E. 56th St., Chicago, Ill. 60637.

40. MIXED DECIDUOUS FOREST. — **Location:** Indiana: Jackson Co., Hoosier National Forest, 2 mi. S of Hickory Ridge Lookout Tower; 39°0'N, 86°19'W; Hoosier National Forest Map, United States Forest Service. **Continuity:** New. **Size:** 9.5 ha = 23.5 acres (surveyed with steel tape and compass). **Description of Plot:** A middle-aged forest, not cut in recent years. Area bisected by rocky bottomed, intermittent stream, Mose Ray Branch; several ravines branch from this main

stream to various parts of area. A quantitative survey of trees based on 5 circular plots totaling .899 acres gave the following results: Species comprising 85% of total number of trees: Sugar Maple (*Acer saccharum*), 23.7 ft²/acre, 149 trees/acre; Red Oak (*Quercus rubra*), 17.9, 20; Chestnut Oak (*Q. prinus*), 14.9, 23; White Oak (*Q. alba*), 12.1, 25; Sweet Pignut Hickory (*Carya ovalis*), 10.2, 21; Tulip-tree (*Liriodendron tulipifera*), 8.9, 8; Beech (*Fagus grandifolia*), 7.8, 41; Shagbark Hickory (*C. ovata*) 5.6, 16; Shumard Oak (*Q. shumardii*) 4.7, 3; Red Maple (*A. rubrum*), 3.7, 45; Flowering Dogwood (*Cornus florida*) 2.2, 56. Trees by diameter classes A (1-4 in.), 8.8 ft²/acre, 270 trees/acre; B (4-8 in.), 13.8, 71, C (8-12 in.), 36.0, 66; D (≥ 12 in.) 57.8, 53; stand totals, 116.4, 461. **Edge:** Bordered on the south by a stand of pines surrounding a foot trail and a small pond, on the north by similar forest and a stand of pines, on the east by Hickory Ridge Road, and on the west by similar forest. **Topography:** Steep sided ravines with rounded ridges. **Elevation:** 750-850 ft. **Weather:** Temperatures 47° - 67° F.; clear or cloudy, with light winds, except for one hard rain during counts. May and June were unusually rainy with June being rather cooler than usual during the last week. **Coverage:** May 31; June 6, 8, 19, 26, 29; July 6, 13. 8 trips between 0500 and 0830, one late evening count 2040 - 2150. Total man-hours: 43. **Census:** Red-eyed Vireo, 6.5 (68, 28); Acadian Flycatcher, 5 (53, 21); Ovenbird, 4 (42, 17); Tufted Titmouse, 3.5 (37, 15); Worm-eating Warbler, 3.5; Scarlet Tanager, 3.5; Cerulean Warbler, 3 (32, 13); E. Wood Pewee, 2.5; Wood Thrush, 2; Yellow-billed Cuckoo, 1.5; Downy Woodpecker, 1.5; Gray Catbird, 1.5; Cardinal, 1.5; Black-billed Cuckoo, 1; Red-bellied Woodpecker, 1; White-breasted Nuthatch, 1; Carolina Chickadee, 1; Hooded Warbler, 1; Brown-headed Cowbird, 1 (female); Indigo Bunting, 1; Rufous-sided Towhee, 1; Mourning Dove, 0.5; Whip-poor-will, 0.5; Great Crested Flycatcher, 0.5; Prairie Warbler, 0.5; Kentucky Warbler, 0.5; Broad-winged Hawk, +; Chipping Sparrow, +. **Total:** 27 species; 49 territorial males or females (515/km², 209 per 100 acres) **Remarks:** One Ovenbird nest containing 3 eggs was found. — RANDALL CROOKE and J. DAN WEBSTER, Hanover College, Hanover, Ind. 47243.

41. MIXED DECIDUOUS FOREST (B). — **Location:** Indiana: Monroe Co., Hoosier National Forest, 1.5 mi WSW of Hickory Ridge Lookout Tower; 39°02'N, 86°21'W; Hoosier National Forest Map, United States Forest Service. **Continuity:** New. **Size:** 9.9 ha = 24.3 acres (surveyed with steel tape and compass) **Description of Plot:** A middle-aged forest not cut in recent years. Area bordered on SE corner by rocky, intermittent stream that has branches extending up through middle of area; 2 trails extend along the N and W sides of area on ridges. A quantitative survey of trees based on 5 circular plots totaling .899 acres gave the following results: Species comprising 83% of total number of trees: Chestnut Oak (*Quercus prinus*), 41.1 ft²/acre, 89 trees/acre; Red Oak (*Q. rubra*), 17.1, 20, White Oak (*Q. alba*), 14.0, 19; Sassafras (*Sassafras albidum*), 7.1, 77; Tulip-tree (*Liriodendron tulipifera*), 7.0, 11; Flowering Dogwood (*Cornus florida*), 5.1, 141; Persimmon (*Diospyros virginiana*), 4.9, 63; Sweet Pignut Hickory (*Carya ovalis*), 4.0, 7. Trees by diameter

classes; A (1-4 in.), 12.0 ft²/acre, 357 trees/acre; B (4-8 in.), 13.3, 69; C(8-12 in.), 30.9, 57; D(> 12 in.), 55.3, 49; stand totals, 111.5, 531. **Edge:** Bordered on part of north line by a stand of small pines overtopped by similar forest, on the west by a small pond and ravine in similar forest, on the east, south, and part of north by similar forest. **Topography:** Rounded ridges with fairly steep-sided ravines. **Elevation:** 780 - 830 ft. **Weather:** 47° - 70° F, clear or cloudy, light winds. Many counts were preceded by hard rains during the night, but no rain fell during a count. May and June were unusually rainy with June being rather cooler than usual during the last week. **Coverage:** May 29; June 5, 7, 17, 20, 27; July 5, 14 - 8 trips between 0500 and 0845, one late evening count 2055 - 2150. Total man-hours: 45. **Census:** Ovenbird, 4.5 (46, 19); Red-eyed Vireo, 4 (41, 16); Acadian Flycatcher, 3 (31, 12); E. Wood Pewee, 3; Hooded Warbler, 3; Red-bellied Woodpecker, 2.5; Downy Woodpecker, 2.5; Tufted Titmouse, 2.5; Wood Thrush, 2.5; Worm-eating Warbler, 2; Cerulean Warbler, 2; White-breasted Nuthatch, 1.5; Scarlet Tanager, 1.5; Cardinal, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Carolina Chickadee, 1; Blue-gray Gnatcatcher, 1; Brown-headed Cowbird, 1 (female); Rufous-sided Towhee, 1; Pileated Woodpecker, 0.5; Yellow-throated Vireo, 0.5; Kentucky Warbler, 0.5; Summer Tanager, 0.5; Screech Owl, +; Whip-poor-will, +; Indigo Bunting, +. **Total:** 29 species; 46.5 territorial males or females (473/km², 191 per 100 acres). — RANDALL CROOKE and J. DAN WEBSTER, *Hanover College, Hanover, Ind.* 47243.

42. POORLY DRAINED MIXED OAK FOREST. —**Location:** Indiana, Newton Co., Willow Slough Fish and Wildlife Area, 4.5 miles NW of Morocco; 40°59'22"N, 87°31'09"W, Donovan, Ill.-Ind., Quadrangle, USGS. **Continuity:** New Size: 11.07 ha = 27.36 acres (rectangular, 1700' x 700'; surveyed with a handheld compass and measured tape). **Description of Plot:** Trees 3 inches diameter and over, based on six randomly selected 0.1 acre circular samples, 223/acre; total basal area, 112.5 ft², comprising 96% of the total number of trees (figures after each give number of the trees/acre, relative density (%), relative dominance, frequency, in that sequence): Pin Oak (*Quercus palustris*) 117, 52, 65, 83; Black Oak (*Q. velutina*) 63, 28, 24, 50; White Oak (*Q. alba*) 18, 8, 7, 33. Trees by diameter size class (figures after each class give number of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (3-6 in.) 65, 29.1, 6.5, 5, 8, B (6-9 in.) 62, 27.6, 18.5, 16.4; C (9-15 in.) 92, 41, 73.3, 65.2; D (15-21 in.) 3.3, 1.5, 6.0, 5.3; F (27-33 in.) 1.7, 0.7, 8.2, 7.3. Shrub stems/acre: 112, 666; ground cover 56%; canopy cover 84%; average canopy height 56 ft. (range 48-65 ft.). The soil is sandy and drains fast. The water table is kept artificially high by fall and winter flooding of a nearby goose management area, but is usually gone by late June. There are three general plant communities depending on the elevation. The lowest area in the western corner, a five acre marsh, consists of an unidentified clumped grass about 3 ft. high. The next level up drains faster and is Pin Oak forest, edged by Black Chokeberry (*Pyrus melanocarpa*). The Black Oak and White Oak area is

always dry. The understory in this area is sparse grass on the crowns of higher area. Blueberry (*Vaccinium* sp.) can be found in intermediate areas. **Edge:** Similar habitat on all sides other than western corner, which opens into a marsh to the west and east; five acres of the marsh penetrates the plot. **Topography:** Essentially flat with general fall to the west. **Elevation:** 652-660 ft. **Weather:** May and June were unusually wet with many windy and cloudy days. July was clear and unusually dry. **Coverage:** May 25; June 15, 21, 23, 29-30; most between dawn and 1000; one from 1030-1400, another from 1950-2050. Weather disrupted several others. Total man-hours: 13 hours censusing and 15 hours surveying, laying out the grid and taking 0.1 acre circular samples. **Census:** Com. Yellowthroat, 6 (54, 22); E. Wood Pewee, 4.5 (41, 16); Veery, 4 (36, 15); N. Oriole, 4; Rufous-sided Towhee, 4; Com. Flicker, 3 (27, 11); Downy Woodpecker, 3; Blue Jay, 3; Tufted Titmouse, 3; Cardinal, 3; Song Sparrow, 3; Great Crested Flycatcher, 2.5; Gray Catbird, 2.5; Scarlet Tanager, 2; Red-eyed Vireo, 2; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Com. Crow, 1; Brown Thrasher, 1; Brown-headed Cowbird, 1; Swamp Sparrow, 1. **Total:** 21 species; 55.5 territorial males or females (501/km², 203 per 100 acres). **Remarks:** A Com. Crow and a Red-eyed Vireo nest were found. — EDWARD M. HOPKINS, *1150 Windsor Drive, W Lafayette, Ind.* 7906.

43. MATURE OAK-HICKORY WOODLOT. —**Location:** Ohio; Sandusky Co., 2.5 miles SW of White's Landing, near junction of Pickerel Creek and Route 6, 41°24'48"N, 82°57'20"W, Vickery Quadrangle, USGS. **Continuity:** New. **Size:** 8.09 ha = 20 acres (irregular, planimetered from a 1 inch = 300 ft aerial photo) **Description of Plot:** Part of a 31.8-acre woodlot, lightly grazed in 1973. The northern and western portion of the woodlot were omitted owing to frequent seiche activity of Lake Erie. The dominant canopy trees are Bur Oak (*Quercus macrocarpa*) and Shagbark Hickory (*Carya ovata*). Most prominent in the understory are hawthorn (*Crataegus* spp.), Rough-leaved Dogwood (*Cornus drummondii*), and Shagbark Hickory. The ground cover is mainly sedges (*Carex* spp.) [including Lake Sedge (*Carex lacustris*)], and Poison Ivy (*Rhus radicans*). A quantitative survey of the vegetation gave the following results: Trees 3-inches diameter and over, based on five circular samples, 140/acre; total basal area 149.8 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]: Shagbark Hickory, 68, 49, 23, 100; Bur Oak, 24, 17, 36, 80; White Oak (*Q. alba*), 12, 9, 8, 40; Chestnut Oak (*Q. prinus*), 8, 6, 7, 40; Ohio Buckeye (*Aesculus glabra*), 8, 6, 1, 20; Pin Oak (*Q. palustris*), 6, 4, 9, 60. Trees by diameter size class (figures after each class give number of tree/acre, relative density (%), basal area in ft²/acre, relative dominance): A (3-6 in.) 26, 19, 2.6, 2; B (6-9 in.) 30, 21, 9.0, 6; C (9-15 in.) 42, 30, 33.6, 21; D (15-21 in.) 24, 17, 43.2, 28; E (21-27 in.) 16, 11, 49.6, 33; F (27-33 in.) 2, 1, 9.8, 7. Shrub stems/acre 107,400; ground cover 91%; canopy cover 64%; average canopy height 34 ft. (range 30-40). **Edge:** Bordered on north and east by 15-to 20-ft-wide strip of hawthorn. Bordered on south and west by oxbows and channel of



Census 43. View of woodlot looking southwest from the powerline right-of-way.

Pickerel Creek. The northern 15% is separated from the southern portion by a freshly cleared powerline right-of-way. **Topography:** Essentially flat. **Elevation:** 575 ft. **Weather:** Warm, with light winds, and a moderate amount of rain throughout period. **Coverage:** June 19-21, 24-28; 8 trips between dawn and 0830, and 1 between 2009 and 2140 hours. Total man-hours: 20.4. **Census:** E. Wood Pewee, 7 (87, 35); Indigo Bunting, 7; Great Crested Flycatcher, 5 (62, 25); Acadian Flycatcher, 5 (62, 25); Red-eyed Vireo, 5; Cardinal, 5; Mourning Dove, 3 (37, 15); Am. Robin, 3; Rufous-sided Towhee, 3; Field Sparrow, 3; Song Sparrow, 3; Tufted Titmouse, 2; Gray Catbird, 2; Brown-headed Cowbird, 2 (females); Yellow-billed Cuckoo, 1; Com. Flicker, 1; House Wren, 1; Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; Yellow Warbler, 1; Red-headed Woodpecker, 0.5. **Total:** 24 species; 64 territorial males or females ($791/\text{km}^2$, 320 per 100 acres). **Remarks:** Six nests were located: Acadian Flycatcher, 1; E. Wood Pewee, 1; Blue-gray Gnatcatcher, 1; Yellow-throated Vireo, 1; and Red-eyed Vireo, 2. Two immature Great Horned Owls were observed, but no adults were heard or seen. E. Garter Snake, Black Rat Snake, Bats, Striped Skunk, E. Fox Squirrel, White-footed Mouse, Meadow Vole, Muskrat, E. Cottontail, and White-tailed Deer. Fox tracks have also been observed. Research was sponsored by the Am. Electric Power Service Corp. Special thanks to Steven E. Pomeroy for assistance in vegetation sampling, and reptile and mammal observations. — DUANE A. TOLLE, Battelle, Columbus Laboratories, 505 King Avenue, Columbus, Ohio 43201.

44. VIRGIN BEECH-MAPLE FOREST. — **Location:** Ohio; Preble Co., Hueston Woods State Park, 4 miles N of Oxford near the intersection of Brown and Main Loop Roads; E $\frac{1}{2}$ of the SE $\frac{1}{4}$ of section 34, T 6 N, R 1 E, College Corner Quadrangle, USGS. **Continuity:** Established 1973. **Size:** 6.1 ha = 15.1 acres (1045 x 625 ft rectangle, measured with steel tape, transit, and compass and permanently marked). **Description of Plot:** Part of a state nature preserve which receives many visitors. The forest is a virgin stand of

beech and maple with a main canopy 150-175 ft high and an understory of shrubs 6-8 ft high. Openings in the main canopy are infrequent. Sugar Maple (*Acer saccharum*) and Am. Beech (*Fagus grandifolia*) occurred in greatest density, frequency and size while White Ash (*Fraxinus americana*) and Tulip-tree (*Liriodendron tulipifera*) were also present and Spicebush (*Lindera benzoin*) was prevalent in the sub-canopy. **Edge:** Situated to minimize edge effects. One 1045 ft side and one 625 ft side are bordered by continuous beech-maple woods. The other 625 ft side is bordered by beech-maple woods and Acton Lake. A park road and golf course border a narrow beech-maple buffer zone on the other 1045 ft side. **Topography:** A flat upland surface with a dissected descending slope which gradually levels off. The area is Russell silt loam and part of the Wisconsin till plain. **Elevation:** 1000 ft.

1973. **Coverage:** April 25-June 29; 2 mornings per week, total 53 man-hours. **Census:** Red-eyed Vireo, 13 (213, 86); Acadian Flycatcher, 9.5 (156, 63); Blue-gray Gnatcatcher, 8.5 (139, 56); White-breasted Nuthatch, 6.5 (106, 43); Tufted Titmouse, 6 (98, 40); Cerulean Warbler, 6; E. Wood Pewee, 5.5 (90, 36); Carolina Chickadee, 5.5; Yellow-throated Vireo, 4.5 (73, 30); Cardinal, 4 (65, 26); Kentucky Warbler, 3.5 (57, 23); Red-bellied Woodpecker, 2.5; Ovenbird, 2.5; Red-headed Woodpecker, 2; Downy Woodpecker, 2; Louisiana Waterthrush, 2; Com. Flicker, 1.5; Great Crested Flycatcher, 1.5; Carolina Wren, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Blue Jay, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Black-billed Cuckoo, 0.5; Great Horned Owl, 0.5; Pileated Woodpecker, 0.5; Com. Crow, 0.5; Wood Thrush, 0.5; Starling, 0.5; Indigo Bunting, 0.5; Wood Duck, +; Barred Owl, +; Gray Catbird, +; Am. Robin, +; Prothonotary Warbler, +; Song Sparrow, +; Rufous-sided Towhee, +. **Total:** 38 species; 96.5 territorial males ($1580/\text{km}^2$, 639 per 100 acres). **Remarks:** This area of mature forest is one of the few virgin stands remaining in Ohio. The census is part of the author's Master's Degree thesis on file in the Miami University library, Oxford, Ohio, which analysed the bird communities of a mature, virgin forest and a comparable selectively cut forest. — DIANA L. ADAMS.

1974. **Weather:** Four days were completely overcast, 3 days partly cloudy, and 1 clear. Temperatures ranged from unseasonably cold (43°F) to average (63°F). Wind was a limiting factor on only one day. **Coverage:** May 3, 5-6, 10, 13, 15 (evening), 17, 19, and 20 (evening); 8 morning counts (0630-0900) and 2 evening counts, totaling 38 man-hours. **Census:** Acadian Flycatcher, 10.5 (172, 70); Blue-gray Gnatcatcher, 8 (131, 53); Red-eyed Vireo, 7.5 (123, 50); Tufted Titmouse, 7 (115, 46); Cardinal, 4 (65, 26); E. Wood Pewee, 3.5 (57, 23); Cerulean Warbler, 3.5; Red-bellied Woodpecker, 3 (49, 20); Carolina Chickadee, 3; Yellow-throated Vireo, 3; Ovenbird, 3; Indigo Bunting, 2.5; Red-headed Woodpecker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Kentucky Warbler, 2; Rufous-sided Towhee, 2; Carolina Wren, 1.5; Wood Thrush, 1.5; Mourning Dove, 1; Great Horned Owl, 1; Com. Flicker, 1; Downy Woodpecker, 1; Blue Jay, 1; Com. Crow, 1; Gray Catbird, 1; Starling, 1; Louisiana Waterthrush, 1; Brown-headed Cowbird, 1; Scarlet Tanager, 1; Barred Owl, 0.5; Ruby-throated

Hummingbird, 0.5; Pileated Woodpecker, 0.5; Wood Duck, +; Hairy Woodpecker, +; Song Sparrow, +. **Total:** 36 species; 84 territorial males ($1,375/\text{km}^2$, 556 per 100 acres). **Remarks:** The total number of territorial males present was less this year than last probably owing to the fact that the census was conducted only in May and not in May and June as in the previous year. Nest discoveries included Red-bellied Woodpecker (1). Red-headed Woodpecker (1), Tufted Titmouse (1), White-breasted Nuthatch (1), and Starling (1). A pair of adult Great Horned Owls and 2 juveniles were observed in April. An unseasonal cold snap slowed bird activity slightly. White-tailed Deer, Fox Squirrel, Striped Skunk, and Garter Snake were also seen. We are grateful to the Ohio Department of Natural Resources for permission to make this study. — STEVEN R. BEISINGER and DIANA L. ADAMS, *Miami University, Oxford, Ohio 45056.*

45. RIDGE AND VALLEY HARDWOOD FOREST.

— **Location:** Tennessee; Knox Co., Knoxville, 2.5 miles SSW of City Hall, on the University of Tennessee Cherokee Farm Woodlot; $35^{\circ}55'N$, $83^{\circ}56'W$, Knoxville Quadrangle, USGS. **Continuity:** Established 1965; 10 consecutive years. **Size:** 24.28 ha = 60 acres (block-like units, surveyed with hand-held compass and tape). **Description of Plot:** See AFN 19:593-594, 1965. **Weather:** Rainfall: January through May total was 35.19 inches; every month had above-average rainfall and the five-month total was 14.06 inches above average and the wettest of the census years. January, February and March were above normal in temperature by a total of 14.3 degrees and April and May were below normal by a total of 0.8 degrees. **Coverage:** April 18; May 1, 9, 14, 17, 24; June 11, 26. All trips between 0622 and 1135 EDT. Total man-hours: 36. **Census:** Cardinal, 36 (148, 60); Carolina Wren, 32 (132, 53); Red-eyed Vireo, 13 (54, 22); Blue Jay, 8 (33, 13); Carolina Chickadee, 7 (29, 12); Tufted Titmouse, 7; Blue-gray Gnatcatcher, 4 (16, 7); Downy Woodpecker, 3 (12, 5); Brown-headed Cowbird, 3; Rufous-sided Towhee, 3; Yellow-billed Cuckoo, 2; Pileated Woodpecker, 2; Red-bellied Woodpecker, 2; Kentucky Warbler, 2; Summer Tanager, 1.5; Screech Owl, 1; Hairy Woodpecker, 1; Acadian Flycatcher, 1; Wood Thrush, 1. **Total:** 19 species; 129.5 territorial males ($533/\text{km}^2$, 216 per 100 acres). **Remarks:** The Cardinal population increased to 36 from the 1973 low of 29. The Carolina Wren population rose 88% above the 1973 level to a high for the decade of 32 pairs. This species population, in my opinion, has a low mortality rate in wet, warm winters. The Tufted Titmouse population fell sharply to the lowest level of this study. The Red-eyed Vireo population decreased to a new low. In 1973 both the Black-and-white and Hooded Warblers had territories after a lapse of four and five years (respectively). This year neither maintained a territory although a singing Hooded Warbler visited the area twice in June. During the census period traffic passed for the first time along a new asphalt road lying as close as 75 ft to the north boundary of the plot. — J C HOWELL, *Department of Zoology, University of Tennessee, Knoxville, Tenn. 37916.*

46. LOESS BLUFF FOREST.—**Location:** Louisiana, West Feliciana Parish; 4 miles S of St. Francisville and 2 miles E of the Mississippi River. The east boundary of the plot is 200 yards W of State Highway 965 and parallels that highway; $30^{\circ}45'N$, $91^{\circ}20'W$, Section 59, T3S, R2W, St. Francisville, La. Quadrangle, USGS. **Continuity:** Established 1973. **Size:** 16.19 ha = 40 acres (1320 ft^2 , surveyed with a transit and measured with a steel tape). **Description of Plot:** See AB 27: 973-974, 1973. **Weather:** Average temperature at the beginning of each census 72° , range $69-75^{\circ}$. Rainfall was normal. Wind was no factor. **Coverage:** May 18-19, 25, 28-29, 31; June 1-2, 5. All trips between 0600 and 0930, CDT. Total man-hours: 48.5. **Census:** White-eyed Vireo, 49 (303, 122); Cardinal, 27 (167, 68); N. Parula, 20 (124, 50); Hooded Warbler, 19 (117, 48); Red-eye Vireo, 18 (111, 45); Acadian Flycatcher, 14 (86, 35); Carolina Wren, 13 (80, 32); Yellow-billed Cuckoo, 9 (56, 22); Worm-eating Warbler, 9; Tufted Titmouse, 8 (49, 20); Yellow-breasted Chat, 8; Red-bellied Woodpecker, 7 (43, 18); Swainson's Warbler, 6 (37, 15); Kentucky Warbler, 6; Com. Yellowthroat, 6; Indigo Bunting, 5 (31, 12); Carolina Chickadee, 4 (25, 10); Prothonotary Warbler, 4; Summer Tanager, 4 (25, 10); Ruby-throated Hummingbird, 3 (19, 8); Rufous-sided Towhee, 3; Blue Jay, 2; Blue-gray Gnatcatcher, 2; Yellow-throated Vireo, 2; Pine Warbler, 2; Am. Redstart, 2; Red-shouldered Hawk, 1; Pileated Woodpecker, 1; Great Crested Flycatcher, 1; E. Wood Pewee, 1; Wood Thrush, 1; Orchard Oriole, 1; Barred Owl, +; Painted Bunting, +. **Total:** 34 species; 258 territorial males ($1594/\text{km}^2$, 645 per 100 acres). An average of four Brown-headed Cowbirds was observed per census. **Remarks:** Brent Ortego located the first nest of the Worm-eating Warbler found in Louisiana. We observed an average of eight Gray Squirrels per census — ROBERT B. HAMILTON and ROBERT E. NOBLE, *School of Forestry and Wildlife Management, Louisiana State University, Baton Rouge, La. 70803*

47. OAK-HICKORY FOREST.—**Location:** Kansas, Jefferson Co., on the University of Kansas' Rockefeller Experimental Tract and the Nelson Environmental Study Area. Predominantly on the SW $\frac{1}{4}$, NW $\frac{1}{4}$, Section 3, T-11S, R-20E, Midland Quadrangle, USGS. **Continuity:** New. **Size:** 9.4 ha = 23.2 acres (rectangular 354×265.5 meters, measured). **Description of Plot:** The dominant canopy trees are Mossy-cup Oak (*Quercus macrocarpa*), Chestnut Oak (*Q. muehlenbergii*), Red Oak (*Q. borealis*) and Green Ash (*Fraxinus pennsylvanica*). The most prominent shrubs in the undergrowth include Am. Elm (*Ulmus americana*), Hackberry (*Celtis occidentalis*), Rough-leaved Dogwood (*Cornus drummondii*) and Redbud (*Cercis canadensis*). Poison Ivy (*Rhus radicans*) and Virginia Creeper (*Parthenocissus quinquefolia*) are found entwined on nearly every tree in the area. The ground cover is primarily Poison Ivy, Wild Gooseberry (*Ribes missouriense*), Coralberry (*Symporicarpos orbiculatus*) and Tick-trefoil (*Desmodium nudiflorum*). A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, based on five 0.1 acre circular samples, 264/acre; total basal area $114.9 \text{ ft}^2/\text{acre}$. Species comprising 90% of the total

number of trees (figures after each give number of trees/acre, relative density (%), relative dominance, and frequency in that sequence): Mossy-cup Oak, 54, 21, 34, 100; Green Ash, 42, 16, 13, 100; Chestnut Oak, 34, 13, 14, 80; Red Oak, 32, 12, 21, 40; Dead trees, 26, 10, 6, 100; Am. Elm, 24, 9, 4, 60; Shagbark Hickory (*Carya ovata*), 12, 9, 5, 60. Trees by diameter class (figures after each class give number of trees/acre, relative density (%), basal area in square ft/acre, and relative dominance): A (3-6 in.) 160, 61.5, 8, 15; B (6-9 in.) 26, 10, 3.9, 7; C (9-15 in.) 50, 19.2, 20, 37; D (15-21 in.) 22, 8.5, 19.8, 36; E (21-27 in.) 2, 0.8, 3.1, 6. Shrub stems/acre 4900; ground cover 72%; canopy cover 88%; average canopy height 49 ft. (range 42-58). **Edge:** Bordered on all sides by similar forest except for the middle of the south edge which is open oak woodland. **Topography:** A wooded ravine with steep slopes converging upon an intermittent stream bed running E-W through the center of the area. Elevation at the north and south boundaries is about 1040 ft and at the stream bed varies from 960 ft at the east boundary to 940 ft at the west boundary. **Weather:** Precipitation patterns were normal for May and June but drought prevailed throughout July. **Coverage:** May 16, 18, 21, 25, 28; June 16, 18, 22; July 6. All trips between 0630 and 1000 hours, CDT. Total man-hours: 22. **Census:** Blue Jay, 5, (53, 22), Cardinal, 5; E. Wood Pewee, 4 (43, 17); Black-capped Chickadee, 4; Wood Thrush, 4; Mourning Dove, 3 (32, 13); Yellow-billed Cuckoo, 3; Great Crested Flycatcher, 3; Tufted Titmouse, 3; Brown-headed Cowbird, 3; Downy Woodpecker, 2; White-breasted Nuthatch, 2; Am. Robin, 2; Kentucky Warbler, 2; Rose-breasted Grosbeak, 2; Rufous-sided Towhee, 2; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Red-eyed Vireo, 1; N. Parula, 1; Scarlet Tanager, 1; Red-tailed Hawk, +; Red-headed Woodpecker, +; Blue-gray Gnatcatcher, +; N. Oriole, +. **Total:** 24 species; 51 territorial males ($543/\text{km}^2$, 220 per 100 acres). **Remarks:** The following nests were found: Cardinal 3, Wood Thrush 2, Mourning Dove 1, Downy Woodpecker 1, E. Wood Pewee 1, Am. Robin 1, Rose-breasted Grosbeak 1, and Rufous-sided Towhee 1. — CALVIN L. CINK, *Museum of Natural History, University of Kansas, Lawrence, Kansas 66045.*

48. SOUTHERN FLOODPLAIN FOREST. — **Location:** Texas, Nacogdoches Co., 10 miles SW of City of Nacogdoches, in Stephen F. Austin Experimental Forest; 94°47'N, 31°29'W; U.S. Geological Survey; Clawson Quadrangle, Texas; approximately 150 m north of the Angelina River and 50 m west of the Sun Pipeline. **Continuity:** New. **Size:** 25 ha = 6.18 acres (square, 500 by 500 m with 50 m grid). **Description of Plot:** The dominant canopy trees are Overcup Oak (*Quercus lyrata*) and Willow Oak (*Q. phellos*). Also present in the canopy are Bitternut Hickory (*Carya cordiformis*), Sweet-gum (*Liquidambar styraciflua*), and Black-gum (*Nyssa sylvatica*). In the understory are found Green Ash (*Fraxinus pennsylvanica*), Am. Elm (*Ulmus americana*), hawthorn (*Crataegus* spp.), and seedlings of Sweet-gum, Black-gum, Willow Oak, Bitternut Hickory, Am. Elm, and Green Ash. The dominant understory plant is Deciduous Holly (*Ilex decidua*) and dominant along the small creek which crosses the plot is Am. Hornbeam (*Carpinus caroliniana*). The

dominant vines are Trumpet-honeysuckle (*Campsis radicans*) and Crossvine (*Bignonia capreolata*). The dominant ground vegetation is Pepper-vine (*Ampelopsis arborea*). A vegetational survey using 5 tenth-acre circles gave the following results: Trees 3 inches diameter and over: 304/acre; total basal area 181.6 ft²/acre. Species comprising 99% of the total number of trees (figures are trees/acre, relative density (%), relative dominance, and frequency, in that order) Overcup Oak, 104, 34, 15, 100; Sweet-gum, 42, 14, 60, Bitternut Hickory, 38, 12, 9, 100; Am. Elm, 24, 8, 3, 80, Black-gum, 14, 5, 7, 60; Green Ash, 8, 2, 2, 60; Am. Hornbeam, 2, 3, 20; Water Oak (*Q. nigra*), 2, 1, 3, 20. Trees by diameter size class (figures after each class give trees/acre, relative density, basal area in square feet/acre, relative dominance): A (3-6 in.), 142, 47, 14 2, 8; B (6-9 in.), 88, 29, 26.4, 14; C (9-15 in.), 39, 12, 28 8, 16; D (15-21 in.), 16, 5, 28.8, 16; E (21-27 in.), 16, 5, 49 6, 27; F (27-33 in.), 4, 1, 19.6, 11; G (32-40 in.), 2, 1, 14.2, 8. Shrub stems/acre: 12,400; ground cover 26%; canopy cover 83%; canopy height, avg. 77 ft, range 61-94 ft. **Edge:** Bordered on three sides by similar forest with the east side situated 50 m into the forest from the pipeline to reduce edge effect. **Topography:** In the Angelina River floodplain; flat throughout. One small creek and several drainages cross the plot. **Elevation:** 180 ft. **Coverage:** June 15-16, 22-23, 26, 29; July 4, 8. All censuses were made between 0630 and 1100. Total man-hours: 32. **Census:** Acadian Flycatcher, 56 (224, 91), Red-eyed Vireo, 23 (92, 37); Cardinal, 20 (80, 32), Tufted Titmouse, 16 (64, 26); Carolina Wren, 16, Prothonotary Warbler, 16; Yellow-billed Cuckoo, 15 (60, 24); Blue-gray Gnatcatcher, 12 (48, 19); Downy Woodpecker, 8 (32, 13); Great Crested Flycatcher, 7 (28, 11); Ruby-throated Hummingbird (females), 4, (16, 6); Red-bellied Woodpecker, 4; Carolina Chickadee, 3 (12, 5); Yellow-throated Vireo, 3; Yellow-throated Warbler, 3; Summer Tanager, 3; White-breasted Nuthatch, 2; Brown-headed Cowbird (females), 2, Pileated Woodpecker, 1; E. Wood Pewee, 1; White-eyed Vireo, 1; Black-and-white Warbler, 1; Am. Redstart, 1; Barred Owl, +. **Total:** 24 species; 215 territorial males or females ($860/\text{km}^2$, 348 per 100 acres) **Remarks:** Nests located: Yellow-billed Cuckoo, 1, Acadian Flycatcher, 1. The plot is located in a remote part of the experimental forest, relatively undisturbed by man. Mammals such as the Raccoon and Gray Squirrel are abundant. — STEPHEN B. HIGH-TOWER (compiler), C.D. FISHER, MICHAEL L BUTTS, *Stephen F. Austin State University, Nacogdoches, Texas, 75961.*

49. BALM 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, 3 consecutive years. **Size:** A re-measurement of the plot indicates it is actually 12.25 ha = 30.27 acres (square 49-50x50m. plots, using calibrated wire and compass) **Description of Plot:** See AB 26:956, 1972. **Weather:** Generally clear to partly cloudy with two censuses conducted on overcast days and no precipitation. Wind speed varied from force 0 to 3 with only two days greater than 2. Temperature for the period varied from

42° to 70°F. **Coverage:** June 1, 5, 7, 13, 24, 26, 29; July 1, 3. All trips between 0510 and 0800; the average for each trip 1.5 hours. Total man-hours: 12.5. **Census:** Ovenbird, 29 (237, 96); Red-eyed Vireo, 9 (73, 30); Black-throated Green Warbler, 6.5 (53, 21); Nashville Warbler, 6 (49, 20); Blackburnian Warbler, 3 (24, 10); Blue Jay, 2; Red-breasted Nuthatch, 2; Golden-crowned Kinglet, 2; Black-and-white Warbler, 2; Chestnut-sided Warbler, 2; Mourning Warbler, 2; Brown-headed Cowbird, 2; Evening Grosbeak, 2; Broad-winged Hawk, 1; Ruffed Grouse, 1; Com. Flicker, 1; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Veery, 1; Magnolia Warbler, 1; Rose-breasted Grosbeak, 1. **Total:** 22 species; 78.5 territorial males or females ($641/\text{km}^2$, 259 per 100 acres). **Remarks:** Three nests were located: Broad-winged Hawk, 1; Hairy Woodpecker, 1; Ovenbird, 1. Red Squirrels, White-tailed Deer, and Varying Hare were sighted at least once. There was a decrease in the population from 108 to 78.5 territorial males from last year, indicating a return to the 1972 population level of 81.5. Decreases were noted in almost every species and minor changes occurred in the species composition. — GERALD J. NIEMI, 227 W. 4th St., Duluth, Minn. 55806.

50. DECIDUOUS - CONIFEROUS SECOND-GROWTH NORTHWOODS. — **Location:** Vermont: Washington Co., SW corner Cabot; 72°23'N, 44°23'W, Plainfield Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 15 ha = 37 acres. **Description of Plot:** See AB 26:957-8, 1972. **Coverage:** April 29 to June 19; 23 early morning trips. Total man-hours: 28.5. **Weather:** Early morning temperature range 30° - 66°, (average 50°), 52% overcast. Very little snow. **Census:** Ovenbird, 8 (55, 22); White-throated Sparrow, 7 (47, 19); Black-capped Chickadee, 3 (20, 8); Veery, 3; Nashville Warbler, 3; Com. Yellowthroat, 3; Canada Warbler, 3; Song Sparrow, 3; Winter Wren, 2; Gray Catbird, 2; Am. Robin, 2; Ruby-crowned Kinglet, 2; Yellow-rumped Warbler, 2; Black-throated Green Warbler, 2; Blackburnian Warbler, 2; Red-eyed Vireo, 1.5; Ruffed Grouse, 1; Am. Woodcock, 1; Hairy Woodpecker, 1; E. Phoebe, 1; Least Flycatcher, 1; E. Wood Pewee, 1; Blue Jay, 1; Red-breasted Nuthatch, 1; Wood Thrush, 1; Hermit Thrush, 1; Golden-crowned Kinglet, 1; Black-and-white Warbler, 1; Magnolia Warbler, 1; Cape May Warbler, 1; Black-throated Blue Warbler, 1; Chestnut-sided Warbler, 1; **Total:** 33 species; 64.5 territorial males ($431/\text{km}^2$, 174 per 100 acres). **Remarks:** Three nests were found: E. Phoebe, White-throated Sparrow, and Song Sparrow. — BARBARA CARPENTER, Marshfield, Vt. 05658.

51. CLIMAX HEMLOCK-WHITE PINE FOREST, WITH TRANSITION HARDWOODS. — **Location:** Connecticut; Litchfield Co., White Memorial Foundation, Litchfield; 41°43'20"N, 73°12'W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 8 intermittent years. **Size:** 10.52 ha = 26 acres (roughly a trapezium). **Description of Plot:** See AFN 19: 594-595, 1965. **Coverage:** June 4, 6-7, 9-11, 15, 17, 19, 22. Hours varied 'round the clock, with the great emphasis before 0600, and totaled more than 21. **Census:** Ovenbird, 9.5 (90, 37); Wood Thrush, 6 (57, 23); Blackburnian War-

bler, 5.5 (52, 21); Veery, 5 (48, 19); Solitary Vireo, 3 (29, 12); Black-throated Green Warbler, 3; Scarlet Tanager, 3; Black-capped Chickadee, 2.5; Brown Creeper, 2.5; Red-eyed Vireo, 2.5; Blue Jay, 2; Black-and-white Warbler, 2; Rufous-sided Towhee, 2; Red-breasted Nuthatch, 1.5; Barred Owl, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Corn. Crow, 1; White-breasted Nuthatch, 1; House Wren, 1; Am. Robin, 1; Canada Warbler, 1; Brown-headed Cowbird, 1; Rose-breasted Grosbeak, 1; Gray Catbird, 0.5; Mourning Dove, +; Com. Flicker, +; E. Wood Pewee, +; Tufted Titmouse, +; N. Yellowthroat, +; Com. Grackle, +; Cardinal, +; White-throated Sparrow, +; Song Sparrow, +. **Total:** 34 species; 60.5 territorial males ($575/\text{km}^2$, 233 per 100 acres). **Remarks:** Change was slight and of uncertain significance. The number of Ovenbirds rose. Surprisingly, both Wood Thrushes and Veeries rose. Before this year, if the number of one thrush rose, the other would decline. Their combined total was always between 6 and 8.5; this year it was 11. Black-throated Green Warbler, now at 3, is continuing to decline from a peak of 11 in 1967. Solitary Vireo edged out Red-eyed Vireo for the first time. — ANDREW MAGEE, 34 Hobson St., Springfield, Mass. 01109, sponsored by the Litchfield Hills Audubon Society, Litchfield, Conn.



Census 52. White Pine saplings under Hemlock and White Pine canopy.

52. HEMLOCK-WHITE PINE-HARDWOOD — **Location:** Connecticut, Tolland Co., 1.8 mi. SE Union, lower western slope of Walker Mountain; Westford Quadrangle, USGS. **Continuity:** New. **Size:** 10 ha = 24.7 acres (rectangular, 400 x 250 m, measured with compass and tape). **Description of Area:** See AB 28:698, 1974. **Edge:** Similar forest type with Bigelow Brook and some wooded swamp 100 m to west of plot. **Weather:** Data from U.S. Weather Service, Windsor Locks, Conn., monthly average followed in parentheses by monthly normal. Temperature: April, 50.7°F. (47.7); May, 56.6 F. (58.3); June, 67.3 F. (67.8). Rainfall: April, 3.64 in. (3.75); May, 3.03 in. (3.50); June, 2.38 in. (3.53). Data indicate near normal conditions. **Coverage:** May



Census 52. View of dense Hemlock stand showing sparsity of ground cover.

15, 20, 22, 26-27, 31; June 3-4, 7, 11-12, 14-15, 18-19, 21, 28; July 2, 7, 13. All trips between 0500 and 1945 hours, vast majority between 0500 and 0800. Total man-hours: 35. **Census:** Ovenbird, 13 (130, 53); Red-eyed Vireo, 7.5 (75, 30); Veery, 6 (60, 24); Blackburnian Warbler, 6; Rufous-sided Towhee, 6; Black-and-white Warbler, 5 (50, 20); Scarlet Tanager, 4 (40, 16); Black-throated Green Warbler, 3.5 (35, 14); Black-capped Chickadee, 3 (30, 12); Hermit Thrush, 3; Brown-headed Cowbird, 3; Wood Thrush, 2.5; Brown Creeper, 2; Solitary Vireo, 2; Winter Wren, 1.5; Black-billed Cuckoo, 1; Pileated Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 1; Red-breasted Nuthatch, 1; Golden-crowned Kinglet, 1; Chestnut-sided Warbler, 1; Am. Robin, 0.5; Louisiana Waterthrush, 0.5; Red-tailed Hawk, +; Rose-breasted Grosbeak, +; White-throated Sparrow, +. **Total:** 27 species; 76 territorial males ($760/\text{km}^2$, 308 per 100 acres). **Remarks:** Gypsy Moth defoliation hardly noticeable and confined to isolated oaks. Nests found: Pileated Woodpecker, 1; Wood Thrush, 1; Golden-crowned Kinglet, (this nest represents first known breeding record for eastern Connecticut), 1; Black-and-white Warbler, 1; Scarlet Tanager, 1; Rufous-sided Towhee, 1. Mammals seen include White-tailed Deer, Porcupine, Red Squirrel, E. Gray Squirrel, Raccoon, and Mink. I wish to thank David Smith and the Yale University School of Forestry and Environmental Studies for permission to conduct the study in Yale Forest. — JOSEPH L. SUCHECKI, *Biological Sciences Group, Univ. of Conn., Storrs, Conn., 06268.*

53. UPLAND MIXED PINE-SPRUCE-HARDWOOD PLANTATION. — **Location:** New York; Allegany Co., on the south side of Brown Road, near its intersection with the Vandermark Road, in the town of

Ward, 3.5 miles west of Alfred, $42^\circ 7' 30''\text{N}$, $77^\circ 45' \text{W}$; Andover Quadrangle, USGS. **Continuity:** New. **Size:** 16.6 ha = 41 acres (roughly rectangular; perimeter measured with tape and compass). **Description of Plot:** Part of a 2700-acre State Reforestation Area. See AB 28:699, 1974. **Weather:** Data provided by the Alfred Cooperative Weather Station indicated that rainfall and mean temperatures during May and June did not vary significantly from the 56-year averages. Rainfall in July was considerably below normal. **Coverage:** May 21, 24, 28; June 1, 4, 9, 17-18, 29; July 8, 15. Hours varied from 0600 to 1930 EDT and totaled 26 man-hours. **Census:** Golden-crowned Kinglet, 16 (96, 39); Black-throated Green Warbler, 13 (78, 32); Magnolia Warbler, 11 (66, 27); Blackburnian Warbler, 7 (42, 17); Dark-eyed Junco, 5 (30, 12); Blue Jay, 4 (24, 10); Am. Robin, 4; Com. Yellowthroat, 3.5 (21, 9); Black-capped Chickadee, 3 (18, 7); Canada Warbler, 2.5; Brown Creeper, 2; Wood Thrush, 2; Veery, 2; Song Sparrow, 2; Indigo Bunting, 1.5; White-throated Sparrow, 1.5; Turkey, 1; Yellow-bellied Sapsucker, 1; House Wren, 1; Solitary Vireo, 1; Red-eyed Vireo, 1; Yellow-rumped Warbler, 1; Ovenbird, 1; Brown-headed Cowbird, 1; Cardinal, 1; Purple Finch, 1; Scarlet Tanager, +; Rose-breasted Grosbeak, +; Chipping Sparrow, +. **Total:** 29 species; 90 territorial males ($542/\text{km}^2$, 220 per 100 acres). **Remarks:** Am. Woodcock, Hairy and Downy Woodpeckers, nuthatches, and waxwings may have been nesting but it was impossible to define any territories. There may very well have been more territorial chickadees than noted above. Three nests were located: chickadee; Cardinal and White-throated Sparrow. Appreciation is extended to Lou and Doris Burton for photographic work and to William Howe for field assistance. —ELIZABETH W. BROOKS, *Water Wells Rd., Alfred Station, N.Y. 14803.*

54. HEMLOCK-MIXED BIRCH — **Location:** Pennsylvania; Butler Co., Buffalo Township, 1 mile S of the intersection of State Route 228 and Kepple Road on Todd Sanctuary (owned by Audubon Society of Western Pennsylvania), 40°44'N, 79°42'W, USGS Freeport Quadrangle. **Continuity:** New. **Size:** 22 ha = 54.3 acres (line transect, measured). **Description of Plot:** The dominant canopy species are Black Birch (*Betula lenta*), Yellow Birch (*B. lutea*), and E. Hemlock (*Tsuga canadensis*). Most prominent species in the understory are Witch Hazel (*Hamamelis virginiana*), Maple-leaved Viburnum (*Viburnum acerifolium*), Poison Ivy (*Rhus radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*). The ground cover is Violet, New York Fern (*Thelypteris noveboracensis*), Spinulose Woodfern (*Dryopteris spinulosa*), Hayscented Fern (*Dennstaedtia punctilobula*). A quantitative survey of the vegetation follows: Trees 3 inches in diameter and over, based on eight circular samples, 444/acre; total basal area 111 ft²/acre. Species comprising 90% of total trees: Black Birch, 136, 30.6, 16.8, 87.5; Yellow Birch, 54, 12.2, 15.1, 50; Hemlock, 68, 15.3, 12.8, 87.5; Black Cherry (*Prunus serotina*), 35, 7.9, 6.0, 75; Red Maple (*Acer rubrum*), 19, 4.3, 3.6, 50; White Oak (*Quercus alba*), 19, 4.3, 13.1, 25; Red Oak (*Q. rubra*), 15, 3.4, 4.6, 50, Basswood (*Tilia americana*), 42, 9.5, 8.6, 37.5; Sugar Maple (*A. saccharum*), 10, 2.2, 1.1, 25; dead snags, 18, 4.0, 5.8, 87.5. Trees by diameter size class: A (3-6 in.) 314, 70.9, 31.4, 28.3; B (6-9 in.), 68, 15.4, 20.2, 18.2; C (9-15 in.), 52, 11.7, 42.0, 37.8; D (15-21 in.), 8, 1.8, 13.5, 12.2; E (21-27 in.), 1, 0.2, 3.9, 3.5. Shrub stems/acre: 16,000; ground cover 56.7%; canopy cover 88.6%; canopy height 10-25 meters, average 19 meters. **Edge:** Bordered on all sides by mixed Oak-Maple-Birch forest. **Topography:** Transect follows a deep, high gradient ravine with the walls rising 100 ft on either side. **Elevation:** 880-1000 ft. **Weather:** Cool to warm, with occasional rain. **Coverage:** May 21, 27; June 3, 6, 11, 16, 19, 27. All trips between 0500 and 0800 with added observations during the day. Man-hours: 24 hours. **Census:** Red-eyed Vireo, 11 (50, 20); Acadian Flycatcher, 9 (41, 17); Cardinal, 9; Ruffed Grouse, 5 (23, 9); Tufted Titmouse, 5; Scarlet Tanager, 5; E. Wood Pewee, 4 (18, 7); Wood Thrush, 4; Carolina Wren, 3 (14, 6); Louisiana Waterthrush, 3; Kentucky Warbler, 3; Brown-headed Cowbird, 3; Indigo Bunting, 3; Black-capped Chickadee, 2; Blue-gray Gnatcatcher, 2; Cerulean Warbler, 2; Screech Owl, 1; Com. Flicker, 1; Pileated Woodpecker, 1; Downy Woodpecker, 1; E. Phoebe, 1; Black-and-white Warbler, 1; Rufous-sided Towhee, 1; Sharp-shinned Hawk, +; Great Crested Flycatcher, +; Blue Jay, +; Com. Crow, +. **Total:** 27 species; 80 territorial males or females (364/km², 147 per 100 acres). **Remarks:** Nests found: Cardinal, 3; Louisiana Waterthrush, 2; Ruffed Grouse, 1; Acadian Flycatcher, 1; Wood Thrush, 1. I thank Frank Bell and Brian Donahue for help with the vegetation analysis and the census and Paul Wiegman for reading the manuscript. — G. THOMAS BANCROFT, RD#3 Cedar Run Road, Allison Park, Pa. 15101.

55. 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°07'18"N, 79°10'47"W, Bakersville Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 330 x 1980 ft, measured) **Description of Plot:** Trees, 3 inches in diameter and over (alive and dead), based on six 0.1 acre circular samples 477/acre; total basal area 189.8 ft²/acre. Species comprising 93% of the total number of trees: Red Maple (*Acer rubrum*), 155, 33, 39, 100; dead trees 148, 31, 22, 100; White Pine (*Pinus strobus*), 55, 12, 19, 83; Sassafras (*Sassafras albidum*), 27, 6, 3, 100; Black Cherry (*Prunus serotina*), 13, 3, 6, 33; Black Birch (*Betula lenta*), 17, 4, 1, 33; Black Gum (*Nyssa sylvatica*), 12, 2, 1, 33; Chestnut Oak (*Quercus prinus*), 12, 2, 3, 33. Trees (alive and dead) by diameter size class: A (3-6 in.) 243, 51, 24.3, 13; B (6-9 in.) 118, 25, 35.5, 19; C (9-15 in.) 85, 18, 68, 36; D (15-21 in.) 25, 5, 45, 24; E (21-27 in.) 2, -, 5.2, 3; F (27-33 in.) -, -, -, -; G (33-40 in.) 2, -, 11.8, 6. Ground cover — average 88%, including dense Mountain Laurel (*Kalmia latifolia*) in some areas, *Rhododendron maximum*, blueberry (*Vaccinium* sp.), Witch Hazel (*Hamamelis virginiana*), various ferns. Canopy cover 63%. Canopy height average 41 ft (range 35-50 ft.). **Edge:** Surrounded on all sides by similar vegetation. **Topography:** Nearly flat with rock outcrops. **Elevation:** 2720 ft. **Weather:** Warm and clear for eight days, heavy rain for one day. **Coverage:** June 8-16 Hours: 0500 to 0930, 1200 to 1300, and 1700 to 1930 Total party-hours: 25.2. **Census:** Red-eyed Vireo, 4 5 (74, 30); Veery, 3 (49, 20); Solitary Vireo, 3; Ovenbird, 3; Rufous-sided Towhee, 3; Dark-eyed Junco, 3; Canada Warbler, 2.5; Hermit Thrush, 1.5; Black-throated Blue Warbler, 1.5; Scarlet Tanager, 1; E. Wood Pewee, 0.5; Black-capped Chickadee, 0.5; Brown Creeper, 0.5; Wood Thrush, 0.5; Black-and-white Warbler, 0.5; Magnolia Warbler, 0.5; Com. Yellowthroat, 0.5; Chipping Sparrow, 0.5; Com. Flicker, +; Pileated Woodpecker, +; Downy Woodpecker, +; Blue Jay, +; Com. Raven, +. **Total:** 23 species; 30 territorial males (494/km², 200 per 100 acres). **Remarks:** One Solitary Vireo nest was found. A Black Bear was seen. Vegetation analysis courtesy of Mrs. John R Thorne. The cooperation and assistance of Glen Phillips and the Brooks Bird Club is gratefully acknowledged. — R. CARRELL ABBOTT, 8468 Peebles School Road, Pittsburgh, Pa. 15237.

56. OAK-PINE-BEECH WOODLANDS. **Location:** West Virginia; Ritchie Co., about 2 miles WNW of Harrisville. The centerline starts at 39°13'02"N, 81°05'30"W and extends N, Harrisville Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** Dominant in the canopy are oak (*Quercus* sp.), pine (*Pinus* sp.) and Am. Beech (*Fagus grandifolia*). The understory is mostly seedlings of the canopy trees with Dogwood (*Cornus florida*), Red Maple (*Acer rubrum*) and Black Gum (*Nyssa sylvatica*). May Apple (*Podophyllum peltatum*), Christmas Fern (*Polystichum acrostichoides*) and Black Snakeroot (*Cimicifuga racemosa*) are the most prominent ground cover plants. A quantitative survey of trees 3 inches diameter and over, based on six circular one-tenth acre samples, show 252/acre; Total basal area 134.6 ft²/acre. Species comprising 90% of the total number of trees: White Oak (*Q.*

alba), 63, 25, 26, 100; Scarlet Oak (*Q. coccinea*), 7, 3, 9, 50, Red Oak (*Q. rubra*), 7, 3, 6, 50; Black Oak (*Q. velutina*), 7, 3, 8, 50; Mockernut Hickory (*Carya tomentosa*), 17, 7, 8, 67; Shagbark Hickory (*C. ovata*), 10, 4, 3, 33; Am. Beech (*Fagus grandifolia*), 22, 9, 9, 50; Sugar Maple (*Acer saccharum*), 17, 7, 3, 50; Red Maple (*A. rubrum*), 18, 7, 4, 100; White Pine (*Pinus strobus*), 18, 7, 12, 83; Tulip-tree (*Liriodendron tulipifera*), 11, 4, 5, 83; Sourwood (*Oxydendron arboreum*), 11, 4, 1, 50; Dead trees, 22, 9, 3, 83. Trees by diameter size class: A (3-6 in.) 101, 40, 10.2, 8; B (6-9 in.) 70, 24, 21, 15; C (9-15 in.) 45, 18, 36, 26; D (15-21 in.) 31, 12, 54, 40; E (21-27 in.) 1, 1, 5.2, 4; F (27-33 in.) 1, 1, 8.2, 6. Shrub stems per acre: 9242; ground cover 33%; canopy cover 73%; Average canopy height 80 ft (range 68-90 ft). Plant names from Strausbaugh and Core, *Flora of West Virginia*. **Edge:** Bounded on all sides by similar cover. **Topography:** A western slope of about 20 degrees. **Elevation:** About 900 ft. **Weather:** Foggy each morning, burning off to fair remainder of day. Little wind at any time. Daytime temperatures in low 70s. **Coverage:** June 1-6; 13 trips, 8 between 0540 and 0800 plus 2 mid-morning, 1 in afternoon and 2 between 1930 to 2030 totaling 13 man-hours. **Census:** Red-eyed Vireo, 6 (99, 40); Acadian Flycatcher, 5 (82, 33); Ovenbird, 5; E. Wood Pewee, 3 (49, 20); Tufted Titmouse, 2; Black-and-white Warbler, 2; Cerulean Warbler, 2; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Wood Thrush, 1; Blue-gray Gnatcatcher, 1; Scarlet Tanager, 1; Pileated Woodpecker, 0.5; Red-bellied Woodpecker, 0.5; Downy Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Worm-eating Warbler, 0.5; Yellow-billed Cuckoo, +; Black-billed Cuckoo, +; **Total:** 19 species; 32.5 territorial males (535/km², 217 per 100 acres). **Remarks:** A male Broad-headed Skink of almost record size was found as well as four Box Turtles which ranged in sizes from a small tea cup to very large. Two White-tailed Deer were sighted on half the trips and in early mornings. Bird song was highlighted by the flight song of the Acadian Flycatchers (the performance often seen as well as heard) and by an interesting double variation of the Cerulean Warbler's song. The plot seemed atypical in the scanty number of Wood Thrushes but not in other species. — DOROTHY BROEMSEN and ESTHER C. REICHELDERFER, Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

57. CENTRAL HARDWOOD FOREST WITH SCATTERED PINE. — **Location:** Washington, D.C., Rock Creek Park, lying S of Military Road and W of Rock Creek. **Continuity:** Established 1948; 17 intermittent years. **Size:** Until 1961, 80 acres; since 1961, 26.3 ha = 65 acres (triangular, surveyed). **Description of Plot:** See AFN 2:153-154, 1948. **Weather:** April, June and July drier than normal. **Coverage:** March 16; April 12, 20, 22, 24, 27 (2 trips), 28; May 4-5, 18, 25 (3 trips), 26 (2 trips); June 1, 25-26, 30; July 20. **Total:** 21 trips, of which 5 were partial coverage. Trip times from 0420 to 1845, EST; 13 in morning, 1 in midday, 7 in afternoon. Total man-hours: 53.33. **Census:** Tufted Titmouse, 12.5 (48, 19); Carolina Chickadee, 8.5 (32, 13); Red-eyed Vireo, 8 (30, 12); Ovenbird, 7.5 (29, 12); Carolina Wren, 6.5 (25, 10); Cardinal, 6 (23, 9); Red-bellied Wood-

pecker, 5 (19, 8); Blue Jay, 5; Downy Woodpecker, 4.5 (17, 7); White-breasted Nuthatch, 4 (15, 6); Veery, 4; Wood Thrush, 3.5 (13, 5); Scarlet Tanager, 3 (11, 5); Com. Crow, 2.5; Rufous-sided Towhee, 1.5; Pileated Woodpecker, 1; Com. Flicker, 1; Acadian Flycatcher, 1; Louisiana Waterthrush, 1; Starling, 1; Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5. **Total:** 22 species, 88 territorial males (335/km², 135 per 100 acres) **Remarks:** Nests located: Red-bellied Woodpecker (2), Carolina Chickadee, Wood Thrush, Starling, Scarlet Tanager. Notable increases over 1973: Com. Crow, Great Crested Flycatcher (reappeared), Louisiana Waterthrush (reappeared). Significant declines from 1973: Acadian Flycatcher, Am. Redstart (disappeared), Scarlet Tanager, Brown-headed Cowbird (disappeared). Overall population relative to 1973: same number of species, one less territory. — T. DENNEY, A. KENNEKE, R. D. VINE, C. E. CRAVEN (compiler), *Audubon Naturalist Society, 8940 Jones Mill Road, Washington, D.C. 20015*.

58. COASTAL MIXED PINE-OAK FOREST. —

Location: North Carolina; Brunswick Co., in Piner'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. **Size:** 19.2 ha = 47.5 acres (rectangular, surveyed in units of 150 x 650', sectioned into lots, being developed as part of the city of Long Beach; 11.4 acres are covered by paved streets with accompanying cleared rights-of-way; midway between the streets the tall trees have been cut for 20 ft power easements which total 2.9 acres). **Description of Plot:** See AB 27:978-979, 1973. An additional strip of woods, similar to the 1973 plot, totaling 7.3 acres has been added along the eastern edge giving a total of 47.5 acres. **Weather:** No extremes; warm and relatively dry during period with less rain than in 1973. **Coverage:** April 4, 26; May 3, 8, 16, 21, 25; June 4, 7, 13, 21; July 1 All surveys between 0530 and 1000 EST except one on June 13 from 1451 to 1755. Total man-hours: 66.5 **Census:** Great Crested Flycatcher, 9 (47, 19); Cardinal, 9; Tufted Titmouse, 8 (42, 17); Carolina Wren, 7 (36, 15); Blue Jay, 4.5 (23, 9); Bobwhite, 4 (21, 8); Red-bellied Woodpecker, 4; Carolina Chickadee, 4; Blue-gray Gnatcatcher, 3.5 (18, 7); Yellow-billed Cuckoo, 3 (16, 6); Com. Flicker, 3; Downy Woodpecker, 3; Painted Bunting, 3; Red-headed Woodpecker, 2; White-eyed Vireo, 2; Summer Tanager, 2; Mourning Dove, 1; Screech Owl, 1; Chuck-will's-widow, 1; Mockingbird, 1; Brown Thrasher, 1; Yellow-throated Warbler, 1; Pine Warbler, 1; Rufous-sided Towhee, 1; Pileated Woodpecker, 0.5. **Total:** 25 species; 79.5 territorial males or females (414/km², 167 per 100 acres) **Remarks:** Gray Squirrels are abundant in the area. Four summer, week-end cottages have been built since 1973 survey, giving a total of 13 houses. The increase in living use may explain the decrease in nesting Red-eyed Vireos and Pine Warblers, but probably does not explain the failure of towhees to nest in the area. The number of territorial males and the density in 1974 apparently have not been affected by the increase in land use by people. — SAMUEL R. and ISABEL H TIPTON, W. 23rd Street, Long Beach, Star Route 2, Box 780, Southport, N.C. 28461.

59. 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°17'34"N, 94°44'1"W, Lufkin Quadrangle, USGS. **Continuity:** New. **Size:** 6.32 ha = 15.6 acres (irregular, 862.5 ft x 787.5 ft, laid out with compass, steel tape and level). **Description of Plot:** The dominant canopy trees are Loblolly Pine (*Pinus taeda*), Water Oak (*Quercus nigra*), and S. Red Oak (*Q. falcata*). Most prominent in the understory are Virginia Creeper (*Parthenocissus quinquefolia*), green-brier (*Smilax* spp), Sugar Maple (*Acer saccharum*), Winged Elm (*Ulmus alata*) and saplings of the canopy trees. The ground cover is primarily Poison Ivy (*Rhus radicans*), Long-leaf Uniola (*Uniola sessiliflora*), and sedges (*Carex* spp). A quantitative survey of the vegetation shows: Trees 3 inches in diameter and over, based on six 0.1 acre circular samples, 354/acre; total basal area 63.5 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): Loblolly Pine, 96, 27, 52, 100; Water Oak, 70, 20, 8, 83; dead trees, 46, 13, 6, 100; S. Red Oak, 30, 9, 9, 67; Am. Hornbeam (*Carpinus caroliniana*), 18, 5, 2, 33; Hackberry (*Celtis occidentalis*), 14, 4, 3, 83; Am. Hophornbeam (*Ostrya virginiana*), 11, 3, 1, 50; Winged Elm, 8, 2, 1, 50; White Ash (*Fraxinus americana*), 8, 2, 1, 17; Am. Elm (*Ulmus americana*), 8, 2, 1, 50. Trees by diameter size class (figures after each class give numbers of trees/acre, relative density (%), basal area in square feet/acre, relative dominance): A (3-6 in.) 235, 66, 23.5, 23.1; B (6-9 in.) 66, 18, 19.8, 19.4; C (9-15 in.) 42, 12, 33.6, 32.8; D (15-21 in.) 11, 3, 19.8, 19.8; E (21-27 in.) 2, 0, 6.2, 4.9. Shrub stems/acre 2051.7; ground cover 40%; canopy cover 90%; average canopy height 62.7 feet (range 44-73 ft). **Edge:** Bordered on all sides by similar forest. **Topography:** Part is on a north-facing slope (1-8%), rest is essentially flat. **Elevation:** 240 ft. **Weather:** Most census dates had clear to partly cloudy skies. Temperatures ranged from 42° to 75°F. Rainfall during the census months was about normal. **Coverage:** March 29; April 5, 13, 19, 21, 26; May 5, 10, 17, 20, 24; June 3, 15. All trips between 0700 and 0800 hours. Total man-hours: 13 censusing and 20 surveying and laying out the grid. **Census:** Cardinal, 10 (158, 64); White-eyed Vireo, 7 (111, 45); Carolina Wren, 4 (63, 26); Kentucky Warbler, 3 (48, 19); Tufted Titmouse, 2; Hooded Warbler, 2; Yellow-billed Cuckoo, 1; Downy Woodpecker, 1; Carolina Chickadee, 1; Swainson's Warbler, 1; N. Parula, 1; Summer Tanager, 1. **Total:** 12 species; 34 territorial males or females (539/km², 218 per 100 acres). **Remarks:** Mammals seen were White-tailed Deer, Fox Squirrel, and Wood Rabbit. Reptiles seen and collected were a Speckled Kingsnake and a Texas Rat Snake. Setting up the grid and conducting a quantitative habitat description was a field project of the Environmental Biology Class. Special thanks to M. F. Wickman and R. C. Burleson of the Soil Conservation Agency for their assistance in laying out the grid and with the identification of plants. — CARROLL MOORE, JOHN FINLEY, LOUIS DEBETAZ (compiler), Science Division, Angelina College, Lufkin, Tex. 75901.



60. BURNED JACK PINE RIDGE. — 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°10'30"N, 92°10'30"W, Shell Lake Quadrangle, USGS. **Continuity:** New. **Size:** 13.5 ha = 33.36 acres (rectangular, 300 x 450 m; 50 x 50 m individual plots, measured by compass and calibrated wire). **Description of Plot:** The dominant canopy trees are composed almost entirely of dead, charred Jack Pine (*Pinus banksiana*) shags. Most prominent in the understory are Quaking Aspen (*Populus tremuloides*), Bush Honeysuckle (*Dierilla lonicera*), Sweet Fern (*Comptonia peregrina*), Beaked Hazel (*Corylus cornuta*), and Jack Pine. The ground cover is mainly blueberry (*Vaccinium* spp.), Wintergreen (*Gaultheria procumbens*), Bunchberry (*Cornus canadensis*), Yellow Clintonia (*Clintonia borealis*), and Large-leaf N. Aster (*Aster macrophyllus*). Approximately one-fourth of the plot is typified by large, open granite surfaces. A quantitative survey of the vegetation gave the following results Trees 3 inches in diameter and over, based on five circular samples, 264/acre; total basal area 61.4 ft²/acre Species comprising 90% of the total number of trees Burned Jack Pine, 194, 73, 80, 100; burned fir, 28, 11, 7, 60; burned White Pine (*P. strobus*), 20, 8, 5, 40. Trees by diameter size class: A (3-6 in.) 94, 36, 9.4, 15; B (6-9 in.) 124, 47, 37, 61; C (9-15 in.) 46, 17, 15, 24. Shrub stems per acre 4,400; ground cover 72%; canopy cover 13%; average canopy height 45 ft (range 30-54). **Edge:** Bordered on all sides by similar forest with the western edge within 50 ft of unburned Jack Pine. **Topography:** Situated on a ridge with a gentle upward slope from the south, southwest, and west to the highest point in the northeast corner. **Elevation:** 1380 - 1489 ft. **Weather:** Generally quite cool with temperatures ranging from 38° to 60°F. Wind never exceeded force 3 and cloud cover varied from clear to heavy overcast. No precipitation occurred during censusing. **Coverage:** June 14-21. All trips between 0510 and 0845 hours. Total man-hours: 13.5. **Census:** Chestnut-sided Warbler, 14 (104, 42); Mourning Warbler, 9 (67, 27); White-throated Sparrow, 9; Chipping Sparrow, 2; Com. Nighthawk, 1; Com. Flicker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Black-backed Three-toed Woodpecker, 1; Least Flycatcher, 1; Blue Jay, 1; Brown Thrasher, 1; Am. Robin, 1; Hermit Thrush, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Indigo Bunting, 1; Dark-eyed Junco, 1. **Total:** 18 species; 48 territorial males or females (356/km², 144 per 100 acres). **Remarks:** Nests located: Com. Nighthawk, 1; Black-backed Three-toed Woodpecker, 1; Brown Thrasher, 1. One Pine Marten was sighted, and there were good signs of Moose and White-tailed Deer. The research area is in the May 1971 Little Sioux forest fire area of the Boundary Waters Canoe Area, composed of mature, virgin Jack Pine which has never been logged and was revegetated from the last fire in 1864. Special thanks to my wife, Bonnie, for assistance in measuring the plot. — GERALD J NIEMI, 227 W. 4th St., Duluth, Minn. 55806.

61. MATURE JACK PINE FOREST. — Location

Minnesota; St. Louis Co., 19 miles E of Buyck and 0.5 mile N of Echo Trail; 48°08'N, 92°16'W, Lake Jeanette, Minn.-Ont. Quadrangle, USGS. **Continuity:** New. **Size**

12 ha = 29.65 acres (rectangular, 300 x 400m, 50x50m individual plots measured by compass and calibrated wire). **Description of Plot:** The dominant canopy tree is Jack Pine (*Pinus banksiana*). Most prominent in the understory are Beaked Hazel (*Corylus cornuta*), Bush Honeysuckle (*Diervilla lonicera*), Sweet Fern (*Comptonia peregrina*), and Red Maple (*Acer rubrum*). The ground cover is primarily blueberry (*Vaccinium* sp.), Bunchberry (*Cornus canadensis*), clubmoss (*Lycopodium* sp.), Large-leaf N. Aster (*Aster macrophyllus*), Bracken (*Pteridium aquilinum*), Wintergreen (*Gaultheria procumbens*), and Yellow Clintonia (*Clintonia borealis*). A quantitative survey of the vegetation gave the following results: Trees 3 inches in diameter and over, based on six circular samples, 402/acre; total basal area 172.2 ft²/acre. Species comprising 90% of the total number of trees: Jack Pine, 216, 54, 74, 100; Spruce (*Picea* sp.), 61, 15, 8, 100; Balsam (*Abies balsamea*), 48, 12, 3, 100; Paper Birch (*Betula papyrifera*), 43, 11, 3, 100. Trees by diameter size class: A (3-6 in.) 150, 37, 15, 9; B (6-9 in.) 137, 34, 41.3, 25; C (9-15 in.) 98, 24, 78.1, 47; D (15-21 in.) 14, 4, 26, 16; E (21-27 in.) 2, 1, 5, 3. Shrub stems per acre: 3,250; ground cover 78%; canopy cover 59%; average canopy height 54 ft (range 48-64). **Edge:** Bordered on all sides by similar forest. **Topography:** Situated on a moderately sloped ridge with local relief varying from 1400 to 1440 ft. **Weather:** Generally quite cool with temperatures ranging from 35° to 60°F. Wind varied from force 0 to 3 and cloud cover varied from clear to heavy overcast. No precipitation occurred during censusing. **Coverage:** June 14-21. All trips between 0430 and 1000. Total man-hours: 15. **Census:** Ovenbird, 12 (100, 40); Blackburnian Warbler, 10 (83, 34); Nashville Warbler, 7 (58, 24); Golden-crowned Kinglet, 4 (33, 13); Yellow-bellied Sapsucker, 3 (25, 10); Chipping Sparrow, 3; Red-breasted Nuthatch, 2; Black-and-white Warbler, 2; Yellow-rumped Warbler, 2; Yellow-bellied Flycatcher, 1; Gray Jay, 1; Blue Jay, 1; Veery, 1; White-throated Sparrow, 1. **Total:** 14 species; 50 territorial males or females (417/km², 169 per 100 acres). **Remarks:** No nests were located. Red Squirrels were frequently seen and good signs of both Moose and White-tailed Deer were present. Special thanks to my wife, Bonnie, for assistance in measuring the plot and to Karl Siderits for useful information pertaining to the study area. — GERALD J. NIEMI, 227 W. 4th St. Duluth, Minn. 55806.

62. YOUNG JACK PINE BARRENS — **Location:** Michigan; Oscoda Co., Red Oak, NW of SE quarter of Sect. 13, T27N, R1E, Red Oak Quadrangle, USGS. **Continuity:** New. **Size:** 6.48 ha = 16 acres (square 63.6 m, surveyed with steel tape and hand compass). **Description of Plot:** The only trees present were young Jack Pines (*Pinus banksiana*). There were also numerous dead snags from a few feet to 50 ft tall left from a 1964 fire and variable ground cover comprised mainly of blueberry (*Vaccinium angustifolium* and *V. myrtilloides*) and various grasses (*Sporobolus neglectus*, *Andropogon scoparius*, and *Carex* sp. the most common in that order). Sweetfern (*Comptonia peregrina*), Bearberry (*Arctostaphylos uva-ursi*), Sand Cherry (*Prunus pumila*), and Reindeer Lichen

(*Cladonia rangiferina*) constituted the remainder of the ground cover along with the many fallen dead pines from the 1964 fire. A 1963 cutting for Jack Pine pulpwood left two north-south areas open (150-200 ft wide) The subsequent fire destroyed all the remaining mature trees, and now the areas cut in 1963 have 300-500 Jack Pines/acre while the densest parts of the portions uncut in 1963 now have 11,000 + pines/acre. The eight-to-ten-inch ground cover is thickest in the denser Jack Pine areas and is much grassier in the two open areas A quantitative survey of the vegetation based on nine 0.1-acre circular samples gave the following results average tree concentration, 1350/acre; average tree height, 5.5 ft. (range, 3-8 ft.); average diameter, 1 in., average concentration dead stubs, 62/acre; average stub height, 16 ft.; average concentration of fallen dead pines, 366/acre; shrub stems/acre, 23,800 (exceedingly difficult to estimate when dealing with blueberry), ground cover 67%. **Edge:** Bordered on all sides by similar plant community. **Topography:** Slightly undulating **Elevation:** 1220 ft. **Weather:** Wet and below-normal temperatures for first week, then dryer, more normal weather for remainder of census. **Coverage:** June 15-26, 28-30; July 1. Trips during all parts of day, but mostly between dawn and 1000, and between 1300 and 1800 hours. Total man-hours: 71. **Census:** Brown Thrasher, 2.5; Vesper Sparrow, 2; Chipping Sparrow, 2; Field Sparrow, 2; E. Bluebird, 1.5; Nashville Warbler, 1, Lincoln's Sparrow, 1; Mourning Dove, 0.5; Common Nighthawk, +; E. Kingbird, +; Kirtland's Warbler, +, Brown-headed Cowbird, +. **Total:** 12 species; 12.5 territorial males (193/km², 78 per 100 acres). **Remarks:** Nine nests were located: Brown Thrasher, 2; E. Bluebird, 1; Vesper Sparrow, 3; Chipping Sparrow, 2, Field Sparrow, 1. This census was performed for the purpose of comparison with the 1942-44 censuses run on warbler barrens (Van Tyne et. al., *Aud Mag* 1942 30, 1943:23; 1944:23). Those censuses yielded an average density of 140 pairs/100 acres, which is probably higher than the average warbler barren since the pines were evidently quite old (for the Kirtland's Warbler) and had much deciduous growth mixed in. I chose this plot specifically for its young age and recent colonization by Kirtland's Warblers (1972). Thus, the density of 78 pairs/100 acres is probably lower than a barrens at its peak or decline of warbler density. The warbler count has been rising annually as the small pines in this area have grown (4, 12, 16 singing males since 1972). The census plot was more open than most typical warbler habitat in the area because government officials urged me to avoid including any warblers in my plot. Blue Jay predation was particularly obvious. Thirteen-lined Ground Squirrels, Whitetail Deer and Snowshoe Hares were also observed. Thanks to the Michigan Dept. of Natural Resources for permission to take this census and for help in its execution, and a special thanks to Lawrence Walkinshaw for his invaluable advice and assistance. — CHARLES A. MUNN, *Hudson Rd, Owings Mills, Md. 21117*.

63. TAMARACK-WHITE CEDAR SLOUGH. — **Location:** Ontario; Norfolk Co.; Port Rowan, 2 miles W of Long Point Lighthouse; 42°33'N, 80°05'W, Department of Energy, Mines and Resources, Ottawa **Continuity:** Established 1973 (10 acres of this plot were

censused in 1973). See AB 27:980, 1973. **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:** A long, narrow band of marsh and open water stretching E-W with forested ridges running parallel along the water to the N and S. Both the forest and the open water contain many dead trees. Eastern White Cedar (*Thuja occidentalis*), Tamarack (*Larix laricina*), Paper Birch (*Betula papyrifera*) and E. White Pine (*Pinus strobus*) dominate the canopy. A quantitative survey of the woody vegetation gave the following results: Trees 3 inches in diameter and over, based on 7 0.1 acre circles, 162/acre. Species comprising 90% of the total number of trees (each followed by trees/acre, relative density %, relative dominance %, and frequency), dead trees, 52, 32, 17, 86; E. White Cedar, 41, 25, 12, 57; Tamarack, 25, 15, 10, 71; Paper Birch, 22, 14, 37, 43; E. White Pine, 11, 7, 16, 29. Other canopy members are E. Red Cedar (*Juniperus virginiana*), 6 trees per acre, Ground Juniper (*J. communis*), 4 trees per acre and Riverbank Grape (*Vitis riparia*), 1 tree/acre. (It should be noted that the grape, with its vining growth habit, generally eluded both woody stem estimations and ground cover samples, and therefore its presence within the canopy may be rather underrepresented.) **Trees by diameter size class:** A (3-6 in.) 94 trees/acre, relative density 59% basal area 7 sq. ft/acre, relative dominance 16%. Class B (6-9 in.) 39, 23, 11, 25; Class C (9-15 in.) 25, 15, 19, 42, Class D (15-21 in.) 4, 3, 8, 17. There are 714 shrub stems/acre. Ground cover is 68%; canopy cover is 26%. The average canopy height is 30 ft. The ground cover was analysed using 10 one-meter-square plots. Canada Blue Joint (*Calamagrostis canadensis*) was present in 6 plots and important in 3. Both Sedge (*Carex aquatilis*) and Ground Juniper were important in three samples and present in four. The following plants were important in at least 1 plot or present in at least 3: Marsh Fern (*Thelypteris palustris*), Great Bladderwort (*Utricularia vulgaris*), Swamp Thistle (*Cirsium muticum*), Skullcap (*Scutellaria epilobiifolia*), Haircap Moss, and an unidentified grass. Other plants found at least once in the 10-plot sample are: Com. Duckweed (*Lemna minor*), Lyre-leaved Rock Cress (*Arabis lyra*), Dandelion (*Taraxacum officinale*), seedlings of Riverbank Grape, Virginia Creeper (*Parthenocissus quinquefolia*), Bedstraw (*Galium aparine*), Grove Sandwort (*Arenaria lateriflora*), Swamp Pink (*Arethusa bulbosa*), *Eleocharis* sp., Clear Weed (*Pilea pumila*), Hound's Tongue (*Cynoglossum officinale*) and unidentified grasses. Water is a major element in the census area, important in 4 plots; detritus and dead leaves were important in 2 plots and present in 3. Thirty other plants were identified in the area that did not occur in the 1-meter sample plots. **Edge:** The west and north edges border on similar habitat. The southern edge borders on fairly open sand dunes and the eastern 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 clear, sunny and warm on census dates. **Coverage:** May 28, 31; June 3, 6, 9, 14, 19, 22, 26; July 1, 7, 9, 14. All censuses between 0530 and 2015 EST; most in the early morning. Total man-hours: 42 censusing and 32 laying out the grid. **Census:** Red-



Census 63. Tamaracks killed by extensive flooding.
Photo / Kevin McGowan.

winged Blackbird, 6 (99, 40); Corn. Grackle, 6; E. Kingbird, 4 (66, 27); N. Oriole, 4; Chipping Sparrow, 2; Indigo Bunting, 1.5; Mallard, 1; Am. Woodcock, 1; Mourning Dove, 1; E. Wood Pewee, 1; Tree Swallow, 1; Black-capped Chickadee, 1; House Wren, 1; Carolina Wren, 1; Cedar Waxwing, 1; Starling, 1; Yellow Warbler, 1; Am. Redstart, 1; Brown-headed Cowbird, 1; Cardinal, 1; Song Sparrow, 1; Great Crested Flycatcher, 0.5; Brown Thrasher, +. **Total:** 23 species; 39 territorial males (642/km², 260 per 100 acres).

Remarks: Twenty-one nests were located; Red-winged Blackbird, 5; E. Kingbird, 3; N. Oriole, 3; Com. Grackle, 2; Mallard, 1; Am. Woodcock, 1; Mourning Dove, 1; Tree Swallow, 1; Cedar Waxwing, 1; Yellow Warbler, 1; Am. Redstart, 1; Cardinal, 1. The Cardinal and Am. Redstart nests were parasitized by Brown-headed Cowbirds. Other vertebrates found were White-tailed Deer, Fox Snake, N. Water Snake, Spotted and Painted Turtles. Special thanks to Marilyn Schugar for conducting the vegetation analysis, and to the Canadian Wildlife Service for providing financial assistance for this project. — GARY W. MILLER, Long Point Bird Observatory, Port Rowan, Ontario, N0E 1M0. Canada.

64. WHITE PINE-WHITE CEDAR FOREST. — **Location:** Ontario, Norfolk Co., Port Rowan, 3.5 miles W of Long Point Lighthouse; 42°32'56"N, 80°6'01"W, Gravelly Bay, Department of Energy, Mines and Re-

sources, Ottawa. **Continuity:** Established 1973. **Size:** 4 ha = 10 acres (laid out in 0.5 acre squares with compass and measured rope). **Description of Plot:** See AB 27: 980-1, 1973. (3 acres of this plot were censused in 1973). Eastern White Cedar (*Thuja occidentalis*) and E. White Pine (*Pinus strobus*) are the dominant canopy trees. Trees 3 inches in diameter and over, based on the data from 5 0.1 acre circles, 116/acre, total basal area 16.4 ft²/acre. Species comprising 90% of the total number of trees: White Cedar, 56 trees/acre, relative density 48%, relative dominance 35%, frequency 60%; White Pine, 26, 22, 46, 80; dead trees, 22, 19, 10, 80; Larch (*Larix laricina*) 8, 7, 7, 40; Red Ash (*Fraxinus*



Census 64. Dense growth of Ground Juniper with Eastern White Cedar and White Pine in background.

pennsylvanica), 4, 3, 2, 40. Trees by diameter class size: A (3-6 in.) 60 trees/acre, relative density 52%, basal area 6 ft²/acre, relative dominance 18%, B (6-9 in.) 36, 31, 11, 33; C (9-15 in.) 20, 17, 16, 49. Shrub stems/acre: 1500, 74% ground cover and 28% canopy cover. The canopy height averages 39 ft and ranges from 35 to 48 ft. The ground cover was analysed through the use of 10 sample plots of one square meter each. Present and important in 5 samples is Ground Juniper (*Juniperus communis*); present in 5 and important in 3 is Canada Blue Joint (*Calamagrostis canadensis*); present in 3 and important in 2 is Marsh Fern (*Thelypteris palustris*). Important in at least one sample plot, or present in at least three were Starflower (*Trientalis borealis*), Hound's Tongue (*Cynoglossum officinale*), Swamp Nightshade (*Solanum dulcamara*), Lyre-leaved Rock Cress (*Arabis lyrata*) and Com.

Duckweed (*Lemna minor*). Present in at least one plot are Marsh Vetchling (*Lathyrus palustris*), Dandelion (*Taraxacum officinale*), Hispid Puccoon (*Lithospermum croceum*), False Solomon's Seal (*Smilacina racemosa*), Sedge (*Carex eburea*), seedlings of Paper Birch (*Betula papyrifera*), Milkweed (*Asclepias syriaca*), and unidentified grasses. Water is an element in 4 sample plots and sand and thickly layered White Pine needles in 2. Twenty-eight other plants were identified on the plot that did not occur in the sample meter-plots. **Edge:** Bordered on the south by sand dunes and on the north by a pond. The east and west edges border on similar habitat. **Topography:** Heterogeneous, due to E-W ridges along the northern and southern edges of the area. **Elevation:** 580 ft. **Weather:** Generally warm with mixed sun and clouds. **Coverage:** May 25, 28, 31; June 3, 6, 9, 16, 19, 24, 28; July 3, 8. Hours varied between 0730 and 1245 EST, and totaled 28 man-hours censusing plus 40 laying out the grid. **Census:** House Wren, 7 (173, 70); Black-capped Chickadee, 3 (74, 30); Com. Yellowthroat, 2.5; Chipping Sparrow, 2.5; Whip-poor-will, 2; Field Sparrow, 2; E. Wood Pewee, 1.5; Mallard, 1; Great Crested Flycatcher, 1; Gray Catbird, 1; Red-winged Blackbird, 1; Indigo Bunting, 1; Rufous-sided Towhee, 1. Total: 13 species; 27.5 territorial males (680/km², 275 per 100 acres). **Remarks:** Seven nests were located: Mallard, 5; Whip-poor-will, 2. Also observed were White-tailed Deer, Fox Snakes, Ribbon Snakes, Spotted Turtles and Blanding's Turtles. Special thanks to the Canadian Wildlife Service for financial support of this project.—MARILYN SCHUGAR, NEIL BERNSTEIN, GARY MILLER and KEVIN McGOWAN (compiler), *Long Point Bird Observatory, Port Rowan, Ontario. NOE 1M0. Canada.*

65. BLACK SPRUCE-TAMARACK BOG. —

Location: New York; Delaware Co., Mud Lake Bog, about 2 miles N of Pine Lake on South Hill and about 2 miles E of West Davenport: 42°29'N, 74°55'45"W, West Davenport Quadrangle, USGS. **Continuity:** Established 1972, 2 intermittent years. **Size:** 4.6 ha = 11.3 acres (1.9 acres of central water not included in plot area: elliptical, measured into a square grid of 16 one-acre units by steel tape, and many measured vegetation edge points connected to give the vegetation zone ellipses for a plot map on graph paper, from which zonal areas and widths were determined). **Description of Plot:** See AB 26: 659-661, 1972, and 26: 959, 1972. **Weather:** Mean avg. daily temperature and total precipitation for April 47.2°F, 2.08 in., May 52.6°, 4.79 in., June 63.1°, 3.83 in. and July 67.1°, 6.86 in. Cloudy about half of the census trips. **Coverage:** June 11-14, 16-17, 20, 22, 27, 30; July 4, 7-8, 16-17, 19-21. Hours ranged from dawn to 1100 and totaled 26 man-hours. Four trips were also made in April (4, 13, 18, 20) and two in May (2, 16). **Census:** Black-capped Chickadee, 5 (109, 44); N. Waterthrush, 5; Canada Warbler, 5; Great Crested Flycatcher, 3.5 (77, 31); Scarlet Tanager, 3 (66, 27); Dark-eyed Junco, 3; Ovenbird, 2; Blue Jay, 2; Am. Robin, 2; Blackburnian Warbler, 2; Purple Finch, 2; Song Sparrow, 2; Veery, 1.5; Mallard, 1; Com. Flicker, 1; Downy Woodpecker, 1; Red-breasted Nuthatch, 1; Solitary Vireo, 1; N. Oriole, 1; Red-eyed Vireo, 1; E. Wood

Pewee, 0.5; Wood Thrush, 0.5; Rose-breasted Grosbeak, 0.5; Hermit Thrush, +. **Total:** 24 species; 46 territorial males or females ($1006/\text{km}^2$, 407 per 100 acres). **Remarks:** 3 nests were found: Mallard, Ovenbird, and junco. Total number of species was down from 26 (1972) to 24 and the density from ($1520/\text{km}^2$, 615 per 100 acres) to ($1006/\text{km}^2$, 407 per 100 acres). Two pairs of Swamp Sparrows territorial but left early in the season, replaced by Song Sparrows. The drier weather conditions greatly reduced insect populations and the bog was considerably drier than in 1972. Sharp decreases were found for: N. Waterthrush, 13 (1972) to 5; Canada Warbler 7 to 5; Com. Yellowthroat 5 to 0; Veery 6 to 1.5; Red-eyed Vireo 3 to 1 and Song Sparrow 5 to 2. Appreciable increases were noted for: Great Crested Flycatcher 1 to 3.5; Black-capped Chickadee 3 to 5, and Ovenbird 1 to 2. — J. ROBERT MILLER and LOUIS C. FARLEY III, *Hartwick College, Oneonta, N.Y. 13820.*

66. UPLAND SCOTCH PINE PLANTATION. — **Location:** New York; Allegany Co., 2 mi WSW of Alfred, bordering on the W side of Lake Road, adjacent to the evergreen plantings on the E side of Foster Lake; $42^\circ 7' 30''\text{N}$, $77^\circ 45' \text{W}$, Andover Quadrangle, USGS. **Continuity:** Established 1969; 6 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 Scotch Pine trees were harvested, and there continue to be increasingly larger open spaces and more abundant growth of brambles and Choke Cherry. **Weather:** Data provided by the Alfred Cooperative Weather Station indicated that rainfall and mean temperatures during May and June did not vary significantly from the 56-year averages. Rainfall in July was considerably below normal but would have had little effect on this study. **Coverage:** April 6; May 16, 19, 25, 30; June 3, 6, 11, 13-14, 18-19; July 2, 10, 17, 25. Hours varied from 0845 to 2030, EDT, and totaled 23 man-hours. **Census:** Song Sparrow, 28 (301, 122); Chipping Sparrow, 17 (183, 74); Am. Robin, 10 (107, 43); Field Sparrow, 10; Purple Finch, 8 (86, 35); Com. Yellowthroat, 4 (43, 17); Am. Woodcock, 3 (32, 13), Rufous-sided Towhee, 3; Yellow-rumped Warbler, 2 5, Brown-headed Cowbird, 2; Cedar Waxwing, 2; Black-billed Cuckoo, 1; Tree Swallow, 1; House Wren, 1, Prairie Warbler, 1; Alder Flycatcher, +; Black-capped Chickadee, +; Gray Catbird, +. **Total:** 18 species; 93.5 territorial males ($1005/\text{km}^2$, 407 per 100 acres). **Remarks:** Nests found, 13: Chipping Sparrow, 4, Song Sparrow, 3; Am. Robin, 2; Tree Swallow, Black-capped Chickadee, House Wren, Yellow-rumped Warbler, 1 each. Two Song Sparrow nests contained cowbird eggs. A pair of Prairie Warblers was seen feeding two young on July 17, but no nest was found. Appreciation is extended to Eddy Foster for permission to conduct this study on his land; to Dan Stutzman, co-owner of the Christmas trees; to Robert Place for weather data; to Lou Burton for his photographic work; and to William Howe for assistance in the field. — ELIZABETH W. BROOKS, *Water Wells Road, Alfred Station, N.Y. 14803.*

67. PINE PLANTATION. — **Location:** West Virginia, Ritchie Co., about $\frac{1}{4}$ mile from Goff's farm along Fowler Road, 0.6 miles from W. Va. Rt. 16 S of Harrisville. Centerline starts at $39^\circ 11' 24''\text{N}$; $81^\circ 01' 48''\text{W}$. and extends ENE. Harrisville Quadrangle, USGS **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular 110 x 660 yards, approx. 100.6 x 603.5 m, measured longitudinally and estimated laterally). **Description of Plot:** A large Virginia Pine plantation (*Pinus virginiana* or hybrid of same) located on sloping hillside owned by W. Va. Pulp and Paper Co. The pines are 8-10 ft in height, estimated age 6-8 years. Scattered among the pines are shrub-sized Sassafras (*Sassafras albidum*), Dwarf Sumac (*Rhus copallina*), Staghorn Sumac (*R. typhina*), and White Ash (*Fraxinus americana*), with blackberry (*Rubus* sp.), greenbrier (*Smilax* sp.) and scattered herbaceous plants as ground cover. Based on six 0.1 acre samples, the James-Shugart method of vegetation description revealed 9883 shrub stems per acre, 100% ground cover and 0% canopy. **Edge:** Similar habitat except at distance of about 200 yards are mature deciduous trees in what appeared to be a former fence row and, on the opposite side, a mature deciduous woods at more than 200 yards distance. **Topography:** Hillside of gentle slope. Elevation between 1100 and 1150 ft. **Coverage:** June 1-6. Times: 0530 to 0730; two late morning trips and two late afternoon trips; 14 trips, about 16 party-hours. **Census:** Prairie Warbler, 8 (132, 53); Yellow-breasted Chat, 5 (82, 33); White-eyed Vireo, 4 (66, 27); Indigo Bunting, 4; Field Sparrow, 4, Rufous-sided Towhee, 3 (49, 20); Brown Thrasher, 1, Blue-winged Warbler, 1; Red-eyed Vireo, 0.5, Brewster's Warbler, 0.5; Com. Yellowthroat, +. **Total:** 11 species; 31 territorial males ($511/\text{km}^2$, 207 per 100 acres). — KYLE BUSH, EUGENE HUTTON, FRANK MURPHY and E. R. CHANDLER (compiler), *Brooks Bird Club, 707 Warwood Ave, Wheeling, W. Va. 26003.*

68. LOBLOLLY PINE FOREST. — **Location:** Louisiana; Livingston Parish, 5.6 miles SSW of Pine Grove, 0.5 miles E of State Highway 449, $30^\circ 38' \text{N}$, $90^\circ 47' \text{W}$, Section 11, T5S, R4E, Pine Grove Quadrangle, USGS. **Continuity:** New. **Size:** 12.14 ha = 30 acres (1143 ft² surveyed with a hand-held compass and measured with a fiberglass tape). **Description of Plot:** See AB 28:706, 1974. Ground cover during this census period was generally sparse and not over 3 ft tall except in two small areas of about 1000 ft² each which have not burned for several years. These two small areas supported a light ground cover, a dense midstory of mostly Sweetgum (*Liquidambar styraciflua*), hickory (*Carya* spp.) and S. Red Oak (*Quercus falcata*) and the 45-year-old Loblolly Pine (*Pinus taeda*) overstory (average height = 92 ft). The remainder of the plot offers only the Loblolly Pine overstory and the sparse ground cover. **Weather:** Temperature at start of censuses varied from 65° to 72°F and at end from 75°F to 81°F. Wind was no factor. The sky was clear during 4 censuses and at least partly cloudy during 4 others. Rainfall was near normal. **Coverage:** May 13-14, 17, 23, 27, 31; June 3-4. All trips between 0610 and 1100, CDT. Total man-hours: 28.8. **Census:** Pine Warbler, 7 (58, 23); Brown-headed Nuthatch, 4 (33, 13); Cardinal, 3 (25, 10); Red-bellied Woodpecker, 2; Red-headed Woodpecker, 2; E



Census 68. Pure, 45 year old stand of Loblolly Pine.

Wood Pewee, 2; Carolina Wren, 2; Yellow-throated Vireo, 2; Prairie Warbler, 2; Rufous-sided Towhee, 2; Bachman's Sparrow, 2; Downy Woodpecker, 1; Acadian Flycatcher, 1; Blue Jay, 1; Tufted Titmouse, 1; E. Bluebird, 1; Summer Tanager, 1; Indigo Bunting, 1; Hairy Woodpecker, +; Great Crested Flycatcher, +; Carolina Chickadee, +. Total: 21 species; 37 territorial males ($305/\text{km}^2$; 123 per 100 acres). Remarks: Some species were largely associated with, and concentrated around, dead trees and snags. This was true for all woodpeckers (except the Red-cockaded), Carolina Chickadee, Tufted Titmouse and E. Bluebird and to a lesser extent for the E. Wood Pewee, Acadian Flycatcher, and Brown-headed Nuthatch. These dead trees and snags result from natural mortality (mostly from lightning strikes and competition with other, more vigorous trees) in this pure, even-aged stand. Most foresters consider these dead trees and snags a fire, insect, and disease hazard to the timber stand, and for that reason they remove dead trees and snags whenever possible. However, in doing so they further decrease habitat diversity in a forest type (pure, even-aged stand) already largely devoid of such diversity. The Carolina Wrens, and Rufous-sided Towhees were found only in the small areas that have somehow escaped burning for several years. — ROBERT E. NOBLE and ROBERT B. HAMILTON, School of Forestry and Wildlife Management, Louisiana State University, Baton Rouge, La. 70803.

69. 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; $47^\circ 6' 30''\text{N}$, $92^\circ 6' 30''\text{W}$, Thompson Lake Quadrangle, USGS. Continuity: New. Size: 7.5 ha = 18.53 acres (rectangular, 250 x 300 m, measured by compass and calibrated wire). Description of Plot: Clear-cut logged the summer of 1973, thus there are no trees standing. A large number of trees remain on the ground and the shrub layer is generally under 3 ft high. Most prominent in the shrub layer is Beaked Hazel (*Corylus cornuta*), Speckled Alder (*Alnus rugosa*), Quaking Aspen (*Populus tremuloides*), and Balsam Poplar (*P. balsamifera*). The ground cover is primarily Bracken Fern (*Pteridium aquilinum*), Large leaved N.

Aster (*Aster macrophyllus*), Yellow Clintonia (*Clintonia borealis*), and various grasses (*Poa* sp.). Shrub stems/acre 6,333; ground cover 85%. Edge: The western edge is about 150m from the Carroll Truck Trail with similar area in between. Bordered on the north and south by similar area; however, the southwest and northwest corners are within 10 to 20m of mature trees. The eastern edge is about 40m from a mature wooded area. Topography: A gentle sloping terrain with the center of the plot actually on a very slight knoll. Elevation: About 1445 to 1460 ft. Weather: Generally clear to partly cloudy with two censuses conducted on overcast days; no precipitation. Wind varied from force 0 to 3 with only two days greater than 2. Temperature for the period varied from 42° to 70°F . Coverage: June 1, 5, 7, 13, 24, 26, 28; July 1. All trips between 0500 and 0915 hours. Total man-hours: 11, plus 5 in measuring the plot. Census: White-throated Sparrow, 6 (80, 32); Song Sparrow, 6; Mourning Warbler, 4 (53, 22); Am. Robin, 3 (40, 16); Chestnut-sided Warbler, 2; Com. Yellowthroat, 2; Com. Snipe, 1; E. Kingbird, 1; Tree Swallow, +. Total: 9 species; 25 territorial males or females ($333/\text{km}^2$, 135 per 100 acres). Remarks: One Robin nest was located. Pishing was used quite effectively. Special thanks to Bonnie Niemi for assistance in measuring the plot. — GERALD J. NIEMI, 227 W. 4th St., Duluth, Minn. 55806.

70. 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; 3 consecutive years. Size: 16.2 ha = 40 acres. Description of Plot: See AB 26:960-961, 1972; 27:1016-17, 1973. Weather: Cloudy, cool with occasional windy, clear days. Coverage: June 1, 2, 15-16, 18-24, 26-30; July 1, 6. All trips between 0630 and 1030 hours. Total man-hours: 36. Census: Am. Robin, 6 (37, 15); Least Flycatcher, 5 (31, 13); Barn Swallow, 5; E. Phoebe, 4 (25, 10); Wood Thrush, 4; Ovenbird, 4; Com. Yellowthroat, 4; Rufous-sided Towhee, 4; Chipping Sparrow, 4; White-throated Sparrow, 4; Song Sparrow, 4; Cliff Swallow, 3 (19, 8); Red-eyed Vireo, 3; Ruffed Grouse, 2; Black-billed Cuckoo, 2; Com. Flicker, 2; Great Crested Flycatcher, 2; White-breasted Nuthatch, 2; Brown Creeper, 2; Gray Catbird, 2; Hermit Thrush, 2; E. Bluebird, 2; Chestnut-sided Warbler, 2; Red-winged Blackbird, 2; Field Sparrow, 2; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Kingbird, 1; E. Wood Pewee, 1; Tree Swallow, 1; Red-breasted Nuthatch, 1; Winter Wren, 1; Brown Thrasher, 1; Veery, 1; Black-and-white Warbler, 1; Nashville Warbler, 1; Magnolia Warbler, 1; Yellow-rumped Warbler, 1; Blackburnian Warbler, 1; House Sparrow, 1; N. Oriole, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1. Total: 44 species; 97 territorial males, ($599/\text{km}^2$, 243 per 100 acres). Remarks: An increase in flycatchers may have been owing to heavy infestation of birch trees. This would account for the reappearance of the Black-billed Cuckoo. Two pair of E. Bluebirds successfully raised 10 young from three nestings. A population explosion of cowbirds (50 to 55 juveniles counted) apparently cut down on the number of successful warbler

nestings. 25 acres of plot are being developed into 5-acre house lots. — MARTHA L. WILLIAMSON, S. Woodstock, Vt. 05071.

71. MIXED FOREST, OLD FIELD AND HOME-SITE. — **Location:** Vermont; Windsor Co., 1.5 miles S of Woodstock on Church Hill Road; 43°36'N, 72°31'W, Woodstock Quadrangle, USGS. **Continuity:** Established 1973. **Size:** 11 ha = 27 acres (determined from available maps). **Description of Plot:** See AB 27:982, 1973. **Coverage:** May 29-31; June 1-4, 6-9, 15. All trips between 0515 and 1030 or between 1700 and 1900 hours. Total man-hours: 20. **Census:** Song Sparrow, 15 (137, 56); Am. Robin, 10 (92, 37); Red-eyed Vireo, 9 (82, 33); Ovenbird, 9; Black-capped Chickadee, 8 (73, 30); Wood thrush, 7 (64, 26); Com. Yellowthroat, 7; Veery, 5 (46, 19); Least Flycatcher, 4 (37, 15); Scarlet Tanager, 4; Com. Flicker, 3 (27, 11); Great Crested Flycatcher, 3; Hermit Thrush, 3; Cedar Waxwing, 3; Black-and-white Warbler, 3; Yellow Warbler, 3; Yellow-rumped Warbler, 3; Am. Redstart, 3; N. Oriole, 3; White-throated Sparrow, 3; Ruby-throated Hummingbird, 2; Hairy Woodpecker, 2; Downy Woodpecker, 2; Tree Swallow, 2; White-breasted Nuthatch, 2; Warbling Vireo, 2; Chestnut-sided Warbler, 2; Com. Grackle, 2; Rose-breasted Grosbeak, 2; Chipping Sparrow, 2; Black-billed Cuckoo, 1; E. Kingbird, 1; E. Phoebe, 1; Traill's Flycatcher, 1; E. Wood Pewee, 1; Red-breasted Nuthatch, 1; Gray Catbird, 1; Brown Thrasher, 1; E. Bluebird, 1; Starling, 1; Nashville Warbler, 1; Black-throated Green Warbler, 1; Canada Warbler, 1; Rufous-sided Towhee, 1. Total: 44 species; 142 territorial males (1300/km², 526 per 100 acres). **Remarks:** 17 nests were found: robin, 4; Tree Swallow, 2; Wood Thrush, 2; E. Kingbird, 1; E. Phoebe, 1; House Wren, 1; Gray Catbird, 1; E. Bluebird, 1; Starling, 1; Warbling Vireo, 1; yellowthroat, 1; N. Oriole, 1. — JULIA NICHOLSON, Vermont Institute of Natural Science, Woodstock, Vt. 05091.

72. MIXED UPLAND HABITAT AND SWAMP. — **Location:** Connecticut; Fairfield Co., Newtown, intersection of Route 34 and Zoar Road; 41°24'N, 73°14'W, Southbury Quadrangle, USGS. **Continuity:** Established 1968; 7 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, 25-27, 31; June 2, 5, 7, 10, 13-14, 16-17, 24, 28, 30; July 7. All trips between 0430 and 1235 or 1530 and 2045 hours, EDT, but mainly between 0900 and 1200. Total man-hours: 40. **Census:** Rufous-sided Towhee, 14 (59, 40); Ovenbird, 12 (85, 34); Red-eyed Vireo, 11 (78, 31); Wood Thrush, 8 (56, 23); Veery, 6.5 (46, 19); House Wren, 5.5 (39, 16); Scarlet Tanager, 5 (35, 14); Am. Robin, 4 (28, 11); Brown-headed Cowbird, 4; Com. Flicker, 3.5 (25, 10); Blue Jay, 3 (21, 9); Black-capped Chickadee, 3; Tufted Titmouse, 3; Black-and-white Warbler, 3; N. Oriole, 3; Cardinal, 3; Downy Woodpecker, 2; E. Wood Pewee, 2; White-breasted Nuthatch, 2; Gray Catbird, 2; Yellow-throated Vireo, 2; Blue-winged Warbler, 2; Com. Yellowthroat, 2; Rose-breasted Grosbeak, 2; Mourning Dove, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; E. Phoebe, 1; Brown Thrasher, 1; Starling, 1; Field Sparrow, 1; Song Sparrow, 1. **Total:**

32 species; 115.5 territorial males or females (815/km², 330 per 100 acres). **Remarks:** Five nests were located: E. Phoebe, 2; House Wren, 1; Am. Robin, 1; Starling, 1. Compared with 1973 the number of species was unchanged, but total individuals fell from 137 to 115.5; Ovenbird fell from 16 to 12, Wood Thrush from 13 to 8, but Veery rose from 4 to 6.5 — LAURA H. MOSELEY, 1083 Hillsboro Beach, Pompano Beach, Fla. 33062.

73. 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; 8 intermittent years. **Size:** 8.5 ha = 21 acres (parallelogram). **Description of Plot:** See AFN 19: 609-610, 1965. **Coverage:** June 5, 8, 14, 16-17, 21, 24. Hours varied from 0430 to 2200, and totaled about 20. **Census:** Gray Catbird, 12 (141, 57); Song Sparrow, 7 (82, 33); Rufous-sided Towhee, 6 (71, 29); Com. Yellowthroat, 5 (59, 24); Field Sparrow, 5; Blue-winged Warbler, 4 (47, 19); Am. Goldfinch, 4; Am. Woodcock, 3 (35, 14); Cedar Waxwing, 3; Prairie Warbler, 3; Am. Robin, 2; Wood Thrush, 2; Yellow Warbler, 2; Brown-headed Cowbird, 2; Rose-breasted Grosbeak, 2; Brown Thrasher, 1.5; Veery, 1.5; Red-eyed Vireo, 1.5; Ruffed Grouse, 1; Com. Flicker, 1; E. Phoebe, 1; Blue Jay, 1; Black-and-white Warbler, 1; Am. Redstart, 1; Nashville Warbler, 0.5; Cardinal, 0.5; Black-capped Chickadee, +; House Wren, +; Chestnut-sided Warbler, +. **Total:** 28 species; 73.5 territorial males (865/km², 350 males per 100 acres). **Remarks:** Habitat continues to undergo rapid change from open, grazed pasture to hardwood forest. The density of species rises and falls accordingly. The drop in total density, down approximately 12.5% from a year ago, reflects in part greater accuracy through keeping track of birds which raised second and third broods with changing territorial boundaries. It was a helping factor to have completed the census fairly quickly. — ANDREW MAGEE, 34 Hobson Street, Springfield, Mass. 01109.

74. DRY COTTONWOOD SAND DUNE. — **Location:** Ontario; Norfolk Co., Port Rowan; 3.2 miles W of Long Point Lighthouse; 42°31'30"N, 80°07'W, Gravelly Bay, Dept. of Energy, Mines and Resources,



Census 74. Scattered Cottonwoods and ground cover of dune grass.

Ottawa. **Continuity:** Established 1973. **Size:** 10.53 ha = 26 acres (rectangular, very long and narrow owing to the nature of the grid; surveyed). **Description of Plot:** See AB 27: 986, 1973. **Weather:** Generally windy and often overcast. **Coverage:** May 28, 31; June 4, 7, 10, 17, 21, 25; July 1, 5. Times varied between 0545 and 1300 EST, and totaled 15 man-hours censusing and 3 repairing the grid. **Census:** Mallard, 1; Red-winged Blackbird, 0.5; E. Kingbird, 0.5. **Total:** 3 species; 2 territorial males ($19/\text{km}^2$, 8 per 100 acres). **Remarks:** One Mallard nest was located. This area seemed to be used primarily as a feeding ground. Special thanks to the Canadian Wildlife Service for financial support. — GAIL MOSES, ROSS HARRIS, MARILYN SCHUGAR, NEIL BERNSTEIN, GARY MILLER, and KEVIN McGOWAN (compiler), *Long Point Bird Observatory, Port Rowan, Ontario, N0E 1M0. Canada.*

75. DRY JUNIPER – COTTONWOOD SAVANNAH — **Location:** Ontario; Norfolk Co.; Port Rowan; 2.5 miles W of Long Point Lighthouse, 80°05'W, 42°32'48"N, Gravelly Bay, Department of Energy, Mines and Resources, Ottawa. **Continuity:** Established 1973. **Size:** 8.3 ha = 20.5 acres (approximately rectangular; plot was irregularly shaped to follow the line of the dunes; surveyed). **Description of Plot:** See AB 27:986-7, 1973. **Weather:** Generally sunny and breezy. **Coverage:** May 27, 30; June 2, 5, 8, 13, 18, 22, 26; July 2, 6, 14. All trips between 0630 and 1200 EST, and totaled 33 man-hours censusing and 12 man-hours remapping and repairing the grid. **Census:** Com. Grackle, 9 (108, 44); Red-winged Blackbird, 8 (96, 39); Field Sparrow, 3.5 (42, 17); Mallard, 3 (36, 15); Song Sparrow, 3; E. Kingbird, 2; Brown Thrasher, 1; Starling, 1; Chipping Sparrow, 1. **Total:** 9 species; 31.5 territorial males ($380/\text{km}^2$, 154 per 100 acres). **Remarks:** 17 nests were located: Mallard, 5; Com. Grackle, 9; Field Sparrow, 2; Song Sparrow, 1. White-tailed Deer and E. Cottontail Rabbits were frequently seen. Special thanks to the Canadian Wildlife Service for financial assistance. — GAIL MOSES, ROSS HARRIS, NEIL BERNSTEIN, GARY MILLER and KEVIN MCGOWAN (compiler), *Long Point Bird Observatory, Port Rowan, Ontario, Canada, N0E 1M0.*



Census 75. Scattered Red Cedar and Eastern Cottonwood.

76. DUNE GRASS – COTTONWOOD BEACH. — **Location:** Ontario; Norfolk Co.; Port Rowan; 3.2 miles W of the Long Point Lighthouse: 42°32'N, 80°07'W; Gravelly Bay, Dept. of Energy, Mines and Resources. **Continuity:** New. **Size:** 12.1 ha = 30 acres (laid out in 0.5 acre squares with compass and measured rope; rectangular, long and narrow, roughly 125 x 1200 yds). **Description of Plot:** Comprised of 3 E-W bands of different vegetational types. The southernmost strip is the sandy, pebbly shore of Lake Erie, which is almost without vegetation. North of this is a swath of grass, which is in turn bounded on the north by a sandy ridge of E. Cottonwoods. A quantitative survey of the vegetation gave the following results: Trees 3 inches in diameter and over, based on 5 0.1 acre circles, 59 per acre. Total basal area is 7.4 ft²/acre. Species comprising 100% of the total number of trees, E. Cottonwood (*Populus deltoides*) 59, 100, 100, 40. All of the cottonwoods are of diameter class size A, (3-6 in.). The average canopy height is 27.5 ft., the range from 25 to 30 ft. Canopy cover is 12%; ground cover is 10%. There are 1,000 shrub stems/acre. The ground and small shrub layers were analysed using 20 one-square-meter plots.



Census 76. Bands of vegetation from sandy shore of Lake Erie to dune grass to cottonwood ridge. Photos / Kevin McGowan.

Dune Grass (*Ammophila breviligulata*) was present and important in 5 plots, Switch Grass (*Panicum virgatum*) was present in 6 plots and important in 4. *Scirpus* sp. was important in 3 plots. Standing water was important in 2 sample meter plots. Sand, important in all meter plots, was the only component of 5 samples. The following plants were important in at least one meter plot or present in 3: Milkweed (*Asclepias syriaca*), Sand Dropseed (*Sporobolus cryptandrus*), *Eleocharis* sp., Little Bluestem (*Andropogon scoparius*), Grass of Parnassus (*Parnassia glauca*), seedlings of E. Cottonwood, and an unidentified composite and grasses. Present in at least one sample were Wormwood (*Artemisia caudata*), Lyreleaved Rock Cress (*Arabis lyra*), Com. Horsetail (*Equisetum arvense*), Hispid Puccoon (*Lithospermum croceum*), seedlings of Riverbank Grape (*Vitis riparia*). Beach Pea (*Lathyrus japonicus*) and Com. Mullein (*Verbascum thapsus*) grew in the census area but did not appear in the one-meter plots. **Edge:** Bordered on the south by Lake Erie, on the east and west by similar beach terrain, and on the north by a cottonwood covered dune that slopes down into an interdune pond. **Topography:** Slopes upward from Lake Erie part way up a sandy ridge. **Elevation:**

575 ft. **Weather:** Generally windy and often overcast. **Coverage:** May 28, 31; June 4, 7, 10, 17, 21, 25; July 1, 5. All trips between 0545 and 1300 EST. Total man-hours, 15 censusing and 31 laying out the grid. **Census:** Mallard, 1; Spotted Sandpiper, 0.5; Red-winged Blackbird, 0.5, E. Kingbird, +. **Total:** 4 species; 2 territorial males, (17/km², 7 per 100 acres). **Remarks:** One Mallard nest was found. This area seemed to be primarily used as a feeding ground. Small flocks of grackles, Red-winged Blackbirds, crows, and Starlings were often seen feeding in the cottonwoods or in the dune grasses. Grackles, Starlings, Red-winged Blackbirds and orioles often flew northward, off the grid, with insects in their beaks, presumably to feed nestlings. Small flocks of Tree Swallows, Barn Swallows and Purple Martins frequently fed on insects over the grid. Large flocks of Ring-billed Gulls (100 or more) often congregated on the beach at the water's edge. Thanks to the Canadian Wildlife Service for financial assistance. — NEIL BERNSTEIN, ROSS HARRIS, KEVIN McGOWAN, GARY MILLER (compiler), GAIL MOSES, MARILYN SCHUGAR, *Long Point Bird Observatory, Port Rowan, Ontario, Canada, NOE IMO.*

77. RECREATIONAL DUNE AREA. — **Location:** Ontario, Norfolk Co., 8 miles SSE of Port Rowan, 42°35'N, 80°23'W, Long Point, Department of Mines and Technical Surveys, Ottawa. **Continuity:** Established 1973. **Size:** 8.55 ha = 21.12 acres (rectangular, surveyed). **Description of Plot:** Sand dune sparsely covered with E. Cottonwood (*Populus deltoides*). There are 15 buildings approximately 12 x 12 ft each, scattered throughout the area. The plot is traversed by Provincial Park gravel roads 20 ft wide. Trees, 3 inches in diameter and over, based on 5 0.1 acre sample circles, 50/acre; total basal area 3.5 ft²/acre. Species comprising 100% of the total number of trees: E. Cottonwood, 50, 100, 100, 60. Trees by diameter size class: A (3-6 in.) 40, 80, 2.0, 57, B (6-9 in.) 10, 20, 1.5, 43. Shrub stems/acre, 60; ground cover, 29%; canopy cover, 13%. Average canopy height 28 ft, range 25-30 ft. Important ground cover plants are Riverbank Grape (*Vitis riparia*), White Sweet Clover (*Melilotus alba*), Wormwood (*Artemisia caudata*), Com. Milkweed (*Asclepias syriaca*) and various grasses. **Edge:** Bordered on the southern edge by Lake Erie (8 ft embankment), and on all other sides a continuation of similar dunes. **Topography:** Sand dunes modified by leveling owing to road construction. **Elevation:** 575 ft.

1973. **Weather:** Moderately hot and dry throughout census period. **Coverage:** May 31; June 2, 18; July 1-7. All trips between dawn and 0740 or 2025 to 2130. Total man-hours: 36 censusing and 82 surveying and setting up. **Census:** Com. Grackle, 3 (35, 14); E. Kingbird, 2; Brown Thrasher, 2; Killdeer, 1; Mourning Dove, 1; Tree Swallow, 1; Am. Robin, 1; E. Meadowlark, 1; Red-winged Blackbird, 1; Brown-headed Cowbird, 1. **Total:** 10 species, 14 territorial males (164/km², 66 per 100 acres). **Remarks:** Nests found, Com. Grackle, 6; E. Kingbird, 2; Killdeer, 1; Mourning Dove, 1; Brown Thrasher, 1. Deer were frequently seen in the area. Thanks to the Federation of Ontario Naturalists for financial assistance. — DICK GOODLET, PETER ROBERTS, GARY MILLER (compiler).

1974. **Weather:** Moderately hot and dry throughout census period. **Coverage:** June 14, 16-19, 24-25, 29; July 3. All trips between 0600 and 0930, or 1800 and 1930 Total man-hours: 34, plus 82 hours surveying and setting up. **Census:** Mallard, 1; Mourning Dove, 1; E. Kingbird, 1; Starling, 1; Com. Yellowthroat, 1; Red-winged Blackbird, 1; Field Sparrow, 1. **Total:** 7 species, 7 territorial males (82/km², 33 per 100 acres). **Remarks:** Nests found: Mallard, 1; Mourning Dove, 1; E. Kingbird, 1; Starling, 1; Red-winged Blackbird, 1. Deer and raccoon tracks were frequently seen. Special thanks to Gary Miller for assistance with the quantitative habitat description, to Ralph Cartar for his help with the censuses, and the Canadian Wildlife Service for financial support. — JAYNE E. EVANS, *Long Point Bird Observatory, Port Rowan, Ont. NOE 1M0. Canada.*

78. BRUSHLAND: ABANDONED FARM. — **Location:** Indiana; Monroe Co., 1 mile SW of Hickory Ridge lookout tower; Hoosier National Forest; SW part of Section 20, township 6N, range 2E, 39°01'N, 86°20'W **Continuity:** New. **Size:** 5.38 ha = 13.3 acres (irregular shape, elongate N-S; surveyed with steel tape and compass). **Description of Plot:** An old, eroded farmstead now grown up mostly to brush of varying ages. Very heavy use by motorcycles (= "trailbikes") in the years 1966-73 caused even more erosion. Most of the area is brush 6 to 10 ft high, but smaller areas are 2 to 3 ft high (mown 2 or 3 years ago) or small trees 10 to 15 ft high, and there are 4 scattered White Oaks of good size (to 14 inches dbh). A line census measured the extent of all live woody plants with leaves between 0.5 and 8 ft above ground. Along 1000 ft of total sample, there was 680 ft of coverage, by species: Winged Sumac 22%, *Rubus* sp. 12%, Flowering Dogwood 11%, Sassafras 10%, Tulip-tree 7%, Com. Greenbrier 4%, Red Maple 4%, Hazelnut 4%, Smooth Alder 3%, *Vitis* sp. 3%, Shagbark Hickory 3%, Sugar Maple 3%, White Oak 2%, Black Cherry 2%, Persimmon 2%, Red Oak 1%, Spicebush 1%, Soft-leaved Arrowwood 1%, 17 other species 5% (Big-tooth Aspen, *Salix* sp., Am. Elm, Slippery Elm, White Ash, Smooth Sumac, Pignut Hickory, Virginia Creeper, Wild Rose, Hawthorne, Peach, Choke Cherry, White Mulberry, Tartarian Honey-suckle, Red-osier Dogwood, Early Low Blueberry, Redbud). Another census, using tree methods on circular plots, measured 691 trees on 1.079 acres total sample area; within size classes, the stand was: 1-4 inches dbh basal area 20.9 ft²/acre, 616 trees/acre; 4-8 inches dbh 4.2 ft², 19 trees; 8-12 inches dbh 3.0 ft², 5 trees; 12-14 inches dbh 1.0 ft², 1 tree. **Edge:** Seven-eighths of the boundary line is 5 to 20 ft outside the edge of extending branches of forest trees of good size; about 1000 ft is bounded by brush and a small pine plantation. **Topography:** Gentle slopes extend from the north and south toward a small creek which bisects the area from west to east; the south bank of the creek is quite steep and 20 ft high. **Elevation:** 740-820 ft. **Weather:** There were numerous thundershowers in late May and June, but no rain fell during actual censusing. Winds during counts were light and variable; temperatures ranged from 44° to 75°F. **Coverage:** May 30; June 6, 7, 13, 14, 19-20, 23, 24, 26; July 1-2, 10-11. Eight complete early morning counts plus 5 evening counts and several afternoons; 29 man-hours censusing plus 28 more of

measuring and plant-censusing. **Census:** Indigo Bunting, 9 (167, 68); Prairie Warbler, 4 (74, 30); Gray Catbird, 3.5 (65, 26); Blue-winged Warbler, 3.5; Field Sparrow, 3.5; White-eyed Vireo, 3 (56, 23); Cardinal, 3; Vesper Sparrow, 3; Rufous-sided Towhee, 2.5; Bachman's Sparrow, 2; Chipping Sparrow, 2; Bob-white, 1.5; Carolina Chickadee, 1.5; Brown-headed Cowbird, 1.5 (females); Yellow-billed Cuckoo, 1; Black-billed Cuckoo, 1; Whip-poor-will, 1; Downy Woodpecker, 1; E. Phoebe, 1; Tufted Titmouse, 1; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Com. Yellowthroat, 1; Yellow-breasted Chat, 1, Am. Goldfinch, 1; Ruby-throated Hummingbird, 0.5 (female); Great Crested Flycatcher, 0.5; E. Wood Pewee, 0.5; Blue Jay, 0.5; Louisiana Waterthrush, 0.5; Summer Tanager, 0.5; Scarlet Tanager, 0.5, Mourning Dove, +; Barred Owl, +; Com. Flicker, +, Pileated Woodpecker, +; Com. Crow, +; Red-winged Blackbird, +; Rose-breasted Grosbeak, +. **Total:** 40 species; 59 territorial males (or females) ($1096/\text{km}^2$, 400 per 100 acres). **Remarks:** The greater density and more numerous bird species on this census contrast with those on the nearby clearcut (Census 79), despite the much richer soil and healthier brush on the latter area. Doubtless the cause of the contrast is the patchier pattern of brush on this plot, with many edges produced by old, eroded trails, blackberry thickets adjacent to sumac thickets, etc. We thank the supervisor of the Hoosier National Forest, and his staff for their help. — J. DAN WEBSTER and RANDALL CROOKE, Hanover College, Hanover, Ind. 47243.

79. BRUSHLAND: 8-YEAR OLD CLEARCUT. — **Location:** Indiana; Monroe Co., 2 miles WSW of Hickory Ridge lookout tower, Hoosier National Forest. In southeastern part of Section 24, township 6N range 1E, $39^{\circ}02'N$, $86^{\circ}22'W$. **Continuity:** New. **Size:** 7.7 ha = 19 acres (irregular rectangle, measured with steel tape and compass). **Description of Plot:** Dense brush 6 to 12 ft high, succeeding clearcut in 1966. Most of the stumps were oak; the dead tops and limbs left by the lumbermen were interlaced with sprouts, shrubs, saplings and vines to make walking difficult at best. The old lumber trails were mostly overgrown. A line census of woody vegetation along 500 ft of line measured the extent of all live woody plants showing leaves between 0.5 and 8 ft above the ground, for a total of 648.5 ft of coverage by species. Composition was: Sassafras 34%, *Rubus* sp. 16%, *Vitis* sp. 10%, Com. Greenbrier 6%, Winged Sumac 6%, Flowering Dogwood 5%, Persimmon 4%, Smooth Sumac 3%, Chestnut Oak 3%, Redbud 3%, Tulip-tree 3%, 12 other species 7% (Red Maple, Sugar Maple, Bigtooth Aspen, Shagbark Hickory, Pignut Hickory, Red Oak, White Oak, White Ash, N. Wild Raisin, Maple-leaved Viburnum, Poison Ivy, Black Cherry). Another census, using tree methods on 10 ft wide transects, measured trees on 0.4 acre total sample area. There were 415 trees, from 1 inch to slightly over 4 inches in diameter dbh giving a stand density of 1037/acre and stand basal area of 35.8 ft²/acre. Species composition was Sassafras 373 (density/acre), 12.7 ft² (basal area/acre), Flowering Dogwood 52, 1.8; Persimmon, 42, 1.5; Chestnut Oak, 40, 1.4; White Ash, 28, 1.0; 16 other species, 133, 4.5. **Edge:** The brushy clearcut had an irregular and in some places diffuse boundary

with the surrounding deciduous forest; the census area boundary varied from 200 ft inside the forest along the north side, to right at the edge of the tree crown in 3 spots along the east. Also, 9 live trees over 4 inches dbh and about 30 ft tall were inside the census plot near the middle of the west boundary. **Topography:** An east-facing slope, gentle to moderate, with deep, dark brown soil. **Elevation:** From 860 to 780 ft. **Weather:** Late May and June were marked by numerous heavy thunderstorms. During censuses, no rain fell, winds were light, sky conditions varied, and temperatures ranged from 43°F. to 77°. **Coverage:** May 24; June 4-5, 7-8, 12-13, 20-21, 27-29; July 3, 10-11. Total: 43 man-hours. **Census:** White-eyed Vireo, 6.5 (85, 34); Yellow-breasted Chat, 5.5 (72, 29); Gray Catbird, 5 (65, 26), Blue-winged Warbler, 4.5 (59, 24); Prairie Warbler, 4.5, Indigo Bunting, 4 (52, 21); Rufous-sided Towhee, 2.5, Brown-headed Cowbird, 2 (females); Cardinal, 2, Whip-poor-will, 1.5; Bell's Vireo, 1.5; Kentucky Warbler, 1.5; Mourning Dove, 1; Yellow-billed Cuckoo, 1, Ruby-throated Hummingbird, 1 (females); Carolina Chickadee, 1; Com. Flicker, 0.5; Downy Woodpecker, 0.5; Great Crested Flycatcher, 0.5; Carolina Wren, 0.5, Black-and-white Warbler, 0.5; Golden-winged Warbler, 0.5; Hooded Warbler, 0.5; Broad-winged Hawk, +; Am. Woodcock, +; Black-billed Cuckoo, +, Pileated Woodpecker, +; Red-headed Woodpecker, +, E. Wood Pewee, +; Tufted Titmouse, +; Blue-gray Gnatcatcher, +; Red-eyed Vireo, +. **Total:** 32 species, 48.5 territorial males (or females) ($631/\text{km}^2$, 255 per 100 acres). **Remarks:** We thank the supervisor of the Hoosier National Forest, and his staff for their help — J. DAN WEBSTER and RANDALL CROOKE, Hanover College, Hanover, Ind. 47243.

80. BRUSHY FIELDS AND HOMESITE. — **Location:** Ohio; Stark Co., North Canton; 0.4 mile W of intersection of Mt. Pleasant Road and Route 241, $40^{\circ}54'23''N$, $81^{\circ}28'9''W$, North Canton Quadrangle, USGS. **Continuity:** New. **Size:** 10.5 ha = 26 acres (L-shaped, paced). **Description of Plot:** The fields and homesite were last used in 1963. Today, the plot is densely covered by Steeplebush Spirea (*Spiraea tomentosa*), Broadleaf Spirea (*S. latifolia*), Narrowleaf Dogwood (*Cornus obliqua*), Smooth Sumac (*Rhus glabra*), blackberry (*Rubus* sp.), and goldenrod (*Solidago* sp.). The abundant invading trees are Choke Cherry (*Prunus virginiana*), Silver Maple (*Acer saccharinum*), Black Willow (*Salix nigra*), and Scotch Pine (*Pinus sylvestris*). Other plants composing more of the habitat are Red-osier Dogwood (*C. stolonifera*), Sassafras (*Sassafras albidum*), Dewberry (*R. sp.*), Tall Meadow-rue (*Thalictrum polygamum*), Skunk Cabbage (*Symplocarpus foetidus*), Com. Cattail (*Typha latifolia*), Wild Carrot (*Daucus carota*), and Bouncing Bet (*Saponaria officinalis*). There is also a narrow windbreak composed of Scotch Pine and Norway Spruce (*Picea abies*), which faces Mt. Pleasant Road. A small creek, which ran all summer, is on the S border, and a drainage ditch cuts through the middle of the plot to the creek. Also there are two, small, abandoned houses, one junked car, several trash piles, a gas company well and tank, and a gravel road. The S part of the plot, which borders the creek, was flooded several times during the spring. The average height of the vegeta-

tation is 7 ft, although several large Choke Cherries and Black Willow approach 30 ft. There are also several dead trees. **Edge:** Bordered on the N by Mt. Pleasant Road, on the S by the creek, and on the E and W by similar brush, although more advanced. **Topography:** Gently sloping toward the creek. **Elevation:** 1050-1100 ft. **Weather:** Normal temperatures, ranging from 50° to 95°, with slightly above-average precipitation. **Coverage:** April 27; May 4, 8, 13-14, 17, 19, 25-26; June 1, 8-9, 16; July 1, 3-4, 17, 21; August 5. Hours varied from 0505 to 2215. Four night trips were taken. Total man-hours: 65. **Census:** Song Sparrow, 20 (190, 77); Field Sparrow, 10.5 (100, 40); Com. Yellowthroat, 9 (86, 35); Gray Catbird, 8.5 (81, 33); Yellow Warbler, 6 (57, 23); Red-winged Blackbird, 6; Cardinal, 4 (38, 15); Am. Goldfinch, 4; House Wren, 2.5; Am. Robin, 2.5; Starling, 2; Yellow-breasted Chat, 2; Com. Grackle, 2; Indigo Bunting, 2; Alder Flycatcher, 1.5; Brown-headed Cowbird, 1.5 (females); Rufous-sided Towhee, 1.5; Am. Woodcock, 1; Mourning Dove, 1; Downy Woodpecker, 1; E. Phoebe, 1; Blue Jay, 1; Black-capped Chickadee, 1; Brown Thrasher, 1; Swamp Sparrow, 1; Com. Flicker, 0.5; Hairy Woodpecker, 0.5; Red-tailed Hawk, +; Bank Swallow, +; Wood Thrush, +. **Total:** 30 species; 94.5 territorial males or females (898/km², 363 per 100 acres). **Remarks:** 11 nests were found: Am. Woodcock, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; E. Phoebe, 1; House Wren, 2; Starling, 2; Com. Grackle, 1; Field Sparrow, 1; Song Sparrow, 1. Human disturbance was quite high throughout the summer. Eastern Cottontails and bats were often seen. I wish to thank Susan Blazy and Michael Wilson for helping on two trips, and Joan and Steve Espenschied, whose help was invaluable. — PETER W. WILSON, 821 Pierce Ave. NW, North Canton, Ohio. 44720.

81. 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 Rt 79; 40°11'N, 82°18.5'W, Newark Quadrangle, USGS. **Continuity:** Established 1937; 36 intermittent years. (Formerly listed under 5 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: Several dead trees were downed by high winds. **Weather:** A dry July. **Coverage:** May 23; June 1, 3-4, July 1-2, 25-27; August 13, 20. Total man-hours: 45. **Census:** Acadian Flycatcher, 9 (64, 26); Wood Thrush, 8 (56, 23); Red-eyed Vireo, 8; Am. Robin, 5 (35, 14); Cerulean Warbler, 5; Scarlet Tanager, 5; E. Wood Pewee, 4 (28, 11); Cardinal, 4; Ruby-throated Hummingbird, 3 (21, 9); House Wren, 3; Gray Catbird, 3; Downy Woodpecker, 2; E. Phoebe, 2; Tufted Titmouse, 2; Carolina Wren, 2; Yellow-throated Vireo, 2; Ovenbird, 2; Kentucky Warbler, 2; Brown-headed Cowbird, 2; Chipping Sparrow, 2; Song Sparrow, 2; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Com. Flicker, 1; Red-bellied Woodpecker, 1; Hairy Woodpecker, 1; Great Crested Flycatcher, 1; Blue Jay, 1; Carolina Chickadee, 1; White-breasted Nuthatch, 1; Blue-gray Gnatcatcher, 1; Louisiana Waterthrush, 1; Am. Redstart, 1; N. Oriole, 1; Summer Tanager, 1;

Indigo Bunting, 1; Am. Goldfinch, 1. **Total:** 38 species, 93 territorial males or females (657/km², 266 per 100 acres). **Remarks:** A total of 33 nests was found; 38 species nesting maintains this high statistic; and 93 pairs/35 acres is not unusual. One nest each of Acadian Flycatcher and Red-eyed Vireo contained one cowbird egg. E. Wood Pewees were much below normal density of five pairs and two or more unmated males. The record dry July had no observable effect upon density or nesting success. — A. H. CLAUGUS, 228S. Lake St., Carey, Ohio, 43316.

82. 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:** New. **Size:** 8.26 ha = 20.4 acres (rectangle 130 by 760 yards, surveyed). **Description of Plot:** Long and narrow, equally divided between marsh and forest habitats. The marsh is shallow, heavily vegetated, and dries up in summer between rains. A county drainage ditch runs along one edge of the marsh. The few trees are Black Willow (*Salix nigra*) and hawthorn (*Crataegus*). Shrubs include Am. Elderberry (*Sambucus canadensis*) and Meadowsweet (*Spirea latifolia*). Ground cover is primarily Com. Cattail (*Typha latifolia*), Arrow-leaved Tearthumb (*Polygonum sagittatum*), various sedge and rush species. The forest is composed of two dominant trees, approximately 85% are Black Cherry (*Prunus serotina*) and Red Maple (*Acer rubrum*). Other trees in descending order of frequency include Flowering Dogwood (*Cornus florida*), Apple, Crabapple, White Ash (*Fraxinus americana*), Am. Beech (*Fagus grandifolia*), Tupelo (*Nyssa sylvatica*), White Oak (*Quercus alba*), and Red Oak (*Q. rubra*). These trees are of medium and small size. Understory trees include Arrow-wood (*Viburnum dentatum*) and Buckthorn (*Rhamnus cathartica*). Ground cover varies considerably; it includes Gill-over-the-ground (*Glechoma hederacea*), Field Horsetail (*Equisetum arvense*), Running Ground Pine (*Lycopodium complanatum*), and Enchanter's Nightshade (*Circaeaa quadrifolia*). Transition areas have abundant goldenrod, Touch-me-not (*Impatiens capensis*), and Blackberry (*Rubus frondosus*). One acre of the plot is planted in conservation material including Scotch Pine (*Pinus sylvestris*), Austrian Pine (*P. nigra*), Blue Spruce (*Picea pungens*), and High-bush Blueberry (*Vaccinium corymbosum*). **Edge:** West edge by deciduous woodland, logged at one time; south edge by marsh and woodland; east edge by woodland and cultivated field; north edge by area of human habitation. **Topography:** Marsh is flat; woodland is 15% slope. **Elevation:** 1155 ft. **Weather:** Normal. **Coverage:** April 28-29; May 4, 10-11, 14, 18, 20-24, 26, 28, 30-31; June 1-6, 9-14, 16, 23-25, 27-28; July 7, 21, 28. Almost all field work between 0530 and 1130. On some mornings two trips were made; one at dawn and another at mid-morning. Total man-hours: 76. **Census:** Song Sparrow, 15 (182, 74); House Wren, 7 (85, 34); Red-winged Blackbird, 6 (73, 29); Cardinal, 5 (61, 25); Gray Catbird, 4 (48, 20); Am. Robin, 4; Starling, 4; Indigo Bunting, 4; Mourning Dove, 3 (36, 15); Com. Flicker, 3; Wood Thrush, 3; Brown-headed Cowbird, 3; Am. Goldfinch, 3; Downy Woodpecker, 2; E. Wood Pewee, 2; Blue Jay, 2; Tufted Titmouse, 2; Com. Yellowthroat, 2,

Red-eyed Vireo, 1.5; Scarlet Tanager, 1.5; Field Sparrow, 1.5; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; Red-tailed Hawk, +; Red-bellied Woodpecker, +; Hairy Woodpecker, +; Great Crested Flycatcher, +; Acadian Flycatcher, +; Rose-breasted Grosbeak, +; Rufous-sided Towhee, +; Chipping Sparrow, +. **Total:** 32 species; 81.5 territorial males ($987/\text{km}^2$, 400 per 100 acres). **Remarks:** Actual nests found: House Wren, 4; Com. Flicker, 3; Starling, 3, Downy Woodpecker, 1; Blue Jay, 1; Brown Thrasher, 1; Am. Robin, 1; Wood Thrush, 1; Song Sparrow, 1. Grackles were extremely numerous during the spring and early summer. I was unable to plot territories for them; they seemed to be unmated birds and breeding birds from outside the plot, using the marsh area as a feeding ground. Grackles nesting just outside the plot were highly aggressive and there is probably a correlation between the high frequency of abandoned nests and the intense grackle activity. Fruit production by blueberry, blackberry, wild cherry, etc., was quite heavy this year. There was an explosion in the rabbit population this season. Other numerous mammals were E Chipmunk, Red Squirrel, Fox Squirrel, and Woodchuck. I was aided in the census project by Steve Esenschied and Peter Wilson. — JOAN E. ES-PENSCHIED, 3056 Swamp St., Hartville, Ohio 44632.

83. MOUNTAIN TOP, 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; $40^\circ 07' 20''\text{N}$, $79^\circ 10' 50''\text{W}$, Bakersville Quadrangle, USGS. **Continuity:** New. **Size:** 6.07 ha = 15 acres (rectangular, 500 x 1307 ft with irregular bog areas surrounded by mature edge, measured and calculated). **Description of Plot:** Bog area resulted from lumbering in the early 20th century of original mature stand of trees, whose large water demand kept excessive water from accumulating in a shallow, rocky-bottomed mountaintop depression. When the trees were removed, a highly acid, undrained bog developed. Despite repeated efforts at reforestation with a variety of tree species, only a few stunted evergreens and Black Gums (*Nyssa sylvatica*), survive in the bog — alongside the large stumps of the lumbered forest. Bog area is covered with Sphagnum moss, with tufts of grasses, High Bush Blueberry (*Vaccinium corymbosum*), Large Cranberry (*V. macrocarpum*), Black Huckleberry (*Gaultheria procumbens*), Swamp Dewberry (*Rubus hispida*), Black Chokeberry (*Aronia melanocarpa*), Sundew (*Drosera rotundifolia*), and Pitcher Plant (*Sarracenia purpurea*). Ground cover is essentially 100%; canopy cover none. In the edge area surrounding the bog, various hardwoods and (probably introduced) evergreens grow on higher ground and attempt to invade the bog, with poor success. Here, five 0.1 acre circular samples indicate density of trees, 3 inches in diameter and over (alive and dead) 580/acre; total basal area 107.4 sq ft/acre. Species comprising 98% of the total number of trees: Dead trees 238, 41, 38, 100; White Pine (*Pinus strobus*), 148, 25, 20, 80; Red Maple (*Acer rubrum*), 72, 12, 12, 100; spruce (*Picea sp.*), 36, 6, 6, 40; Sassafras (*Sassafras albidum*), 46, 8, 4, 40; Black Gum, 10, 2, 1, 40; Larch (*Larix laricina*), 10, 2, 6, 40; Red Pine (*Pinus resinosa*), 6, 1, 4, 20; Tulip-tree

(*Liriodendron tulipifera*), 4, 1, 5, 40; Pitch Pine (*Pinus rigida*), 4, 1, -, 20. Trees (alive and dead) by diameter size class: A (3-6 in.) 352, 61, 35.2, 33; B (6-9 in.) 134, 23, 40.2, 37; C (9-15 in.) 86, 15, 17.6, 16; D (15-21 in.) 8, 1, 14.4, 13. Ground cover — 93%, including Mountain Laurel (*Kalmia latifolia*), *Rhododendron maximum*, Witch Hazel (*Hamamelis virginiana*), blueberry (*Vaccinium sp.*), huckleberry (*Gaultheria procumbens*), various ferns, mosses, lycopodium. Canopy cover 38% Canopy height 35 ft, range 30-40 ft. **Edge:** Surrounded on three sides by various hardwoods and evergreens, on one side by bog area. **Topography:** Flat. **Elevation:** 2740 ft. **Weather:** Warm and clear for 8 days, heavy rain 1 day. **Coverage:** June 8-16. Hours: 0500 to 0930, 1200 to 1300, and 1700 to 1930. Total party-hours: 16.9. **Census:** House Wren, 5 (82, 33); Field Sparrow, 5; Chipping Sparrow, 4 (66, 27); Rufous-sided Towhee, 3 (49, 20), Dark-eyed Junco, 3; Song Sparrow, 3; Solitary Vireo, 2.5; Black-capped Chickadee, 2; Cedar Waxwing, 2, Com. Yellowthroat, 2; Veery, 1.5; Am. Robin, 1; Hermit Thrush, 1; Blackburnian Warbler, 1; Canada Warbler, 1; Com. Grackle, 1; Scarlet Tanager, 1; Purple Finch, 1; Magnolia Warbler, 0.5; Red-shouldered Hawk, +; Com. Flicker, +; Blue Jay, +; Com. Raven, +; Com. Crow, +; Gray Catbird, +; Red-eyed Vireo, +; Am. Goldfinch, +. **Total:** 27 species; 40.5 territorial males ($667/\text{km}^2$, 270 per 100 acres). **Remarks:** Three female Brown-headed Cowbirds were observed. Vegetation analysis is courtesy of Mrs. John B. Thorne. The cooperation and assistance of Glen Phillips, the Brooks Bird Club, and Robert Leberman is gratefully acknowledged. — R. CARRELL ABBOTT, 8468 Peebles School Road, Pittsburgh, Pa. 15237.

84. 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; $40^\circ 44' \text{N}$, $79^\circ 42' \text{W}$, Freeport Quadrangle, USGS. **Continuity:** New. **Size:** 10.1 ha = 25 acres (measured with line and compass) **Description of plot:** There is a one acre pond in the NW corner. Huckleberry (*Gaultheria procumbens*), blueberry (*Vaccinium spp.*), and grasses comprise 25% of the vegetative cover, with crabapple (*Pyrus spp.*), Red Maple (*Acer rubrum*) thickets forming islands with some Big-tooth Aspen (*Populus grandidentata*). Ground layer is *Lycopodium*, open areas with goldenrod (*Solidago spp.*) and Birdfoot Trefoil (*Lotus corniculatus*) (introduced as a wildlife food). A quantitative survey of the vegetation gave the following results: Trees (3 inches dbh and over, based on twenty-nine 4 by 25 meter rectangles): 270 trees per acre; total basal area 53.6 sq. ft./acre. Species comprising 90% of the total number of trees: Crabapple 165, 61.6, 32.2, 58.6; Red Maple, 44, 16.4, 32.2, 48.2, Big-tooth Aspen, 18, 6.7, 14.8, 17.2; Black Cherry (*Prunus serotina*), 13, 4.8, 6.8, 24.1; dead snags, 9, 3.4, 2.3, 13.8, hawthorn (*Crataegus spp.*), 5, 1.9, 7.0, 13.8; Shingle Oak (*Quercus imbricaria*), 4, 1.5, 0.8, 10.3; Shagbark Hickory (*Carya ovata*), 4, 1.5, 1.3, 3.4. Trees by diameter size class: A (3-6 in.) 217, 80.4, 21.7, 40.5; B (6-9 in.) 34, 12.6, 10.1, 18.8; C (9-15 in.) 12, 4.4, 9.7, 18.1, D (15-21 in.) 7, 2.6, 12.1, 22.6. **Edge:** Bordered on one side by 20-acre corn field and on other three sides by deciduous woods (primarily second-growth mixed oak)

Topography: Essentially flat. **Elevation:** 1040 ft. **Weather:** Cool with occasional Rain. **Coverage:** May 4, 11, 18, 26; June 1, 5, 10, 12, 18, 24. All censuses between 0500 and 0800 with additional work done during the day. Total man-hours: 60-65. **Census:** Field Sparrow, 6 (59, 24); Red-eyed Vireo, 5 (49, 20); Indigo Bunting, 5; Rufous-sided Towhee, 5; Cardinal, 4 (40, 16), Black-capped Chickadee, 2; Tufted Titmouse, 2; Brown-headed Cowbird, 2; Song Sparrow, 2; Ruffed Grouse, 1; Mourning Dove, 1; Yellow-billed Cuckoo, 1; Ruby-throated Hummingbird, 1; Downy Woodpecker, 1, Gray Catbird, 1; Blue-winged Warbler, 1; Com. Yellowthroat, 1; Yellow-breasted Chat, 1; Scarlet Tanager, 1; Am. Goldfinch, 1; Hairy Woodpecker, +; Am. Robin, +; Ovenbird, +; Vesper Sparrow, +. **Total:** 24 species; 45 territorial males or females ($445/\text{km}^2$, 180 per 100 acres). **Remarks:** Two Cardinal nests found. I thank Brian Donahue for help with the census and the habitat transects, and Paul Wiegman for help getting set up and for reading the manuscript. We used the method described by James and Shugart (AFN 24:727-36, 1970) with slight modification in that we used a straight line instead of circles for the habitat description. — G. THOMAS BANCROFT, RD #3 Cedar Run Road, Alton Park, Pa. 15101.

85. OVERGROWN PASTURE. — **Location:** West Virginia; Ritchie Co., 1 mile SSE of Harrisville on the Robert Cokeley Farm. The centerline starts at $39^{\circ}11'48''\text{N}$, $81^{\circ}02'13''\text{W}$ and extends E, Harrisville Quadrangle, USGS. **Continuity:** New. **Size:** 6.1 ha = 15 acres (rectangular, 110 x 660 yards, measured longitudinally and estimated laterally). **Description of Plot:** An overgrown pasture dominated partially by Smooth Sumac (*Rhus glabra*), thorn bushes (*Crataegus* sp.) and Multiflora Rose (*Rosa multiflora*) among the grasses. This results in 100% ground cover and 0% canopy on five of the six 0.1 acre samples. Shrub count: 5993 stems per acre. Approximately 3 acres have been allowed to grow into relatively mature woodland to control erosion in a steep ravine, so that the following figures apply only to 20% of the plot. Trees 3 inches diameter and over 110/acre, total basal area 124 ft^2/acre . Species comprising 90% of the total number of trees: Am. Beech (*Fagus grandifolia*) 30, 28, 34, 16; Mockernut Hickory (*Carya tomentosa*) 20, 18, 9, 16; Cucumber (*Magnolia acuminata*) 20, 18, 21, 16; Basswood (*Tilia americana*) 20, 18, 21, 16; Red Oak (*Quercus rubra*) 10, 9, 14, 16. Trees by diameter size class: A (3-6 in.) 10, 9, 1, 1; B (6-9 in.) 20, 18, 6, 5; C (9-15 in.) 30, 27, 24, 19; D (15-21 in.) 40, 37, 72, 59; E (21-27 in.) 10, 9, 31, 25. Average canopy height 85 ft. **Edge:** Bordered on all sides by like vegetation. **Topography:** North slope of hillside of about 30 degrees. **Elevation:** Approx. 900 ft. **Weather:** Clear; daytime temperatures in low 70s. **Coverage:** June 2-7. Eleven trips between 0535 and 1130 hours. Total party-hours: 14.4. **Census:** Rufous-sided Towhee, 4 (66, 27), Field Sparrow, 4; Cardinal, 3 (49, 20); Indigo Bunting, 3; Acadian Flycatcher, 2; Brown Thrasher, 2; White-eyed Vireo, 2; Prairie Warbler, 2; Yellow-breasted Chat, 2; Carolina Wren, 1; Blue-gray Gnatcatcher, 1; Red-eyed Vireo, 1; Pileated Woodpecker, +, Downy Woodpecker, +; Great Crested Flycatcher, +, Com. Crow, +; Carolina Chickadee, +; Tufted Tit-

mouse, +; Yellow Warbler, +; Cerulean Warbler, +, Louisiana Waterthrush, +; Red-winged Blackbird, +, Brown-headed Cowbird, +; Am. Goldfinch, +; Chipping Sparrow, +; Song Sparrow, +. **Total:** 26 species, 27 territorial males ($445/\text{km}^2$, 180 per 100 acres)

Remarks: The wisdom of earlier owners in allowing the steep ravine to remain in woodland is readily apparent since it is now mostly stabilized. The woodland species of birds are the result of this conservation practice Field Sparrows, Carolina Wren, Brown Thrasher and Blue-gray Gnatcatcher already had young out of the nest. ESTHER REICHELDERFER, RUTH STROS-NIDER, VIRGINIA JOHNSON and GLEN PHIL-LIPS (compiler), Brooks Bird Club, 707 Warwood Ave., Wheeling, W. Va. 26003.

86. CULTIVATED FIELD AND ABANDONED AIRPORT LANDING STRIP — **Location:** North Carolina; Wilkes Co., 0.5 mile from North Wilkesboro **Continuity:** Established 1959; 16 consecutive years **Size:** 35 acres. The remnant of the 90 acres now in a shopping center. This tract has been surveyed for development but is otherwise undisturbed except for two gravel roads, one running nearly the whole length through the middle of the plot and the other running across it from the long road to the edge of the tract **Description of Plot:** See AFN 13:468, 1959. **Coverage:** April 10, 16, 23, 26; May 6, 13, 22; June 4, 5, 12. **Census:** E. Meadowlark, 4 (28, 11); Song Sparrow, 2; Bobwhite, 1; Red-winged Blackbird, 1; Field Sparrow, 1. **Total:** 5 species; 9 territorial males ($64/\text{km}^2$, 26 per 100 acres). — WENDELL P. SMITH, North Wilkesboro, N.C. 28659.

87. GRASSLAND. — **Location:** North Carolina, Wilkes Co., border of North Wilkesboro. **Continuity:** New. Formerly a corn field and censused for winter population since 1963. **Size:** 100 acres. **Description of Plot:** The tract has been in grass for only two years While in corn few birds nested on it. An old river channel runs through the middle of the area and supports somewhat scattered trees, chiefly Sycamore (*Platanus occidentalis*), Black Willow (*Salix nigra*), and Com. Elder (*Sambucus canadensis*). Remainder in grass and weeds, the latter largely Giant Ragweed (*Ambrosia trifida*). Pigs in varying number range the whole tract throughout the year. The weedy parts were not mowed until late in the season. The edges of the tract bordering the two rivers were not included in the census. Boundaries are Reddies and Yadkin Rivers, a field, and the wooded swamp now in process of development. **Coverage:** April 30; May 6, 11, 17, 20, 27, June 4, 10. **Census:** Song Sparrow, 7 (17, 7); Bobwhite, 4, (10, 4); Cardinal, 4; Mourning Dove, 3, (7, 3); E. Meadowlark, 3; Carolina Wren, 2; Sparrow Hawk, 1, Killdeer, 1; Com. Crow, 1; House Wren, 1; Mockingbird, 1; Red-winged Blackbird, 1; Indigo Bunting, 1, Grasshopper Sparrow, 1. **Total:** 14 species; 31 territorial males ($77/\text{km}^2$, 31 per 100 acres). — WENDELL P. SMITH, North Wilkesboro, N.C. 28659.

88. 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; 4 consecutive years. **Size:** 11.7 ha = 29 acres. **Description of Plot:** See AB 25: 1017, 1971 and 27: 988-989, 1973. **Weather:** Temperature ranged from 56° to 90°F; 7 count days had clear skies, 6 had scattered clouds, and 2 were overcast. **Coverage:** May 13 - June 4; 15 trips of 2 hours each ranging from 0600 to 2000. Total: 30 man-hours. **Census:** E. Meadowlark, 7 (60, 24); Red-winged Blackbird, 7; Bobwhite, 6 (51, 21); Killdeer, 6; Mourning Dove, 5 (43, 17); Blue Jay, 5; Carolina Wren, 5; Mockingbird, 5; Cardinal, 5; Com. Nighthawk, 4 (34, 14); Chimney Swift, 4; Rock Dove, 3 (26, 10); Com. Flicker, 3; Red-bellied Woodpecker, 3; E. Kingbird, 3; E. Wood Pewee, 3; Brown Thrasher, 3; Loggerhead Shrike, 3; House Sparrow, 3; Com. Grackle, 3; Chipping Sparrow, 3; Field Sparrow, 3; Ground Dove, 2; Yellow-billed Cuckoo, 2; Chuck-will's-widow, 2; Great Crested Flycatcher, 2; Com. Crow, 2; Carolina Chickadee, 2; Tufted Titmouse, 2; Am. Robin, 2; E. Bluebird, 2; Red-eyed Vireo, 2; Pine Warbler, 2; Com. Yellowthroat, 2; Indigo Bunting, 2; Rufous-sided Towhee, 2; Am. Kestrel, 1; Sora, 1; Ruby-throated Hummingbird, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Blue-gray Gnatcatcher, 1; Am. Redstart, 1; Orchard Oriole, 1; N. Oriole, 1; Summer Tanager, 1; Blue Grosbeak, 1; Turkey Vulture, +; Red-tailed Hawk, +; Screech Owl, +. **Total:** 50 species; 131 territorial males (1116/km², 452 per 100 acres). **Remarks:** Soras were present throughout the summer. In late 1973 and early 1974 a large barn for showing prize cattle was constructed on the north end of the study area. Plans call for several smaller barns to be built in the same vicinity. Water has been piped to various parts of the area where it stands in open troughs and tanks. — JAMES N. SAPPINGTON, Department of Zoology, Mississippi State University, Mississippi State, Miss. 39762.

89. NORTHERN GRASSLAND. — **Location:** Wyoming; Campbell Co., 16 miles S of Gillette and 6 miles E of Wyoming Highway 59; 44°05'N, 105°20'W; S35, T48N, R71W. USGS-R73336. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangle, Brunton-Pace survey). **Description of Plot:** Grasses dominant. Needle-and-thread grass (*Stipa comata*), Blue Grama (*Bouteloua gracilis*), Cheat Grass (*Bromus tectorum*) most abundant (@ respective composition: 15%, 10%, 25%). Some W. Wheat Grass (*Agropyron smithii*), Crested Wheat Grass (*A. desertorum*), Kentucky Blue Grass (*Poa pratensis*), and Dryland Sedge (*Carex* spp.) present in amounts < 5%. Important forbs are Fringed Sage (*Artemisia frigida*), 5-10% and Scarlet Globemallow (*Sphaeralcea coccinea*), 5-10%. Big Sagebrush (*A. tridentata*) is widely scattered. **Edge:** Similar habitat on all sides. **Topography:** Flat on NW ¼, sloping to a ridge on E and S borders forming a bowl. Some scattered clinker rock outcrop on E side. **Elevation:** 4500 ft. **Weather:** Clear to partly cloudy, winds 10 mph, 35°F-60°F. all coverages. **Coverage:** April 2-5, 18-20; May 7-8; June 5-9. All counts between dawn and 0800 hours. Total man-hours: 30. **Census:** Vesper Sparrow, 4 (49, 20); W. Meadowlark, 3 (37, 15); Horned Lark, 2; Rock Wren, 1. **Total:** 4 species; 10 territorial males (124/km², 50 per 100 acres). **Remarks:** Rock Wrens were confined to the clinker outcrops and are not a

typical grassland breeder. Pronghorns, Whitetail Jackrabbits and cottontails are abundant. An active Badger den is located in the south portion of the plot. The AMAX Belle Ayr Coal Mine is located 1 mile NW. This census is part of an environmental impact study of coal development. Thanks to Ed Keith for help in data collection, and AMAX Coal Company. — JEFFREY W TODD, AMAX Environmental Services Group, 4704 Harlan, Denver, Colo. 80212.

90. SEEDED GRASSLAND. — **Location:** Wyoming, Campbell Co., 16 miles S of Gillette and 4 miles E of Wyoming Highway 59; 44°05'N, 105°25'W; S5, T47N, R71W. USGS-R73336. **Continuity:** New. **Size:** 8.1 ha = 20 acres (rectangle, Brunton-Pace survey). **Description of Plot:** Seeded Crested Wheat Grass (*Agropyron desertorum*) and Wheat Grass (*A. smithii*) are most abundant with some unidentified *Bromus* spp. Approximate grass compositions are 25%, 15%, and 10% for bromes. Fringed Sage appears as a scattered encroaching forb. **Edge:** Similar on all sides. **Topography:** Flat with slight ridge W side. **Elevation:** 4500 ft. **Weather:** Clear to partly cloudy, winds < 10 mph, 35°F-60°F all coverages. **Coverage:** April 1-4, 16-19; May 4-7; June 1-4. All counts between dawn and 0800 hours. Total man-hours: 35. **Census:** Horned Lark, 8 (99, 40), McCown's Longspur, 1. **Total:** 2 species; 9 territorial males (111/km², 45 per 100 acres). **Remarks:** Floating populations of non-territorial Horned Larks disrupted normal territories. This census is part of an environmental impact study of coal development by AMAX Coal Company. This vegetal type represents one of the three major types sampled and shows the greatest abundance of one species — Horned Larks — and the poorest diversity — 2 species. Thanks to Ed Keith and AMAX Coal Company. — JEFFREY W. TODD, AMAX Environmental Services Group, 4704 Harlan, Denver, Colo. 80212.

91. SHORTGRASS PRAIRIE — **Location:** Colorado; Weld Co., 8 miles NNW of Nunn on the Central Plains Experimental Range of the Agricultural Research Service, Pawnee National Grassland; 40°49'N, 104°55'W. **Continuity:** Established 1972; 3 consecutive years. **Size:** 40.7 ha = 100 acres (south block measures 60 x 20 chains, central block 20 x 10, north block 10 x 20, borders are contiguous; blocks marked with grid interval of 2 chains; surveyed with 2-chain tape and staff compass). **Description of Plot:** See AB 26: 975-976, 1972. **Weather:** Average maximum air temperature — June, 97°F. Total precipitation — June 66 mm; 62 mm of rain June 8. **Coverage:** June 5, 12, 19, 26; July 3. All counts began about sunrise and lasted approximately 3 hours. Five different starting points were randomly used. **Census:** Horned Lark, 26 (64, 26); McCown's Longspur, 17.5 (43, 18); Mountain Plover, 3 (7, 3). **Total:** 3 species; 46.5 territorial males (115/km², 47 per 100 acres). **Remarks:** The census of Horned Larks indicates a 4% decrease in the number of territorial males from 1973 (27 males). In 1973 there was an increase of 12% over 1972 (24). McCown's Longspurs have decreased 5% from 1972 to 1973 and from 1973 to 1974. The Mountain Plover has essentially remained stable. Mourning Doves and Lark Buntings were not found as in past censuses. This study was supported in part by

National Science Foundation Grant GB-41233X to the Grassland Biome, U.S. International Biological Program, for "Analysis of Structure, Function, and Utilization of Grassland Ecosystems." The counsel of

Ronald R. Ryder is greatly appreciated. — ROGER L BOYD, Dept. of Zoology and Entomology, Colorado State Univ., Fort Collins, Colo. 80521.

BREEDING BIRD POPULATIONS OF SELECTED GRASSLANDS IN EAST-CENTRAL NORTH DAKOTA — 1974

The following seven 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, Stutsman County, North Dakota. 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 3.93 inches in May and 1.24 inches in June. Temperatures in May were somewhat below normal, with an average high of 60° and an average low of 40° F. June was warmer than usual, with average extremes of 78° and 51° F. In general, windy conditions appeared to be less prevalent than usual.

Because of dry conditions during the previous fall and winter, pond basins were mostly dry in the early spring. Rains in the latter part of May and early June recharged most wetlands, and water conditions remained good throughout the census period.

The censuses following are numbered as in AB:26 (1972), with one Mixed Prairie (VI) not censused this year. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

92. KENTUCKY BLUEGRASS PRAIRIE — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 12, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 3 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 returned to its normal height. Lush stands of Kentucky Blue Grass predominate, with Quack Grass in the low areas. **Coverage:** June 3-5, 10-11, 28. All trips between 0620 and 0955 or 1130 and 1145 hours. Total man-hours: 2.1. **Census:** Bobolink, 2.5, Red-winged Blackbird, 2.5; Marbled Godwit, 1; Short-billed Marsh Wren, 1; W. Meadowlark, 1; Brown-headed Cowbird, 1 (females); Mallard, +; Gadwall, +; Blue-winged Teal, +; N. Shoveler, +; E. Kingbird, +; Grasshopper Sparrow, +. **Total:** 12 species; 9 territorial males or females (185/km², 75 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

93. MIXED PRAIRIE (I) — **Location:** North Dakota; Stutsman Co., NE quarter of Sect. 11, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972 but expanded in size in 1973. **Size:** 10

ha = 24.7 acres (square, 316 m, paced). **Description of Plot:** See AB 26:972, 1972. **Coverage:** June 3-5, 10-11, 25. All trips between 0625 and 1025 hours. Total man-hours: 5.6. **Census:** Clay-colored Sparrow, 7.5 (75, 30), Red-winged Blackbird, 5 (50, 20); Bobolink, 3 (30, 12), W. Meadowlark, 3; Short-billed Marsh Wren, 2.5, Com. Yellowthroat, 2.5; Blue-winged Teal, 2; E. Kingbird, 1.5; Willow Flycatcher, 1; Yellow Warbler, 1, Brown-headed Cowbird, 1 (female); Savannah Sparrow, 1; Am. Coot, 0.5; Mallard, +; Gadwall, +; Pintail, +; Killdeer, +; Com. Snipe, +; Mourning Dove, +, Gray Catbird, +; Baird's Sparrow, +. **Total:** 21 species; 31.5 territorial males or females (315/km², 128 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

94. MIXED PRAIRIE (II) — **Location:** North Dakota; Stutsman Co., SW quarter of Sect. 1, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, surveyed). **Description of Plot:** See AB 26:972-973, 1972. **Coverage:** June 3-5, 10-11, 28. All trips between 0605 and 0930 hours. Total man-hours: 2.5. **Census:** Red-winged Blackbird, 4 (66, 27); Bobolink, 2; W. Meadowlark, 2; Brown-headed Cowbird, 1 (female); Savannah Sparrow, 1; Grasshopper Sparrow, 1; Clay-colored Sparrow, 1; Pintail, +, Blue-winged Teal, +; Killdeer, +; Upland Sandpiper, +; Willet, +; Marbled Godwit, +; E. Kingbird, +. **Total:** 14 species; 12 territorial males or females (197/km², 80 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

95. 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; 3 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, paced). **Description of Plot:** See AB 26:973, 1972. **Coverage:** June 3, 4, 5 (2 trips), 11, 28. All trips between 0525 and 1025 hours. Total man-hours: 3.4. **Census:** Clay-colored Sparrow, 3 (49, 20); Grasshopper Sparrow, 2.5; Baird's Sparrow, 2.5; Bobolink, 1; W. Meadowlark, 1; Red-winged Blackbird, 0.5; Savannah Sparrow, 0.5; Blue-winged Teal, +; E. Kingbird, +; W. Kingbird, +, Brown-headed Cowbird, +. **Total:** 11 species; 11 territorial males (180/km², 73 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

96. MIXED PRAIRIE (IV) — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 11, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:**

Established 1972; 3 consecutive years. **Size:** 6.1 ha = 15 06 acres (square, 247 m, paced). **Description of Plot:** See AB 26:973, 1972. This plot was subjected to a prescribed burn in the fall of 1972. Grasses have regrown since then, but brushy vegetation has not yet returned to its previous stature. **Coverage:** June 4, [10-11, 25 (2 trips)], 28. All trips between 0550 and 0955 hours. Total man-hours: 3.1. **Census:** Red-winged Blackbird, 5.5 (90, 37); Bobolink, 4 (66, 27); W. Meadowlark, 1; Brown-headed Cowbird, 1 (female); Clay-colored Sparrow, 1; Short-billed Marsh Wren, 0.5; Com. Yellowthroat, 0.5; Savannah Sparrow, 0.5; Blue-winged Teal, +; Upland Sandpiper, +; Willet, +; Marbled Godwit, +; E. Kingbird, +; **Total:** 13 species; 14 territorial males or females ($230/\text{km}^2$, 93 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

97. MIXED PRAIRIE (V). — **Location:** North Dakota; Stutsman Co., SE quarter of Sect. 12, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 6.1 ha = 15 06 acres (square, 247 m, paced). **Description of Plot:** See AB 26:974, 1972. In a further effort to reduce brushy vegetation, this plot has been grazed intensively by sheep. Approximately 500 sheep were admitted to the 51 -ha (126-acre) field containing this plot for five weeks in late summer, 1973. One thousand sheep grazed the field May 28 - July 5, 1974, throughout the period of coverage. **Coverage:** June 4, (2 trips), 10 (3), 11 (2), 25 (2). All trips between 0655 and 0950 or 1105 and 1140 hours. Total man-hours: 2.8. **Census:** Clay-colored Sparrow, 2; E. Kingbird, 1.5; W. Meadowlark, 1.5; Brown-headed Cowbird, 1; Killdeer, +; Gray Catbird, +; Brown Thrasher, +; Red-winged Blackbird, +. **Total:** 8 species; 6 territorial males or females ($98/\text{km}^2$, 40 per 100 acres). **Remarks:** A Gadwall nest with 9 eggs was discovered. — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

98. MIXED PRAIRIE (VII). — **Location:** North Dakota; Stutsman Co., NW quarter of NE quarter of Sect. 14, T142N, R68W, New Rockford Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 6.1 ha = 15.06 acres (square, 247 m, paced). **Description of Plot:** See AB 26:974, 1972. **Coverage:** June 4, [10-11, 25 (2 trips)], 28. All trips between 0610 and 1050 hours. Total man-hours: 3.5. **Census:** Red-winged Blackbird, 5.5 (90, 37); Clay-colored Sparrow, 2.5; Bobolink, 2; W. Meadowlark, 1.5; Blue-winged Teal, 1; Wilson's Phalarope, 1; Am. Coot, 1; Savannah Sparrow, 1; Grasshopper Sparrow, 1; Brown-headed Cowbird, 0.5; Chestnut-collared Longspur, 0.5; Red-head, +; Willet, +. **Total:** 13 species; 17.5 territorial males or females ($287/\text{km}^2$, 116 per 100 acres). — DOUGLAS H. JOHNSON, Northern Prairie Wildlife Research Center, Jamestown, N.D. 58401.

99. MIXED PRAIRIE PARK. — **Location:** Nebraska; Lancaster Co., Lincoln, Chet Ager Nature Center, in the SW corner of Pioneers Park. **Continuity:** Established 1971; 4 consecutive years. **Size:** 15.99 ha = 39.5 acres (determined by survey). **Description of Plot:**

See AB 25: 648-649, 1971. **Weather:** Between May 8 and July 9 temperatures ranged from 36 to 104°F. During this period 6.03 inches of precipitation fell, all during the first half of the period. A drought persisted for the last three weeks in June and the first week in July. **Coverage:** May 8, 14, 20, 29; June 18, 26; July 9. One trip between 1300 and 1500, all others between 0830 and 1030. Total man-hours: 10. **Census:** House Wren, 16 (100, 41); Red-winged Blackbird, 11 (69, 28); House Sparrow, 10 (63, 25); Rough-winged Swallow, 6 (38, 15); Brown Thrasher, 6; Am. Robin, 6; Com. Yellowthroat, 6; Brown-headed Cowbird, 6; Cardinal, 6; Black-capped Chickadee, 5 (31, 13); Gray Catbird, 5; N. Oriole, 5; Am. Goldfinch, 5; Mourning Dove, 4 (25, 10); Com. Flicker, 4; Blue Jay, 4; Com. Grackle, 4; Downy Woodpecker, 3 (19, 8); E. Kingbird, 3; Barn Swallow, 3; Starling, 3; Warbling Vireo, 3; Bell's Vireo, 3; Rose-breasted Grosbeak, 3; Indigo Bunting, 3; Red-headed Woodpecker, 2; Orchard Oriole, 2; Yellow-billed Cuckoo, 1; Belted Kingfisher, 1; Yellow Warbler, 1; E. Meadowlark, 1; Dickcissel, 1; Song Sparrow, 1. **Total:** 33 species; 143 territorial males or females; ($894/\text{km}^2$, 362 per 100 acres). **Remarks:** This year's census showed decreases in numbers of breeding pairs over past year's. This decrease is partially owing to the smaller number of count days. We were only able to conduct two coverage days during the month of June which made the accuracy of the census questionable — DARREL GIBLIN and BRYCE ANDERSON, 1215 Arapahoe, Apt. #213, Lincoln, Nebr. 68502.

100. FLOODPLAIN TALL GRASS PRAIRIE —
Location: Kansas; Douglas Co. A portion of Baker Wetlands Research Area (Baker University, Baldwin City, Kansas). It occupies much of the NW 1/4, SW 1/4, Sec 18, T-13N, R-20E, Lawrence East Quadrangle, USGS. **Continuity:** New. **Size:** 10.1 ha = 25 acres (square, measured). **Description of Plot:** Dominated by Prairie Cord Grass (*Spartina pectinata*) which attains a height of 4-5 ft by mid-July. Having a high water table, much of the area has a species composition like a wet meadow Big Bluestem (*Andropogon gerardii*), Switch Grass (*Panicum virgatum*) and Redtop (*Agrostis alba*) are found in portions where cover by Prairie Cord Grass is less than 70%. In many low depressions where water is present until July, Com. Spikerush (*Eleocharis palustris*), is dominant; Baltic Rush (*Juncus balticus*) and Beaked Sedge (*Carex rostrata*) are also commonly found. Dominant forbs on the area include Spiderwort (*Tradescantia virginiana*), Saw-toothed Sunflower (*Helianthus grosseserratus*), Hemp Dogbane (*Apocynum cannabinum*), Com. Milkweed (*Asclepias syriaca*) and Whorled Milkweed (*A. verticillata*). Dense patches of Hoary Vervain (*Verbena stricta*) and Ironweed (*Vernonia baldwinii*) also occur. A row of single, sapling Cottonwood trees (*Populus deltoides*) runs across the southern quarter from east to west. Litter is kept to a minimum by yearly autumn haying of the area and in some years by burning. **Edge:** Bordered on the south by a patch of similar grassland (50 m), on the north by a levee and road which separate the area from a similar grassland that has been allowed to advance into a scrubby successional stage, on the west by another levee and on the east by a cornfield. **Topography:** Essentially flat. **Elevation:** 818 ft

Weather: Normal precipitation patterns in May and June but extremely dry in July. **Coverage:** May 19, 23, 26, 29; June 17, 19, 21, 26. All trips between 0630 and 1000 hours. Total man-hours: 18. **Census:** Dickcissel, 10 (99, 40); Red-winged Blackbird, 7 (69, 28); Com. Yellowthroat, 4 (40, 16); E. Meadowlark, 4. **Total:** 4 species; 25 territorial males ($247/\text{km}^2$, 100 per 100 acres). **Remarks:** Nests found: Dickcissel, 7; Red-winged Blackbird, 5; Com. Yellowthroat, 2; E. Meadowlark, 2. Vertical vegetation density was measured in each of the bird's territories using the methods of Wiens (A.O.U. Monog. No. 8, 1969). The vertical density profiles obtained where cordgrass cover was over 80% were very much like those obtained by Post (Ecology 55:569-570, 1974). In May the mean number of contacts per 10 cm interval was greatest at approximately 8 cm height. At this time only the ground-nesting meadowlarks had nests with eggs and these were predominantly in past years' growth. By June however, the mean number of contacts per 10 cm interval was greatest at 55 cm height. At this time all the other species were nesting. Heavy rains and predation accounted for the majority of nest losses. My thanks to Ivan Boyd of Baker University for permission to use this area for study. — CALVIN L. CINK, *Museum of Natural History, University of Kansas, Lawrence, Kans. 66045.*

101. SANDHILL PRAIRIE. — **Location:** Kansas; Harvey Co., Sand Prairie Natural History Reservation, 4 miles E and 4 miles N of Burton; E $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 36, R3W, T22S; 38°5'N, 97°36'W. **Continuity:** New. (Summary of earlier censuses published in this issue.) **Size:** 32.38 ha = 80 acres (rectangle, 440 x 880 yards, measured). **Description of Plot:** See article this issue. **Weather:** Cloudy to partly cloudy on 5 of 8 censuses; light to moderate winds; flooding of wetlands was maximum during most of the nesting season. **Coverage:** May 1, 25, 29; June 4, 11, 18, 25, 28. All trips were between 0610 and 0915 hours. Total man-hours: 63. Additional twice-weekly visits were made through the summer. **Census:** Mourning Dove, 11 (34, 14); N. Oriole, 8 (25, 10); Field Sparrow, 8; House Wren, 6 (19, 8); Red-winged Blackbird, 5 (15, 6) (7 females); Brown-headed Cowbird, 5 (females); E. Kingbird, 4 (12, 5); Com. Grackle, 4; Yellow-billed Cuckoo, 3 (9, 4); Orchard Oriole, 3; Cardinal, 2.5; Am. Bittern, 2; Bobwhite, 2; Blue Jay, 2; Brown Thrasher, 2; Com. Yellowthroat, 2; Barn Swallow, 1.5; Pied-billed Grebe, 1; Green Heron, 1; Blue-winged Teal, 1; Mallard, 1; Com. Flicker, 1; Great Crested Flycatcher, 1; Gray Catbird, 1; Am. Goldfinch, 1; E. Meadowlark, 0.5. **Total:** 26 species; 79.5 territorial males (or females) ($246/\text{km}^2$, 99 per 100 acres). **Remarks:** 74 nests were found: Green Heron, 2; Am. Bittern, 2; Blue-winged Teal, 1; Mallard, 1; Mourning Dove, 24; Yellow-billed Cuckoo, 1; E. Kingbird, 4; Blue Jay, 2; Brown Thrasher, 1; House Wren, 1; Red-winged Blackbird, 11; Com. Grackle, 5; Orchard Oriole, 6; N. Oriole, 8; Cardinal, 2; Field Sparrow, 3. Although not more than 1/5 of the area was flooded, 36 of the nests were in trees, shrubs or sedges over water. Three new species, Am. Bittern, Green Heron and Am. Goldfinch, nested this year, bringing the total to 41. Ring-necked Pheasant, Blue-gray Gnatcatcher, Bell's

Vireo and Dickcissel, that had been regular nesters, were not present and Com. Yellowthroat and Orchard Oriole had substantial declines. The House Wren had a dramatic increase from the low populations of the last few years. Com. Grackles nested in larger numbers than in any previous year. — DWIGHT R. PLATT, *Dept. of Biology, Bethel College, North Newton, Kan. 67117.*

102. VIRGIN TALLGRASS PRAIRIE. — **Location:** Oklahoma; Washington Co., from intersection of US 75 and Oklahoma 23A at south edge of Bartlesville, 1 mile S and 3 miles E and 1/2 mile S; center at 95°52'30"W, 36°41'18"N, Bartlesville South Quadrangle, 7.5 min. series USGS, within section 36-26-13. **Continuity:** New. **Size:** 68.8 ha = 170 acres (irregular rectangle, approx. 1/4 x 3/4 mi, measured using aerial photo).



Census 102. View over prairie showing complete cover of grasses, legumes and forbs.

Description of Plot: Prairie summit, 1/2 mile from nearest road, bounded on W by section line fence, on S and E by moderate to steep drop from summit crest, on NW by lake edge, on NE by drainage gully into lake; virgin tallgrass prairie pasture, 99.5+ % ground cover, consisting of 85% grasses, 13% legumes and forbs and about 1-2% shrubs, bare erosion area 30 x 80 ft where gully empties into lake. Principal grasses are Little Bluestem (*Andropogon scoparius*), Big Bluestem (*A. gerardi*), Switch Grass (*Panicum virgatum*) and Indian Grass (*Sorghastrum nutans*). Twelve-inch tall Wild Oats (*Avena fatua*), Wild Alfalfa (*Psoralea tenuiflora*) and Prairie Acacia (*Acacia angustissima*) are the principal plants on the high ridge where soil is shallow limestone-base (20% of the plot). Soil on 80% of the plot consists of shallow to moderately deep loam weathered from sandstone and shale and supports lush tall grasses 2 to 3 ft tall by June even with cattle grazing. Principal legumes besides above-mentioned are Blue False Indigo (*Baptisia australis*), Leadplant (*Amorpha canescens*), and Illinois Mimosa (*Desmanthus illinoensis*). Principal forbs are Evening Primrose (*Oenothera* sp.), Purple Coneflower (*Echinacea* sp.), ragweed (*Ambrosia* sp.), Yarrow (*Achillea millefolium*), Daisy Fleabane (*Erigeron annuus*) and goldenrod (*Solidago* sp.); grasses in smaller amounts

are Virginia Wildrye (*Elymus virginicus*), Sideoats Grama (*Bouteloua curtipendula*) and Prairie Cord Grass (*Spartina pectinata*). Woody shrub thickets 2 to 4 ft tall are mostly False Indigo Bush (*Amorpha fruticosa*) with a few Chickasaw Plum (*Prunus angustifolia*), blackberry (*Rubus* sp.), Winged Sumac (*Rhus copallina*) and Redbud (*Cercis canadensis*); 2 thickets 30-40 ft diameter are 6-7 ft tall Chickasaw Plum. 5 trees: 4 Honey Locust (*Gleditsia triacanthos* f. *triacanthos*) 8, 10, 15 & 20 ft tall, 1 Redbud (*Cercis canadensis*) 8 ft. **Edge:** Surrounded by 2500 acres of similar habitat uncut by roads, 1/2 of 1 side lake shore. **Topography:** Summit plus gentle northern slope (mostly 3-5% grade, rarely up to 10%), contains 2 drainage gullies that empty into lake. **Elevation:** 770 to 810 ft. **Weather:** Dry and mild through April, very wet in May and early June, clear to partly cloudy count days; temperature 45-80°; wind 2-5 mph, extreme 15 mph. **Coverage:** April 24, 26; May 1, 6, 10, 20, 27; June 10-12. April and May trips between dawn and 1130 hours CDT, June half-trips 1800-2000 hours, CDT. Total man-hours: 41. **Census:** Grasshopper Sparrow, 84 (122, 49); Dickcissel, 78 (113, 46); E. Meadowlark, 33 (48, 19); Red-winged Blackbird, 8 (12, 5); Brown-headed Cowbird (female), 5 (7, 3); E. Kingbird, 4 (6, 2); Greater Prairie Chicken (female), 2; Killdeer, 2; Scissor-tailed Flycatcher, 1; Bell's Vireo, 1; Orchard Oriole, 1; Henslow's Sparrow, 1; Field Sparrow, 1. Total 13 species; 224 territorial males or females (326/km², 132 per 100 acres). **Remarks:** Nine nests located: Dickcissel, 3; E. Kingbird, 2; Greater Prairie Chicken, 1; Scissor-tailed Flycatcher, 1; Orchard Oriole, 1. A photograph of Henslow's Sparrow taken on the plot May 10, 1974, established the first valid record of *Ammodramus henslowii* in Oklahoma, although nesting was not proved. Other animals seen on the plot: Striped Skunk, Coyote and Ornate Box Turtle; Hereford Cattle, 1 per 10 acres, grazing after mid-April. Special thanks to Ella Delap for invaluable suggestions, encouragement and help with census; to Richard Kane for permission to census his land; to Joe Smith, for advice on locating plot; to Calvin Wood, District Soil Conservationist for Wash. Co., for help in plant identification. — DOTTY M. GOARD, 2117 S. Dewey, Bartlesville, Okla. 74003.

103. RESTORED TALL-GRASS PRAIRIE. — **Location:** Wisconsin; Dane Co., University of Wisconsin Arboretum's Curtis Prairie S of L. Wingra on the SW side of Madison; 43°2'N, 89°26'W, Madison West Quadrangle, USGS. **Continuity:** New. **Size:** 8.8 ha = 21.7 acres (rectangular, 300 x 350 yd, laid out with compass and 50-yd cord) selected from a larger 17 ha = 42-acre tract of prairie with irregular boundaries. **Description of Plot:** The area was burned in the spring, according to the university's prairie-management plan. Prairie grasses, Big Bluestem (*Andropogon gerardi*), Little Bluestem (*A. scoparius*), and Indian Grass (*Sorghastrum nutans*) were as yet short and sparse. Prairie forbs including the goldenrods (*Solidago* spp.) are frequent as are Prairie Dock (*Silphium terebinthinaceum*), Compass Plant (*S. laciniatum*), Rattlesnake Master (*Eryngium yuccifolium*), and Spiderwort (*Tradescantia ohiensis*). The taller vegeta-

tion (to 4 ft) consists of Wild Indigo (*Baptisia leucantha*) spread throughout the study area in the drier habitat and Reed Canary Grass (*Phalaris arundinacea*) in moist, poorly drained areas. Wild Parsnip (*Pastinaca sativa*) and Kentucky Blue Grass (*Poa pratensis*) occur almost everywhere as prairie weeds. This was the status of the prairie as of July 1; two weeks later during the goldfinch census the prairie's seasonal succession had progressed to favor taller herbs and forbs. The area contains a single stand of five 30-ft-tall Bur-oaks (*Quercus macrocarpa*). A graveled fire lane runs the length of the tract, from N to S, separating the eastern 1/3 of the tract. Some narrow, grassy footpaths traverse the area. There is a pond of about 1/3 acre in a south-central location. **Edge:** Bounded to the E and W by similar prairie. To the S are 100 yd of prairie and then mature pine plantings with some oaks and shrubs. To the N is another 25 yd of prairie followed by an area of medium height trees and shrubs and the arboretum's horticultural nursery. **Topography:** The generally flat terrain is poorly drained through much of its central area. **Elevation:** 880 ft. **Weather:** Generally warm with occasional morning fog and evening rainstorms. **Coverage:** June 18-July 1, 15, 17, 19; generally from 0445 to 0900 daily with 4 trips at 2000 during the second week of observation. Total man-hours: 55 for 42-acre coverage. **Census:** Red-winged Blackbird, 18 (205, 83), Com. Yellowthroat, 10.5 (120, 48); Song Sparrow, 5.5 (63, 25); Willow Flycatcher, 4 (46, 18); E. Meadowlark, 3 (34, 14); Am. Goldfinch, 3; Blue-winged Teal, 1, Ring-necked Pheasant, 1; Short-billed Marsh Wren, 1, Bobolink, 1; Brown-headed Cowbird, 1. **Total:** 11 species; 49 territorial males (558/km², 226 per 100 acres). **Remarks:** Adult cowbirds (2 males, 3 females) were seen only once; however, 2 young were observed being fed by a pair of Red-winged Blackbirds. Female pheasants were not observed, in part owing to the late date of the census. The total area censused included 42 acres of prairie with 86 territorial males (506/km², 205 per 100 acres). Field maps of these observations have been filed with the Managing Director of the University of Wisconsin Arboretum, Madison. Arboretum Journal Paper No. 88. Special thanks to J. J. Hickey for his direction. — MICHAEL D. DRESEN, 2811 Andes Drive, Madison, Wis. 53719.

104. MAINTAINED INVADED GRASSLAND. — **Location:** Indiana; Newton Co., Willow Slough Fish and Wildlife Area, 2.5 miles W of Enos; 41°00'55"N, 87°29'47"W, Enos Quadrangle, USGS. **Continuity:** New. **Size:** 9.17 ha = 22.67 acres (3 rectangles — 615 x 700 ft, 515 x 400 ft and 390 x 900 ft — west to east along a road to the south of the plot, surveyed with a hand-held compass and measured tape). **Description of Plot:** The main plant community consists of grasses and other non-woody vegetation. Clumps of Black Cherry (*Prunus serotina*) saplings are found throughout the plot. White Oak (*Quercus alba*) saplings are less common. Quantitative results are given for five randomly selected 0.1 acre plots resulting in the following: No trees greater than 3 in.; 1 dead trunk, F (27-33 in.), shrub stems/acre: 5600; ground cover, 93%; canopy cover, 1%; average canopy height, 8 ft (range 0-15 ft) On the five samples the average height of the non-

woody plants was approximately 20 in. **Edge:** The eastern two-thirds of the north and all the east edges are early second growth forest. The rest of the north and all the west edges are similar to the plot. The south edge is bounded by an asphalt road. Both sides of the road have similar habitat. **Topography:** Little change in elevation, with a downward slope toward the middle and southward, and a small hill near the southwest corner. **Elevation:** 670 ft. **Weather:** June was unusually wet, cloudy and windy. July was clear and unusually dry. **Coverage:** May 28; June 15; July 6-7, 14, 27; between dawn and 1130 or 1730 and 2115. Total man-hours: 12 censusing and 7 surveying, laying out the grid and taking 0.1 acre flora samples. **Census:** Com. Yellowthroat, 15 (163, 66); Field Sparrow, 15; E. Meadowlark, 7 (76, 31); Henslow's Sparrow, 7; Song Sparrow, 7; Am. Goldfinch, 6 (65, 26); Grasshopper Sparrow, 5 (54, 22); Bobwhite, 3 (33, 13); Gray Catbird, 3; Brown-headed Cowbird, 3; Indigo Bunting, 2; E. Kingbird, 1.5; Bell's Vireo, 1+; Screech Owl, 1; Short-billed Marsh Wren, 1; Yellow-breasted Chat, 1; Orchard Oriole, 1; N. Oriole, 1; Dickcissel, 1; Whip-poor-will, +; Com. Flicker, +; Cardinal, +. **Total:** 22 species; 81.5 territorial males or females ($888/\text{km}^2$; 360 per 100 acres). **Remarks:** The plot was chosen from an area which is managed for pheasant and quail. In particular, no plowing was evidenced until the end of July this year. At that time, saplings were clear cut on 8 acres at the northwest corner, a 20 x 1000 ft strip was plowed and planted in buckwheat along the road to the southeast and zig-zag mowing was employed to the north of the plowed strip. This activity did not affect this year's count with the possible exception of the Am. Goldfinch. The hill near the southwest corner contains the remains of an old homestead, and several mature Black Walnut and Red Mulberry trees now exist there. Otherwise, the habitat over the plot was essentially the same. The soil is sandy and the drainage is to the south. White-tailed Deer, Cotton-tail Rabbits and Woodchuck were also seen. — EDWARD M. HOPKINS, 1150 Windsor Dr., West Lafayette, Ind. 47906.

105. 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; $36^{\circ}48'N$, $95^{\circ}58'W$, Tulsa Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 40.47 ha = 100 acres (irregular rectangle roughly 600 x 800 yards) determined from SCS aerial map. **Description of Plot:** See AB 26: 976-977, 1972. **Weather:** Wet and mild. **Coverage:** April 13, 19, 22-25; May 4, 10, 15, 27; June 9, 14, 24, 29; July 4. One trip from 1045 to 1530, one from 1550 to 1900, all others between 0555 and 1150. Total man-hours: 55. **Census:** Indigo Bunting, 18.5 (46, 19); Blue-gray Gnatcatcher, 14 (35, 14); Red-winged Blackbird, 12 (30, 12); Com. Yellowthroat, 10.5 (26, 11); Cardinal, 10 (25, 10); Dickcissel, 7 (17, 7); Brown-headed Cowbird, 6 (15, 6); Yellow-billed Cuckoo, 4.5 (11, 5); Tufted Titmouse, 4.5; Downy Woodpecker, 4 (10, 4); Carolina Chickadee, 4; E. Wood Pewee, 3.5 (9, 4); Ruby-throated Hummingbird, 3 (7, 3); Red-bellied Woodpecker, 3; Painted Bunting, 3; Am. Goldfinch, 3; Field Sparrow, 3; Great Crested Flycatcher, 2.5; Summer Tanager, 2.5; Blue Jay, 2; E.

Bluebird, 2; Red-eyed Vireo, 2; Kentucky Warbler, 2; Yellow-breasted Chat, 2; Red-headed Woodpecker, 1.5; White-breasted Nuthatch, 1.5; House Wren, 1.5; Lark Sparrow, 1.5; Green Heron, 1; Com. Flicker, 1; E. Phoebe, 1; Carolina Wren, 1; Bell's Vireo, 1; N. Parula 1; E. Meadowlark, 1; Bobwhite, 0.5; Barred Owl, 0.5; Belted Kingfisher, 0.5; Acadian Flycatcher, 0.5; Orchard Oriole, 0.5; Great Blue Heron, +; Red-shouldered Hawk, +; Hairy Woodpecker, +; Com. Crow, +. **Total:** 44 species; 144 territorial males ($356/\text{km}^2$, 144 per 100 acres). **Remarks:** Dumping and trespassing have almost stopped because of extra vigilance by the property owners, and the area is becoming wilder. Shrubby habitat increased because there was no mowing or burning, and the tops of 22 Black Walnut trees, cut for lumber in February, were left where they fell. A major flood in the county in mid-March created four more acres of wetland. The Indigo Bunting population returned to its 1972 level. New species were the House Wren and Warbling Vireo. Blue-gray Gnatcatchers increased to 14 (7 last year). Nine gnatcatcher and 2 cardinal nests were found. — ELLA DELAP, 409 N. Wyandotte, Dewey, Okla. 74029.

106. FLOODPLAIN POND. — **Location:** Colorado, Weld Co., about 6 miles S and 1.5 miles E of Johnstown. Parts of Sects. 34 & 35, T4N, R67W. $40^{\circ}52'N$, $40^{\circ}15'W$, Milliken Quadrangle, USGS. **Continuity:** New. **Size:** 8.5 ha = 21 acres (measured from an aerial photo with a planimeter). **Description of Plot:** Approximately 50% open water with three large peninsulas extending into the center of the pond. Smartweed (*Polygonum* sp.) is the most abundant vegetative species forming large, pure stands. Softstem Bulrush (*Scirpus validus*) and willow (*Salix* sp.) which are mostly decendent occur in sparse stands. Cattail (*Typha latifolia*) dominates the ends of two peninsulas. Canary Reed Grass (*Phalaris arundinacea*) and Tall Wheat Grass (*Agropyron elongatum*) occur along the banks. **Edge:** Bordered on south, east, and north by floodplain cottonwood forest and on the west by hayland and agricultural land. **Topography:** Roughly circular in shape; banks are steep and about 3 to 8 ft high; mean depth is approximately 4 ft. **Elevation:** 4790 ft. **Weather:** Mostly clear, dry, and warm throughout census period. **Coverage:** May 5, 12, 19, 26; June 2, 9, 16, 23, 30; July 7, 15. All trips between sunrise and 0630. Total man-hours: 6. **Census:** Yellow-headed Blackbird, 28 (329, 133); Red-winged Blackbird, 12 (141, 57); Com. Yellowthroat, 3 (35, 14); W. Meadowlark, 1. **Total:** 4 species; 44 territorial males ($518/\text{km}^2$, 210 per 100 acres). **Remarks:** Area was drained from late May through June, 1973 and essentially abandoned during that time; consequently, no comparative data are available. Yellow-headed Blackbirds occupied two peninsulas while Red-winged Blackbirds established territories along the periphery of the pond. Censuses were conducted from a road encompassing the perimeter of the pond. The study area was established to evaluate the effects of the Fort St. Vrain Nuclear Generating Station on the surrounding area. The pond will act as an intermediate holding location for blow-down water from the cooling towers when the station becomes operative. Special thanks to Greg and Nancy Warren

for their assistance. — BRUCE R. JOHNSON,
*Department of Fishery and Wildlife Biology, Colorado
State University, Fort Collins, Colo. 80521.*

107. DISTURBED FLOODPLAIN WOODLAND. —

Location: California; Butte Co., a remnant of dense riparian growth bordering the Sacramento River, 5.75 miles W of Chico; 39°42'N, 121°56'W, Chico Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 11.4 ha = 28.1 acres (a roughly triangular-shaped peninsula formed by the merging of Big Chico Creek and the Sacramento River). **Description of Plot:** See AB 26:978-979, 1972. **Weather:** On April 2 the Sacramento River was at flood stage and the entire plot was under six feet of water. Within two weeks, however, the plot was free of water. Precipitation for the period, in inches, is as follows: April, 1.62 (.01 last yr.), May, .27 (.66 last yr.), June, .27 (.17 last yr.). (Data from National Weather Service). Weather during the period was rather cool and mild until late May when days of 100°F+ temperature began. **Coverage:** April 2, 17, 19, 25, 30; May 9-10, 13, 16, 20, 23, 28; June 29. Total census hours: 30. All censuses between 0630 and 1200. **Census:** Bewick's Wren, 18 (158, 64); Black-headed Grosbeak, 18; Rufous-sided Towhee, 12 (106, 43); N. Oriole, 11 (97, 39); W. Wood Pewee, 7 (62, 25); Nuttall's Woodpecker, 5 (44, 18); Ash-throated Flycatcher, 5; Plain Titmouse, 5; Brown-headed Cowbird, 5; Lesser Goldfinch, 5; Downy Woodpecker, 4 (35, 14); Scrub Jay, 4; Am. Robin, 4; Yellow Warbler, 4; Am. Goldfinch, 4; California Quail, 3 (26, 11); Mourning Dove, 3; Starling, 3; Tree Swallow, 2; Com. Bushtit, 2; Brown Towhee, 2; W. Kingbird, 1; Lazuli Bunting, 1; House Finch, 1; Red-shouldered Hawk, +; Yellow-billed Cuckoo, +; Black Phoebe, +; Lark Sparrow, +. **Total:** 28 species; 129 territorial males or females (1134/km², 459 per 100 acres). **Remarks:** Nests found: N. Oriole, 4; Black-headed Grosbeak, 4; Downy Woodpecker, 2; Am. Robin, 2; Lesser Goldfinch, 2; Nuttall's Woodpecker, 1; W. Kingbird, 1; Plain Titmouse, 1. Fledglings noted: Plain Titmouse, Starling, N. Oriole, House Finch, Lesser Goldfinch. One or two Yellow-billed Cuckoos were heard during June and probably nested in the vicinity. Northern Orioles have increased steadily: from 5 pairs in 1972, 7 pairs in 1973, to 11 pairs this year. American Goldfinches, not present in 1972, increased from 3 pairs in 1973 to 4 pairs this year. The male House Sparrow, observed once, was unusual since there are no human habitations in the area; two were seen last year on nearly the same date. Special thanks to Tim Manolis for his assistance with this project. — PETER METROPULOS, 336 Chesterton Avenue, Belmont, Calif. 94002.

108. OAK-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; 3 consecutive years. **Size:** 4 ha = 10 acres (irregular, measured). **Description of Plot:** See AB 26:979, 1972. **Weather:** See Census 125. **Coverage:** March 24; April 10, 19; May 15, 26; June 11. Total

man-hours: 20. Trips made between 0700 and 1800 hours. **Census:** Song Sparrow, 6 (148, 60); Wilson's Warbler, 5 (124, 50); Orange-crowned Warbler, 4 (111, 45); Com. Bushtit, 4 (99, 40); Winter Wren, 4; Swainson's Thrush, 4; Western Flycatcher, 3 (74, 30); Am. Robin, 3; Chestnut-backed Chickadee, 2.5; Bewick's Wren, 2; Warbling Vireo, 2; Brown-headed Cowbird, 2; Black-headed Grosbeak, 2; Purple Finch, 2; Pine Siskin, 2; Rufous-sided Towhee, 2; Wrentit, 1.5; California Quail, 1; Com. Flicker, 1; Downy Woodpecker, 1; Olive-sided Flycatcher, 1; Violet-green Swallow, 1; Steller's Jay, 1; Scrub Jay, 1; Brown Towhee, 1; Great Horned Owl, +; Anna's Hummingbird, +; Allen's Hummingbird, +; Tree Swallow, +; Cliff Swallow, +; W. Bluebird, +; Am. Goldfinch, +; White-crowned Sparrow, +. **Total:** 33 species; 59.5 territorial males (1470/km², 595 per 100 acres) **Remarks:** Nests found (9): Bewick's Wren (1); Com Flicker (1); Warbling Vireo (1); Purple Finch (1); Bushtit, (3); W. Bluebird (1); Chestnut-backed Chickadee (1). Contribution No. 93, PRBO. — ROBERT M STEWART, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

109. RIPARIAN WOODLAND. California. Unfortunately the manuscript for this census mysteriously disappeared somewhere in the mail between editors in Oregon, Maryland, and New York, and there is no record of the address of the author, whose name is believed to be McKinney. If the author will send us a duplicate manuscript, it will be published in a subsequent issue.

110. SYCAMORE - COAST LIVE OAK RIPARIAN WOODLAND. — **Location:** California; Orange Co., on the Starr Ranch Audubon Sanctuary, in Bell Canyon, 4.5 miles SE of Trabuco Oaks Post Office; 33°35'30"N, 117°34'W, Canada Gobernadora Quadrangle, USGS. **Continuity:** New. **Size:** 10.9 ha = 27 acres (rectangular, 157m x 697m = 515 x 2287 ft; measured by commercial Rolla-tape measuring wheel). **Description of Plot:** See AB, 28: 715-16, 1974. The winter census plot was modified to increase uniformity. The present plot is part of a canyon-bottom riparian woodland with an intermittent stream along the western boundary. Water is usually present after the first heavy rains of December and remains through July or August. A N-S dirt road runs through the middle of the plot. Sycamore (*Platanus racemosa*) and Coast Live Oak (*Quercus agrifolia*) are the only canopy species. Principal shrubs in order of relative frequency are California Sagebrush (*Artemesia californica*), White Sage (*Salvia apiana*), Laurel Sumac (*Rhus laurina*), Prickly Pear Cactus (*Opuntia* sp.), Elderberry (*Sambucus mexicana*), and Lemonadeberry (*Rhus integrifolia*). Willow and Mulefat (*Baccharis* sp.) grow in and beside the streambed. Standing and fallen dead sycamores and oaks are found throughout the plot. The trees and shrubs tend to grow in scattered clumps separated by open, grass-covered spaces. A section of approximately 3 acres at the north end is covered with a dense growth of oaks. This is the only well-shaded portion of the plot. A thick growth of several unidentified grasses covers most of the plot. A quantitative survey gave the following results. Trees, 3

inches diameter and over, based on ten 0.1 acre circular samples, 43/acre; total basal area 66.5 square feet/acre. Species comprising 100% of the total number of trees (figures after each give number of trees/acre, relative density in percent, relative dominance and relative frequency in that sequence): Sycamore, 37, 86, 46, 60; Coast Live Oak, 5, 12, 47, 30; dead trees, 1, 2, 7, 10. Trees by diameter size class (figures after each class give number of trees/acre, relative density in percent, basal area in square feet/acre, relative dominance in percent): A (3-6 in.) 13, 30, 2.6, 2; B (6-9 in.) 8, 19, 4.8, 4; C (9-15 in.) 9, 21, 14.4, 11; D (15-21 in.) 3, 7, 10.8, 8; E (21-27 in.) 3, 7, 18.6, 14; F (27-33 in.) 4, 9, 39.2, 29; G (33-40 in.) 3, 7, 42.6, 32. Shrub stems/acre: 7950; Ground cover 96%; Canopy cover 30.5%; Average canopy height 48 ft (range 42-60). Edge: Bordered to the east by a gentle slope covered with a scattered growth of White Sage, California Sagebrush, Laurel Sumac, Coast Live Oak and Sycamore. Farther up the east slope is a vast open meadow. Contiguous riparian woodland lies to the north and south. Topography: Flat. Elevation: 650 ft. Weather: During the census period daytime temperatures were mild, with highs ranging from the low 60s to the high 70s. Around 0.25 in. of precipitation fell during the period. Coverage: May 3, 9-10, 12, 16, 20, 26-27; June 1, 3. All trips between 0530 and 1100 hours PST, averaging 4½ hours/trip. An additional trip of approximately 6 hours was made to locate cavity nests and count California Quail. Total man-hours: 51. Census: California Quail females, 19 (174, 70); Starling, 18 (165, 67); House Wren, 14 (128, 52); Brown Towhee, 10.5 (96, 39); Ash-throated Flycatcher, 7 (64, 26); Mourning Dove, 6 (55, 22); Plain Titmouse, 6; Scrub Jay, 5.5 (50, 20); Com. Bushtit, 5 (46, 19); Bewick's Wren, 3.5 (32, 13); Acorn Woodpecker, 3 (27, 11); W. Bluebird, 3; Com. Flicker, 2.5; Nuttall's Woodpecker, 2.5; Rufous-sided Towhee, 2.5; Anna's Hummingbird, 2; N. Oriole, 2; Lesser Goldfinch, 2; Am. Kestrel, 1.5; Barn Owl, 1; Black-chinned Hummingbird, 1; Cactus Wren, 1; House Finch, 1; Rufous-crowned Sparrow, 1; White-breasted Nuthatch, 0.5. Total: 25 species; 121 territorial males or females ($1107/\text{km}^2$, 448 per 100 acres). Remarks: Nests (55) of the following species were located: Starling, 18; House Wren, 11; Brown Towhee, 4; Acorn Woodpecker, 3; Mourning Dove, 2; Com. Flicker, 2; Ash-throated Flycatcher, 2; Plain Titmouse, 2; Com. Bushtit, 2; W. Bluebird, 2; Am. Kestrel, 1; Barn Owl, 1; Bewick's Wren, 1; Cactus Wren, 1; House Finch, 1; Rufous-sided Towhee, 1; Rufous-crowned Sparrow, 1; 43 nests were located in cavities, 6 were on the ground or less than 2 ft high, 6 were more than 2 ft high. Excluding California Quail, 62% of the territorial males were cavity nesters. All 46 cavity nests were located in sycamores, thus emphasizing the importance of this tree. The large population of Starlings may be lowering the number of successful woodpecker nestings. Only 3 of the 18 Starling nests were found in natural holes or crevices. The remaining 15 were in cavities excavated by woodpeckers. Other vertebrates seen were: California Toad, Pacific Tree-frog, Side-blotched Lizard, W. Fence Lizard, Striped Racer, Gopher Snake, Audubon's Cottontail, California Ground Squirrel, Desert Woodrat, California Meadow Mouse, Coyote,

Bobcat, Mule Deer. The remains of the Desert Shrew, Botta Pocket Gopher, W. Harvest Mouse, Deer Mouse, and Dusky-footed Woodrat were found in Barn Owl pellets. — DAVID R. BONTRAGER, Dept. of Biology, Calif. State Univ., Long Beach, 6101 E. 7th St., Long Beach, Calif. 90840.

111. SYCAMORE-COAST LIVE OAK RIPARIAN WOODLAND. — Location: California; Los Angeles Co., Tapia Park, 9 miles E of intersection of Malibu Canyon Road and Coast Highway 1; $118^\circ 40' \text{W}$, $34^\circ 42' \text{N}$, Malibu Coast Quadrangle, USGS Continuity: New. Size: 8.49 ha = 20.97 acres (irregular rectangle, 1538 x 616 ft., measured with a commercial wheel-type rotating tape). Description of Plot: Composed of two specific woodlots divided by a paved access road. The woodlot west of the road is predominantly W. Sycamore (*Platanus racemosa*) averaging 35 ft in height and 29 in. dbh. Of the 126 trees in this woodlot 7 are cultivated pine averaging 15 ft in height and 17 in. dbh. There is no ground cover probably owing to the number of people using it for recreation and trampling the natural vegetation. The woodlot east of the road has entirely Coast Live Oak (*Quercus agrifolia*) as its canopy tree. These trees average 40 ft in height and 32 in. dbh. The areas where oak is not growing is covered by Coastal Sage (*Artemisia californica*), White Sage (*Salvia apiana*) and Buckwheat (*Eriogonum fasciculatum*). This area covers about 15-20% of the eastern woodlot area. Edge: Bordered on the west by Malibu Creek and by a low scrub habitat consisting of Coastal Sage, White Sage, and Buckwheat on the remaining three edges. Topography: Flat with a 100 ft high hill at the western edge and two 15 ft hills at the southern end. Elevation: 500 ft. Weather: Warm (60°F) and overcast throughout census period Coverage: May 26-31; June 3-4. All trips between 0630 and 1100 hours. Total man-hours: 26. Census: Plain Titmouse, 5 (59, 24); Starling, 5; Lesser Goldfinch, 5, Brown Towhee, 5; House Finch, 4 (47, 19); Scrub Jay, 3 (35, 14); Com. Bushtit, 3; Orange-crowned Warbler, 3, Brewer's Blackbird, 3; Mourning Dove, 2; Anna's Hummingbird, 2; Downy Woodpecker, 2; W. Bluebird, 2; Dark-eyed Junco, 2; Nuttall's Woodpecker, 1; Ash-throated Flycatcher, 1; Com. Crow, 1; Bewick's Wren, 1; Yellow Warbler, 1; N. Oriole, 1; Black-headed Grosbeak, 1; Rufous-sided Towhee, 1. Total: 22 species; 54 territorial males or females ($636/\text{km}^2$, 258 per 100 acres). Remarks: Nests found (6): Nuttall's Woodpecker (1); Com. Crow (1); W. Bluebird (1); Starling (3) Mammals seen on every trip were California Ground Squirrel, and Botta Pocket Gopher. The Ground Squirrel population was very large with many juveniles, and it was impossible to walk 100 ft without disturbing one or two that were foraging. — IAN R. McKINNIE JR., 1663 Julianne Place, Santa Rosa, Calif. 95404.

112. FLOODPLAIN COTTONWOOD FOREST. — Location: Colorado; Jefferson Co., about 10 miles SW of Denver on west bank of S. Platte R., 2 miles upstream from its confluence with Plum Creek and about 4 miles downstream from where the river exits from the foothills of the Rocky Mountains onto the high plains,

NE/4, Sec. 14, T6S, R69W, 6th P.M.; 39°32'N, 105°5'W, Littleton Quadrangle, USGS. **Continuity:** Established 1971; 4 consecutive years. **Size:** 9.7 ha = 24 acres. **Description of Plot:** See AB 25: 966-967, 1971. **Weather:** Dry to mid-June; very hot late June and July. **Coverage:** March 10, 19; April 12-14, 24; May 1, 8, 15, 22, 25, 29; June 1, 5, 12, 19, 26; July 2-3, 10, 17, 24-25, 31, Aug. 7, 14. Times varied from 0615 to 2015 hours; most trips from 1700 to 2000. Total man-hours: 46. **Census:** House Wren, 34 (350, 142); Great Blue Heron, 21 (216, 87); Yellow Warbler, 19 (196, 79); Am. Robin, 12 (124, 50); Mourning Dove, 11 (113, 46); Starling, 6 (62, 25); Warbling Vireo, 6; N. Oriole, 6; Downy Woodpecker, 5 (51, 21); Red-eyed Vireo, 5; Com. Yellowthroat, 4 (41, 17); Lazuli Bunting, 4; E. Kingbird, 3 (31, 12); Am. Goldfinch, 3; Am. Kestrel, 2; Black-billed Magpie, 2; Rufous-sided Towhee, 2; Great Horned Owl, 1; Broad-tailed Hummingbird, 1; Com. Flicker, 1; Black-capped Chickadee, 1; Gray Catbird, 1; Yellow-breasted Chat, 1; Indigo Bunting, 1. **Total:** 24 species, 152 territorial males ($1565/\text{km}^2$, 633 per 100 acres). Excluding the colonial nesting herons, 131 territorial males ($1349/\text{km}^2$, 546 per 100 acres). **Remarks:** The grove suffered an unexpected change this year. When the cottonwoods leafed out in late May, we found that 75 trees on the west side had died. Apparently a normal water table for cottonwoods is down about 5 ft. The water table on the west measured 35 ft, and 11 ft on the northeast. We attribute the low water table to the gravel mining operation, which pumped out water to gain access to gravel deposits. While the spring weather was quite dry, no other groups of cottonwoods along the river suffered a like fate. Upon notification of this occurrence, the Corps of Engineers had the gravel contractor pump water onto the surface in the grove. The trees within the normal runoff pattern from the pipe outlet, covering about 5 acres, retained normal leafing and stayed green throughout the census period. However during the pumping other trees not benefited began to lose their leaves, and the canopy thinned throughout the rest of the grove. The Corps extended the irrigation using sprinklers, particularly in the vicinity of the herony trees. This additional sprinkling, which continued from July 29 to Aug. 9, arrested the denuding process, but whether or not the trees have survived will not become evident until next year. Chatfield Dam is not yet finished, so the reservoir waters have not yet flooded the grove. The net result of the lowered water table is to kill the trees earlier than might have otherwise occurred, and to kill them from lack of water instead of from flooding. The dryness also affected the understory — thistles and hemlocks weakened and died early, even though vigorous plants existed upstream, away from the gravel mining. This year we counted more heron nests than in any previous year. Although on April 14 we counted 16 nests plus one under construction, by July 10, 21 nests had 65 young. The most striking feature of this summer was the total absence of W. Wood Pewees. They have steadily declined from 20 territorial males in 1971 to last year's 9, and this year's none. Others totally absent were Lesser Goldfinch and Song Sparrow. Compared with the three-year average, populations of seven other species dropped, nine increased, and eight remained the same. We found a total

of 54 nests, including 21 heron, 11 House Wren, 5 robin, 3 Starling, 2 each of kestrel, dove, magpie, and oriole, and 1 each of owl, Downy Woodpecker, E. Kingbird, Warbling Vireo, and Rufous-sided Towhee. — RICHARD L. BOTTOFF, NANCY HURLEY, URLING KINGERY, DOUGLAS STOTZ, JO TRAINOR, and HUGH KINGERY (compiler), 869 Milwaukee St., Denver Colo. 80206.

113. FLOODPLAIN COTTONWOOD FOREST. —

Location: Colorado; Weld Co., on the west bank of the South Platte River about 6 miles S and 1.5 miles E of Johnstown. The study area extends from the confluence of the St. Vrain Creek and South Platte River south about 3/4 miles. Parts of Sects. 34 & 35. T4N, R67W, 40°21'N, 104°14'W, Milliken Quadrangle, USGS. **Continuity:** Established 1973. **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, warm to hot throughout census period; summer abnormally dry. **Coverage:** May 5, 12, 19, 26; June 2, 9, 16, 23, 30; July 7, 15. All trips between sunrise and 0915. Total man-hours: 24.5. **Census:** House Wren, 35 (67, 27); Starling, 12 (23, 9), Com. Yellowthroat, 8 (15, 6); Mourning Dove, 4 (8, 3), Com. Flicker, 4; Red-winged Blackbird, 4; Am. Robin, 3 (6, 2); E. Kingbird, 2; W. Meadowlark, 2; Am. Kestrel, 1; Great Horned Owl, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1. **Total:** 13 species; 78 territorial males ($150/\text{km}^2$, 61 per 100 acres). **Remarks:** Comparisons with 1973 data revealed that the numbers of territorial birds increased for nine species, decreased for one, and remained unchanged for four. Species having largest increases were House Wrens from 27 in 1973 to 35 in 1974, Starlings from 4 to 12, Com. Yellowthroats from 3 to 8, Red-winged Blackbirds from 0 to 4, and Com. Flickers from 1 to 4. Northern Orioles declined from 2 in 1973 to 0 in 1974 although they remained occasional visitors. Total territorial males increased from 47 to 78. Flooding and an abnormally cold spring may have, in part, accounted for low numbers in 1973. Comparisons with 1972 data show the largest increases in numbers of House Wrens from 22 in 1972 to 35 and Starlings from 0 to 12. The largest decreases were in Black-capped Chickadees and N. Orioles, both from 4 to 0. Other fluctuations were minor. — BRUCE R. JOHNSON, Department of Fishery and Wildlife Biology Colorado State University, Fort Collins, Colo 80521.

114. CALIFORNIA-BAY – BISHOP PINES – MIXED FOREST. — Location: California; Marin Co., 0.5 miles S. of Inverness; 38°03'N, 122°50'W, Inverness Quadrangle, USGS. Continuity: Established 1972; 3 consecutive years. Size: 11.7 ha = 29 acres (approximately rectangular, 900 x 1500 ft, measured). Description of Plot: See AB 26: 981, 1972. Weather: High fog on 2 mornings but otherwise sunny and clear with no wind. Coverage: March 15; April 15, 17, 25; May 21, 28; June 9. All trips between 0700 and 1230 hours. Total man-hours: 28. Census: Western Flycatcher, 8 (68, 28); Brown Creeper, 7 (60, 24); Purple Finch, 6.5 (55, 22); Chestnut-backed Chickadee, 5 (43, 17); Com. Bushtit, 5; Wilson's Warbler, 5; Rufous-sided Towhee, 5;

Orange-crowned Warbler, 4.5 (38, 16); Pine Siskin, 4 (34, 14); Hutton's Vireo, 3.5 (30, 12); Hermit Thrush, 3 (26, 10); Swainson's Thrush, 3; Dark-eyed Junco, 3; Acorn Woodpecker, 2; Hairy Woodpecker, 2; Steller's Jay, 2; California Quail, 1; Mourning Dove, 1; Anna's Hummingbird, 1; Downy Woodpecker, 1; Violet-green Swallow, 1; Wrentit, 1; Winter Wren, 1; Bewick's Wren, 1; Golden-crowned Kinglet, 1; Am. Goldfinch, 1; Song Sparrow, 1; Warbling Vireo, 0.5; Turkey Vulture, +; Allen's Hummingbird, +; Tree Swallow, +; Com. Raven, +; White-breasted Nuthatch, +. **Total:** 33 species; 80 territorial males ($682/\text{km}^2$, 276 per 100 acres). **Remarks:** Nests found (14): Brown Creeper (5); Chestnut-backed Chickadee (2); Hairy Woodpecker (1); Downy Woodpecker (1); Steller's Jay (1); Com. Bushtit (1); Orange-crowned Warbler (1); Wilson's Warbler (1); Dark-eyed Junco (1). There has been a decline in the total number of territorial males from 114 in 1972, 88.5 in 1973 to 80 in 1974. Contributing to the decline from 1973 to 1974 was the Wilson's Warbler, 13 to 5, and the Warbling Vireo, 5 to 0.5. Pygmy Nuthatch was not recorded even as a visitor this year after previous years of 5 and 0.5 territorial males. A plausible explanation for the general decline in numbers of birds was the abnormally wet, and cold winters of 1972-73 and 1973-74, although last winter was not as severe as the previous one. However, during last winter 2 live Bishop Pines, 2 Bishop Pine snags, 6 California Bays and 1 Coast Live Oak were down. During the spring a live Tan Bark Oak fell. Thanks to Jacqueline and Gordon Ford for permission to continue this census on their property in the Nature Conservancy Bishop Pine Preserve. Contribution No. 99, PRBO — ROBERT M. STEWART, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

115. PONDEROSA PINE – SCRUB OAK – MOUNTAIN-MAHOGANY WOODLAND. — **Location:** Colorado; Douglas Co., 1 mile E of Franktown, on Highway # 86; $39^\circ 20' \text{N}$, $104^\circ 40' \text{W}$, Elizabeth Quadrangle, USGS. **Continuity:** Established 1968; 7 consecutive years. **Size:** 8.09 ha = 20 acres (surveyed; a trapezium, 453.70 ft on the north, 607.36 ft on the south along Highway #86, 1096.40 ft on the east, 1649.90 ft on the west). **Description of Plot:** See AFN 22: 673, 1968. **Weather:** April was warm, May was warm and dry. On June 8 there was a 12-in. snow that stayed $2\frac{1}{2}$ days. Then again more very hot and dry weather. **Coverage:** May 31; June 15, 25; July 3, 11, 19, 26; August 2, 10, 18. Trips varied from 0800 to 2030 hours. Total man-hours: 40 for the 10 trips. **Census:** Western Bluebird, 10 (124, 50); House Finch, 4 (49, 20); W. Wood Pewee, 3 (37, 15); Chipping Sparrow, 3; Virginia's Warbler, 2; Black-headed Grosbeak, 2; Rufous-sided Towhee, 2; White-breasted Nuthatch, 1; Pygmy Nuthatch, 1; Mountain Bluebird, 1; Solitary Vireo, 1. **Total:** 11 species; 30 territorial males ($371/\text{km}^2$, 150 per 100 acres). **Remarks:** There were 25 nests in boxes; 9 other nests were found. Eight bluebird boxes had 5 eggs each, four had 4 eggs each, two had 3 eggs each, four had 2 eggs each and one had only 1 egg, predators got the 1-egg and 2-egg boxes. Out of the 95 eggs, 39 fledged. — MILDRED O. SNYDER, *161 Del Mar Circle, Aurora, Colo. 80011.*

116. BISHOP PINE FOREST. — **Location:** California; Marin Co., Point Reyes National Seashore, 1.7 miles W of Inverness, 1.1 miles NW of Mt. Vision, $38^\circ 06' \text{N}$, $122^\circ 52' \text{W}$, Drakes Bay Quadrangle USGS. **Continuity:** New. **Size:** 6.23 ha = 15.4 acres (irregular, determined from field measured scale and aerial photograph). **Description of Plot:** A virtually pure Bishop Pine (*Pinus muricata*) forest composed of stands of varying ages probably owing to presence of fire in some sections at several intervals in the past. A 1.5 acre stand is composed of young pines with a mean trunk diameter of approximately 7.5 inches at the southern end and more mature trees in the northern third. Other stands are more uniformly aged. The point quarter method (*Ecology* 37: 451-460, 1956) was used to determine species composition. The relative density and importance value is given for each species. Bishop Pine 94,278; Madrone (*Arbutus menziesii*) 3,7; Wax Myrtle (*Myrica californica*) 2,10; Tanbark Oak (*Lithocarpus densiflora*) 1,5. The understory was estimated as Salal (*Gaultheria shallon*) 60%, Bracken Fern (*Pteridium aquilinum*) and Sword Fern (*Polystichum munitum*) 12%, California Huckleberry (*Vaccinium ovatum*) 7%, Canyon Gooseberry (*Ribes menziesii*) 7%, *Baccharis pilularis* 5%, grasses and other herbaceous plants, 5%, bare ground or pine litter 4%. The Salal, almost absent in the one acre of immature Bishop Pine, increased in density and height in the more mature stands. It attained a height of over six feet and completely impeded passage in some sections. **Edge:** Bounded on the north by similar habitat, on the south and west by meadow, and on the east by a brushy slope. **Topography:** Fairly steep S-E facing slope. **Elevation:** 800-1000 ft. **Weather:** Ranged from cool and foggy to clear and warm. Area is subject to rapid weather changes from prevailing NW coastal winds. Most of plot was protected from direct contact with these winds. **Coverage:** April 11, 18, 26, May 10, 17, 24; June 7. Hours between 0530 and 1130 with most censusing between 0600 and 1000. Total man-hours: 36. **Census:** Wrentit, 5.5 (88, 36); Purple Finch, 5 (80, 32); Pine Siskin, 5; Chestnut-backed Chickadee, 4 (64, 26); Wilson's Warbler, 4; Rufous-sided Towhee, 4; Western Flycatcher, 3 (48, 19); Song Sparrow, 2.5; Com. Bushtit, 2; Winter Wren, 2; Am Goldfinch, 2; Dark-eyed Junco, 2; Orange-crowned Warbler, 1.5; White-crowned Sparrow, 1.5; Hairy Woodpecker, 1; Tree Swallow, 1; Bewick's Wren, 1; California Quail, +; Anna's Hummingbird, +; Allen's Hummingbird, +; Olive-sided Flycatcher, +; Violet-green Swallow, +; Am. Robin, +; Swainson's Thrush, +; Hutton's Vireo, +. **Total:** 27 species, 53 territorial males ($850/\text{km}^2$, 344/100 acres). **Remarks:** A 1.5 acre burn of ground vegetation is planned by the National Park Service to determine if Bishop Pine germination will be stimulated by the elimination of the dense Salal and other vegetation which have thrived in the absence of natural fires in the area. The 15.4 acre plot size surrounds and includes the proposed burn site. The size was a result of the decision to avoid the edges of differing habitat and include only one dominant vegetation type. Thanks to Dick Brown of the Point Reyes National Seashore Headquarters and Howard Cogswell for crucial advice, frequent assistance, and aerial photography. — WALLACE RAVVEN, *999 Campus Drive, Aptos, Calif. 95003.*



Census 117. Bishop Pine forest showing pine that fell in spring 1974. Photo / Nick Story.

117. BISHOP PINE FOREST. — **Location:** California; Marin Co., on Point Reyes National Seashore, 1.5 miles W of Inverness, 0.75 miles NW of Mt. Vision; 38°06'N, 122°52'W, Drakes Bay Quadrangle, USGS. **Continuity:** Established 1972; 3 consecutive years. **Size:** 8.5 ha = 21 acres (irregular, approximately 700 x 1100 ft, measured). **Description of Plot:** See AB 985-986, 1972. **Weather:** For the second year in a row winter temperatures were below normal, winter and spring precipitation above normal. Only one census day was without clouds or fog; all census days were windy (up to 30 mph), and roughly 50% of the census hours had complete overcast, fog, drizzle, or rain. **Coverage:** April 17, 26; May 4, 15, 22, 29, 30; June 3-4, 22. Trips varied between 0500 and 2030 hours, most lasting from early morning until mid-afternoon. Total census-hours: 55. **Census:** Wrentit, 11.5 (135, 55); Allen's Hummingbird, 10 (females) (118, 48); Wilson's Warbler, 8.5 (100, 40); Pine Siskin, 4.5 (53, 21); Rufous-sided Towhee, 4 (47, 19); Western Flycatcher, 3.5 (41, 17); Swainson's Thrush, 3.5 (41, 17); Purple Finch, 3.5 (41, 17); Com. Bushtit, 3 (35, 14); Am. Goldfinch, 3; Chestnut-backed Chickadee, 2.5; Hutton's Vireo, 2.5; Dark-eyed Junco, 2.5; Mourning Dove, 1.5; Hairy Woodpecker, 1.5; Bewick's Wren, 1.5; Winter Wren, 1; California Quail, 0.5; Steller's Jay, 0.5; Com. Raven, +; Brown Creeper, +; Orange-crowned Warbler, +; Red Crossbill, +. **Total:** 23 species; 69 territorial males and females (812/km², 329 per 100 acres). **Remarks:** Nests found (9): Allen's Hummingbird (5); Com. Bushtit (1); Hutton's Vireo (1); Am. Goldfinch (1); Dark-eyed Junco (1). It is interesting to note that only 1 male Allen's Hummingbird territory was found. The number of territorial males for 1972-1973-1974 has been 77-66-53, excluding Allen's Hummingbird (female territories not determined in previous censuses), Swainson's Thrush (1972 census ended too early), and Am. Goldfinch (another late breeder). Major drops in resident populations of Chestnut-backed Chickadee, Pygmy Nuthatch, Purple Finch, and Dark-eyed Junco account for most of the decline in numbers of territorial males, and were experienced throughout the Point Reyes Peninsula; the extremely cold, wet winter of 1972-1973 is generally

believed to have been a major factor. Special thanks to Bob Stewart for consultation during this study. Contribution No. 98, PRBO. — LARRY KIRKENDALL, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

118. BISHOP PINE FOREST. — **Location:** California; Marin Co., 3.75 miles WNW of Inverness; 38°37'N, 122°53'W, Drakes Bay Quadrangle USGS. **Continuity:** Established 1952 (1951); 6 intermittent years. **Size:** 10.5 ha = 26 acres (irregular, measured). **Description of Plot:** See AFN 6: 313, 1952 and AB 26: 986, 1972. **Weather:** Foggy in early mornings on most census days. **Coverage:** March 19; April 11, 27, 29-30; May 7, 13, 16, 24, 31; June 4. All between 0700 and 1600 hours. Total man-hours: 45. **Census:** Pine Siskin, 11.5 (109, 44); Wrentit, 9 (86, 35); Dark-eyed Junco, 9; Wilson's Warbler, 7 (67, 27); Purple Finch, 5.5 (52, 21); Western Flycatcher, 5 (48, 19); Chestnut-backed Chickadee, 5; Hutton's Vireo, 5; Rufous-sided Towhee, 5; Song Sparrow, 5; Pygmy Nuthatch, 4 (38, 15); Brown Creeper, 4; Bewick's Wren, 3.5 (33, 13); Hairy Woodpecker, 3 (29, 12); Com. Bushtit, 3; Swainson's Thrush, 3; Violet-green Swallow, 2; Tree Swallow, 2; Winter Wren, 2; Am. Goldfinch, 2; Chipping Sparrow, 2; White-crowned Sparrow, 2; Steller's Jay, 1; Scrub Jay, 1; Allen's Hummingbird, 1; Orange-crowned Warbler, 1; Olive-sided Flycatcher, 0.5; Great Horned Owl, +; Mourning Dove, +; Am. Robin, +. **Total:** 30 species: 104 territorial males (988/km², 400 per 100 acres). **Remarks:** The winter of 1973-74 was colder and wetter than normal, but not as intense as the previous winter. Three live Bishop Pines (30-50 ft tall) and one large snag fell during the winter. During early spring seven inches of rain in a week and high winds downed 6 live pines (24-60 ft) and one 75 ft snag in the northwestern portion of the plot. Nests found (18): Chestnut-backed Chickadee (5); Pygmy Nuthatch (3); Tree Swallow (2); Brown Creeper (2); Dark-eyed Junco (2); Hairy Woodpecker (1); Violet-green Swallow (1); Bushtit (1); Pine Siskin (1). A female Red-Crossbill was seen carrying nest material on April 29. The average number of territorial males increased from 75.9 in 1951-53 to 98 in 1972-74; an increase of 22.1. If we divide the birds into categories based on where they nest (ground, shrub, tree branches, and tree cavities), we find the following changes in numbers of birds by 1972-74: ground - 0.5; shrub +20.9; tree branches +6.3; tree cavities - 4.6. The Chestnut-backed Chickadee, dropping from 8.5 to 4.7, accounted for most of the decrease in cavity-nesting species. The increase in branch-nesting species was owing mostly to the Purple Finch, up 3.9, and the Pine Siskin, up 4.3. The substantial increase in shrub-nesting species suggests that the understory is now denser than it was in the early 1950s. Norris made a 1000-foot plant transect in 1951, but, since he did not record its location, we cannot make a new transect for comparison. We can, however, suggest an explanation for a change in the density of plant growth. The beginning of Norris's census coincided approximately with the establishment of Tomales Bay State Park. He reported that horses grazed on approximately one-third of the plot and that deer were commonly seen. The removal of horses from an area would likely be accom-

panied by an increase in density of understory plants. We saw very few deer and no horses during 1972-74. Among shrub-nesting species, the Wrentit, increasing from 1 to 8.7, and the Wilson's Warbler, up from 4.5 to 8.5, showed the most significant changes in numbers. In 1972-74, we saw several species not present in 1951-53: Com. Bushtit, Swainson's Thrush, Am. Goldfinch and Chipping Sparrow, (all shrub dwellers), Downy Woodpecker, Tree Swallow, Olive-sided Flycatcher, Winter Wren, Starling, and Orange-crowned Warbler. Not observed in 1972-74 although present in 1951-53 were the Brown Towhee and Saw-whet Owl; the latter, however, could have easily been overlooked. Contribution No. 97. PRBO.— ROBERT M. STEWART and PAMELA KRUSKALL, *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°04'N, 122°51'W, Inverness Quadrangle, USGS. **Continuity:** Established 1972; 3 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:** Mostly clear on census days, sometimes foggy or overcast; temperatures mild throughout the census period. Heavy storms in the winter of 1973-74 had blown down about 50 Bishop Pines; the plot is exposed to winds from the west, off the Pacific Ocean, and from the north, off Tomales Bay. **Coverage:** March 16, 24, 31; April 10, 14, 17, 26; May 3, 11, 14, 24; June 8-9. Trips during all daylight hours, mainly mornings, except one evening visit in search of owls (none were found). Total census-hours (daylight): 57. **Census:** Allen's Hummingbird, 21 (175, 71); Wrentit, 15 (125, 50); Purple Finch, 8 (67, 27); Pine Siskin, 8; Wilson's Warbler, 7.5 (62, 25); Swainson's Thrush, 6 (50, 20); Pygmy Nuthatch, 5.5 (46, 19); Orange-crowned Warbler, 5.5; Western Flycatcher, 5 (42, 17); Violet-green Swallow, 5; Chestnut-backed Chickadee, 5; Bewick's Wren, 5; Rufous-sided Towhee, 5; Com. Bushtit, 4 (33, 13); Brown Creeper, 4; Hutton's Vireo, 4; Hairy Woodpecker, 3 (25, 10); Steller's Jay, 3; Dark-eyed Junco, 3; Song Sparrow, 2; Mourning Dove, 1; Com. Flicker, 1; Tree Swallow, 0.5; Hermit Thrush, 0.5. **Total:** 24 species; 127.5 breeding males or pairs (1061/km², 429 per 100 acres). **Remarks:** In the description of the plot (1972) the manzanita was erroneously identified as *Arctostaphylos virgata* instead of *A. columbiana*. In 1972 (AB 26: 985), the Spotted Owl identification is now thought to be incorrect. Allen's Hummingbirds have been conspicuously present in large numbers each year of this census, but this is the first report to be based on a special count of hummingbirds (on March 3, at the height of their breeding season), and corroborated by subsequent observations. Allen's Hummingbird turned out to be the most numerous species; it was found scattered throughout the plot, mainly in the vicinity of Pink-flowering Currant (*Ribes sanguineum*). This year the Starling made its debut on the plot as a visitor. The breeding season in this area is so long — some larger birds beginning in January, thrushes not becoming fully active until June — that it is difficult to count all breeding species with equal accu-

racy in a four-month census. Fewer breeding species were reported this year because some species (Turkey Vulture, Red-tailed Hawk, Band-tailed Pigeon, and Com. Raven) reported in 1973 as having less than half a territory were visitors this year. In 1973 we reported a decrease in the breeding population with 20 out of 27 species showing losses. In 1974, 15 of 24 breeding species increased their numbers. Only one species, Wrentit, decreased (down to 15 pairs from 19.5 in 1973). While 12 species failed to regain the population level reported in 1972, 8 species surpassed the 1972 level. This year's total breeding population of 106.5 pairs (excluding Allen's Hummingbirds for a more accurate comparison with previous years) is higher than the 1973 figure of 86 but lower than the 1972 figure of 119.5. Contribution No. 96, PRBO.— HELEN STORY and NICK STORY, *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, about 0.5 miles E of east gate to Lake Ranch, Point Reyes National Seashore, 37°58'N, 122°45'W, Double Point Quadrangle, USGS. **Continuity:** Established 1972; 3 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. Many Monterey Pines seeded in 1958 are now 40-55 ft tall. **Weather:** Normally fog or low overcast (showers one morning) and cold winds; the fog often lifted or burned off by afternoon. Only 2 days and one evening were clear and warm. Winter temperatures were below normal, winter and spring precipitation above normal. **Coverage:** March 21; April 15, 18, 25, May 2-3, 11, 21, 29; June 3, 17. Trips varied between 0530 and 2100 hours, usually from early morning until mid-afternoon. Total man-hours: 62. **Census:** Wrentit, 11 (135, 54); Wilson's Warbler, 9.5 (116, 47); Rufous-sided Towhee, 6.5 (80, 32); Swainson's Thrush, 5 (61, 25); Orange-crowned Warbler, 5; California Quail, 4 (49, 20); Chestnut-backed Chickadee, 4; Pygmy Nuthatch, 3.5 (43, 17); Hutton's Vireo, 3.5; Violet-green Swallow, 3 (37, 15); Com. Bushtit, 3; Bewick's Wren, 3; Purple Finch, 3; Hairy Woodpecker, 2; Western Flycatcher, 2; Steller's Jay, 2; Starling, 2; Pine Siskin, 2; Mourning Dove, 1.5; Purple Martin, 1; W Bluebird, 1; Black-headed Grosbeak, 1; Song Sparrow, 1; Com. Flicker, 0.5; Acorn Woodpecker, 0.5; Band-tailed Pigeon, +; Allen's Hummingbird, +; Pileated Woodpecker, +; Olive-sided Flycatcher, +; Scrub Jay, +; Brown Towhee, +. **Total:** 31 species; 81 territorial males (991/km², 401 per 100 acres). **Remarks:** Nests found (14) — Violet-green Swallow (3); Pygmy Nuthatch (3); Starling (2); Hairy Woodpecker (1), Steller's Jay (1); Purple Martin (1); Com. Bushtit (1), W. Bluebird (1); Orange-crowned Warbler (1). The number of territorial males has been remarkably constant over three years (79, 81, 81). The avian community seems to have been little affected by the last two relatively harsh winters. No positive sightings were made of female Allen's Hummingbirds; juveniles were seen in two different areas on the fringes of the plot, male territories were found within the census area

Many thanks to Bob Stewart for aid and encouragement. Contribution No. 95, PRBO. — LARRY KIRKENDALL, *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; 4 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, ranging from clear and warm to cool and windy. Early morning fog and drizzle for three census days, heavy fog for two. **Coverage:** April 1, 3, 11, 17, 20-21, 27; May 9-10, 24-26; June 1-2, 6, 13. All trips between 0530 and 1600 hours except for 2 between 1930 and 2130. Total man-hours: 60. **Census:** Wilson's Warbler, 8.5 (139, 56); Wrentit, 4 (65, 26); Rufous-sided Towhee, 4; Song Sparrow, 4; Pine Siskin, 3.5 (57, 23); W. Flycatcher, 3 (49, 20); Chestnut-backed Chickadee, 3; Golden-crowned Kinglet, 3; Bewick's Wren, 2.5; Purple Finch, 2.5; Brown Creeper, 2; Swainson's Thrush, 2; Orange-crowned Warbler, 2; Dark-eyed Junco, 2; Allen's Hummingbird, 1; Hairy Woodpecker, 1; Steller's Jay, 1; Red-breasted Nuthatch, 1; Hermit Thrush, 1; Hermit Warbler, 1; Am. Robin, 0.5; Winter Wren, +; Warbling Vireo, +. **Total:** 23 species; 52.5 territorial males ($856/\text{km}^2$, 347 per 100 acres). **Remarks:** Five nests found: Brown



Census 121. Hazelnut and Sword Fern under towering Douglas Fir. Photo / Nick Story.

Creeper, 2; Hairy Woodpecker, 1; Chestnut-backed Chickadee, 1; Wilson's Warbler, 1. Although dominated by Douglas-fir, the plot contains a lush under-story, which accounts for the high number of such species as Wrentit, Song Sparrow, and Wilson's Warbler. Two new species appeared this year: Swainson's Thrush and Hermit Warbler. Otherwise, species composition was almost the same as last year except for the absence of Pygmy Nuthatch and Bushtit. The number of female Allen's Hummingbirds was not estimated since they are difficult to distinguish from young birds in the field. Many thanks to Bob Stewart and Phil Henderson for consultation during this study. Contribution No. 94, PRBO. — ELLERY AKERS, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

122. PONDEROSA PINE FOREST. — **Location:** Colorado; Boulder, in the lower foothills 0.5 mile S of Baseline Road, in the eastern part of Section 1, T1S, R71W, 6th Principal Meridian, Boulder County. **Continuity:** Established 1954; 11 intermittent years. **Size:** 8.09 ha = 20 acres (rectangular, surveyed). **Description of Plot:** See AFN 8:372, 1954. **Weather:** Boulder had an unusually dry and hot spring. May was the driest on record, with many days of 90° or more during June and July. **Coverage:** March 31; April 21, 28; May 5, 12, 26-27; June 6, 9, 16, 23; July 4, 7, 28; August 4. All trips between 0630 and 0930. Total man-hours: 17½. **Census:** W. Wood Pewee, 15 (185, 75); Chipping Sparrow, 9 (111, 45); Mourning Dove, 6 (74, 30); Am. Robin, 6; Solitary Vireo, 5 (62, 25); Pygmy Nuthatch, 4 (49, 20); Mountain Chickadee, 3 (37, 15); Broad-tailed Hummingbird, 2; White-breasted Nuthatch, 2; W. Tanager, 2; Gray-headed Junco, 2; House Wren, 1; Black-headed Grosbeak, 1; Pine Siskin, 1. **Total:** 14 species; 59 territorial males or females ($729/\text{km}^2$, 295 per 100 acres). **Remarks:** Apparently the dry and hot conditions did not alter the populations, since the total number of species and total numbers were very similar to 1973. The population was 54 in 1973, 57 in 1969, and 52 in 1972. The Black-headed Grosbeak nested for the first time. Thanks to Paula Crockett. — LOUISE HERING, 568 Marine Street, Boulder, Colo. 80302.

123. SCATTERED MIXED CONIFEROUS FOREST IN SUBALPINE MEADOWS AND SPRUCE BOGS. — **Location:** Oregon; Grant Co., Bates, ¼ mile E of Indian Rock Lookout; 44°45'N, 118°45'W, Desolation Butte Quadrangle, USGS. **Continuity:** Established 1973. **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 ranged from 30°-56°F. It was clear on 7 censuses and cloudy, drizzly or raining on the remaining 3. Rainfall amounted to 1.55 in. during the census period, while the preceding fall, winter and spring precipitation amounts were well above normal. There were numerous deep snow drifts on July 1. **Coverage:** July 1-3, 5-6, 8-10, 13, 15. Heavier than normal snowpack prevented us reaching census area until June 29. The July 15 census showed tapering of territorial behavior for most species as in 1973. All trips between 0435-0800 hours except July 10 between 1705-1900 hours; PDST. Total man-hours: 30. **Census:**

Chipping Sparrow, 20 (62, 25); White-crowned Sparrow, 13 (40, 16); Cassin's Finch, 10 (31, 13); Ruby-crowned Kinglet, 9 (28, 11); Yellow-rumped Warbler, 5 (15, 6); Lincoln's Sparrow, 5; Mountain Bluebird, 3 (9, 4), Mountain Chickadee, 2; Fox Sparrow, 2; Spotted Sandpiper, 1; Com. Flicker, 1; Brewer's Sparrow, 1. **Total:** 12 species; 72 territorial males ($222/\text{km}^2$, 90 per 100 acres). **Remarks:** Four nests were located: Mountain Bluebird, 2; Com. Flicker, 1; White-crowned Sparrow, 1. Owing to the heavy snowpack, nesting of Spotted Sandpipers was delayed but continued rainfall and snow runoff provided ample food supplies for this nesting population. Four chicks approximately 48 hours old were discovered near a running stream on the plot on August 4. We presume some Am. Robins nested on plot but ceased territorial behavior prior to this year's census. Pine Siskins and Clark's Nutcrackers were seen feeding and calling on every census but no positive indication of breeding was observed for either species. Numbers of species were down, with 4 missing and 1 new species. The 4 species absent or non-territorial were Steller's Jay, Am. Robin, Lazuli Bunting and Pine Siskin; the new species was Com. Flicker. Breeding activity was markedly down from last year while 2 species showed populations gains, i.e. Cassin's Finches doubled from 5 to 10 and Ruby-crowned Kinglets were up 2 breeding pairs. Seven species showed losses averaging 4 breeding pairs per species. Species showing the greatest decrease in numbers were, Chipping Sparrows, down 11 pairs; White-crowned Sparrows down 5 pairs; Lincoln's Sparrows down 4 pairs; and Yellow-rumped Warblers down 3 pairs. Declines in populations may be a normal fluctuation owing to weather changes or could be a result from a shorter census period than in 1973. Other vertebrates seen: W. (Boreal) Toad, Pacific Tree Frog, Black Bear, Badger, Coyote, Belding Ground Squirrel, Least Chipmunk, Red Squirrel, N. Pocket Gopher, Porcupine, Rocky Mountain Elk and Mule Deer. 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 SAGE SHRUB — **Location:** California; Los Angeles Co., 2000 yds N of Los Angeles International Airport on hillside overlooking the Marina del Rey small boat harbor, Venice Quadrangle, USGS. **Continuity:** New. **Size:** 21.6 ha = 53.4 acres (Range-finder). **Description of Plot:** There are no trees on the plot, which is split along its entire length by a rarely-used asphalt maintenance road. The dominant vegetation below the road is Castor-Bean (*Ricinus communis*) and Wild Radish (*Raphanus sativus*). Above the road on the NE facing portion White Sage (*Salvia apiana*) and California Sage (*Artemisia californica*) are dominant with a shift to Yellow Mustard (*Brassica campestris*) as the slope curves to face NNW. Ground cover consists primarily of short grasses with Jimson Weed (*Datura meteloides*), Wild Cucumber (*Marah fabaceus*), and various lupines (*Lupinus* sp.) abundant. The loose, sandy soil along with the low precipitation in the area (10-20 inches/year) serves to limit the plant community. **Edge:** Bordered to the east by Lincoln

Bld., a heavily traveled surface street, to the north and south by periodically plowed fields and to the east by a Southern California Gas Co. chain link fence extending the width of the plot. **Topography:** From its hilltop southern boundary, 100 ft. above sea level, the plot drops 95 ft over a horizontal distance of 403 ft to the northern boundary which is at 5 ft above sea level. From its easternmost boundary the hillside plot faces N curving to face NE then curving back to face NNW towards the western boundary. **Weather:** Overcast and warm during most of the study period with two days of light precipitation. **Coverage:** May 12, 19-20, 22; June 4, 6, 8-9. All trips between dawn and 1145 hours except May 20 trip between 1700 and 1930 hours. Total man-hours: 46. **Census:** House Finch, 32 (148, 60); California Quail, 8 (37, 15); Mourning Dove, 7 (32, 13); Cliff Swallow, 6 (28, 11); W. Meadowlark, 5 (23, 9); Brown Towhee, 4 (19, 8); Burrowing Owl, 3 (14, 6); Anna's Hummingbird, 2 (10, 4); Ash-throated Flycatcher, 2; Mockingbird, 2; Loggerhead Shrike, 2. **Total:** 11 species; 73 territorial males ($338/\text{km}^2$, 137/100 acres) **Remarks:** Both the Audubon's Cottontail and Blacktail Jackrabbit are especially abundant and attract numerous dogs and children resulting in much wariness in the bird population. — R. E. SMICE, JR., 8324 Manchester Ave., Playa del Rey, Calif. 90291.

125. COASTAL SCRUB. — **Location:** California, Marin Co., 4 miles NW of Bolinas, 0.5 miles inside the southern boundary of Point Reyes National Seashore, $37^\circ 55' \text{N}$, $122^\circ 45' \text{W}$, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 4 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:** See census 124. **Coverage:** March 31; April 3, 10, 17; May 13, 20, 25; June 8, 15. Trips were variable between 0700 and 1800 hours. Total man-hours: 30. **Census:** White-crowned Sparrow, 13 (161, 65); Wrentit, 9.5 (117, 48); Song Sparrow, 8 (99, 40); Rufous-sided Towhee, 4 (49, 20); Allen's Hummingbird, 2; Bewick's Wren, 2; Orange-crowned Warbler, 1; Scrub Jay, 1; House Finch, +; Am. Goldfinch, +. **Total:** 10 species; 49.5 territorial males ($612/\text{km}^2$, 248 per 100 acres). **Remarks:** There has been a decline in numbers of White-crowned Sparrows since 1972 (37 individuals) 1973 (29) and this year (25). The average minimum age was 1.88 years compared to 2.29 in 1972 and 2.34 in 1973; 44 per cent of the White-crowns this year were one year old. Nests found (9); White-crowned Sparrow (8), Bewick's Wren (1). Contribution No. 92, PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

126. DISTURBED COASTAL SCRUB (A). — **Location:** California; Marin Co.; 3.5 miles NW of Bolinas, just inside the southern boundary of Point Reyes National Seashore; $37^\circ 55' \text{N}$, $122^\circ 45' \text{W}$, Bolinas Quadrangle, USGS. **Continuity:** Established 1972, 3 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 124). **Coverage:** March 4; April 7, 14, 23, 30; May 13, 20-21, 27; June 2, 10, 15. Visits varied between 0800 and 1700 hours. Total man-hours: 26. **Census:** Song Spar-

row, 7 (149, 60); White-crowned Sparrow, 5 (107, 43); Wrentit, 3.5 (75, 30); California Quail, 2; Rufous-sided Towhee, 1; Anna's Hummingbird, 0.5; Scrub Jay, +; Com. Bushtit, +; Bewick's Wren, +; Am. Robin, +; Black-headed Grosbeak, +; Am. Goldfinch, +; House Finch, +. **Total:** 13 species; 19 territorial males ($405/\text{km}^2$, 164 per 100 acres). **Remarks:** The average age of the 9 White-crowned Sparrows was 2.11 years compared to 2.29 in 1973 (66 % were one year old this year). Nests found (5): White-crowned Sparrow (4), Song Sparrow (1). Contribution No. 90, PRBO. — MERYL STEWART, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

127. DISTURBED COASTAL SCRUB (B). — **Location:** California; Marin Co., 3.5 miles NW of Bolinas, and 0.16 miles inside the southern boundary of Point Reyes National Seashore; $37^\circ 55' \text{N}$, $122^\circ 45' \text{W}$, Bolinas Quadrangle, USGS. **Continuity:** Established 1971; 4 consecutive years. **Size:** 5.6 ha = 14 acres (approximately rectangular, 600 x 1000 ft, measured). **Description of Plot:** See AB 25: 1002-1003, 1971. **Weather:** (See Census 124). **Coverage:** April 16; May 1, 21, 28; June 1, 10. Trips were variable between 0800 and 1330 hours. Total man-hours: 20. **Census:** White-crowned Sparrow, 6 (106, 43); Song Sparrow, 4 (71, 29); Am. Goldfinch, 1; Am. Robin, +; Western Bluebird, +; Starling, +. **Total:** 6 species; 12.5 territorial males ($221/\text{km}^2$, 89 per 100 acres). **Remarks:** Nests found: Starling (1), White-crowned Sparrow (1). The average age of the 10 White-crowned Sparrow individuals was 2.2 years (40% were one year old). In the 6 acres bordering the northwest edge there were 2 territorial male Song Sparrows not included in the above census. Contribution No. 91, PRBO. — ROBERT M. STEWART, Point Reyes Bird Observatory, Bolinas, Calif. 94924.

128. DISTURBED FOOTHILL GRASSLAND — **Location:** California; Orange Co., $6\frac{1}{2}$ miles NE of Trabuco Canyon, Audubon Star Ranch Sanctuary; $33^\circ 40' \text{N}$, $117^\circ 30' \text{W}$, Santiago Peak Quadrangle, USGS. **Continuity:** New. **Size:** 10.12 ha = 25 acres (square 1043.5 ft, measured with steel tape). **Description of plot:** Contiguous grassland, with two large cactus patches along two borders; 50% Foxtail (*Fescue* sp.), 20% Brome Grass (*Bromus* sp.), 10% Spear Grass (*Stipa* sp.), 10% Artichoke Thistle (*Cynara* sp.), 5% assorted annuals, 3% Lupine (*Lupinus* sp.), 2% Prickly Pear (*Opuntia* sp.). **Edge:** Bounded on three sides by sage interspersed with California Coast Live Oak and Sycamore trees. Bounded on the N by a large Artichoke patch descending into a riparian canyon. **Topography:** Steep ascending hillside with a few shallow ravines. **Elevation:** 1,400 ft. **Weather:** Cool and usually overcast with fog. **Coverage:** April 17, 19, 26-27, 30; May 1, 4, 10-11, 14, 22, 24-25, 29-31. Hours varied from 0730 to 1100 and totaled 21 man-hours. **Census:** California Quail, 6 (59, 24); W. Meadowlark, 4 (40, 16); Grasshopper Sparrow, 4; Lark Sparrow, 3 (30, 12); Roadrunner, +. **Total:** 5 species; 17 territorial males ($168/\text{km}^2$, 68 per 100 acres). — MICHAEL McCRARY and PETER H. BLOOM, 13611 Hewes Ave., Santa Ana, Calif. 92705.

129. JOSHUA TREE - BLACKBUSH - BLADDER-SAGE ASSOCIATION — **Location:** California; Inyo Co., 15 miles S of the town of Darwin, in Etcheron Valley near Junction Ranch on the China Lake Naval Weapon Center; $36^\circ 04' \text{N}$, $117^\circ 30' \text{W}$, Coso Peak Quadrangle, USGS. **Continuity:** New. **Size:** 16.19 ha = 40 acres (rectangular, 1650 x 1056 ft, measured with steel tape). **Description of Plot:** The Joshua Tree (*Yucca brevifolia*) contributes the only canopy cover to the area. There are an average of 51 Joshua Trees per acre ranging in size from 2 to over 20 ft tall. Nowhere on the plot do these occur in dense stands, the larger plants are spaced from 5 to 50 or more feet apart. The dominant shrubs are Blackbush (*Coleogyne ramosissima*), 46%, Haplopappus sp., 17%; and Bladder-sage (*Salazaria mexicana*), 12%; Other common shrubs are Hop-sage (*Grayia spinosa*), Cheese-bush (*Hymenoclea salsola*), Cotton-thorn (*Tetradymia axillaris*), Box-thorn (*Lycium andersonii* and *L. cooperi*), Beard-tongue (*Penstemon* sp.), and Buckwheat (*Eriogonum* sp.). Silver Cholla (*Opuntia echinocarpa*) is sparsely scattered throughout the plot. The Box-thorn, Cotton-thorn, and Hop-sage grow in dense clumps 4 to 6 ft tall and up to 8 ft across, but contribute less than 6% to the total ground cover. Ground cover is 46%. Average shrub height is between 2 and 3 ft. **Edge:** Bordered on all sides by similar vegetation. **Topography:** A gradual slope; the E boundary is 80 ft higher than the W edge. A few shallow washes run through, E to W. **Elevation:** 5,760 ft. **Weather:** Exceedingly variable; on 5 trips, warm; on the remainder, cool to very cold; on May 19, a blanket of snow covered the ground through the early morning. **Coverage:** April 6-7, 12-14, 20-21, 27; May 11-12, 18-19, 25-26. All trips between dawn and 1100 hours. Total man-hours: 62. **Census:** Black-throated Sparrow, 12 (74, 30); W. Kingbird, 3 (19, 8); Scott's Oriole, 1; House Finch, 1; Ladder-backed Woodpecker, +; Say's Phoebe, +; Mockingbird, +; Loggerhead Shrike, +; Starling, +. **Total:** 9 species; 17 territorial males or females ($105/\text{km}^2$, 43 per 100 acres) **Remarks:** Five nests were located; Black-throated Sparrow, 3; W. Kingbird, 1; House Finch, 1. Special thanks to the personnel of the China Lake Naval Weapon Center and especially Tilly C. Barling whose cooperation and aid made this study possible. — RICHARD L. ZEMBAL, 9715 Richeon Ave., Downey, Calif. 90240.

130. MIXED OAK - DIGGER PINE WOODLAND. — **Location:** California; Butte Co.; a section of Upper Bidwell Park 3.4 mi. NE of Chico, $39^\circ 46' \text{N}$, $121^\circ 47' \text{W}$, Richardson's Spring Quadrangle, USGS. **Size:** 6.9 ha = 17.1 acres. **Continuity:** Established 1972; 2 intermittent years. **Description of Plot:** See AB 26:981-982, 1972. **Weather:** A fairly normal spring following a dry, warm latter half of January. This was expressed by the good show of wildflowers, which bloomed early and was sustained through April by regular showers. Monthly rainfall figures in inches for April, May and June, were 1.62, 0.27 and 0.27, respectively. This compares to a total of 0.84 inches for all three months in 1973. Rainfall data was supplied by the National Weather Service station at the Calif. State Univ., Chico College farm **Coverage:** March 21, 23; April 8, 10-11, 23, 25, 27-28,

May 7, 14, 30. All trips between 0700 and 1100 hours, and all of the night of May 13. Total census-hours: 22.5. **Census:** Plain Titmouse, 9.5 (137, 56); Acorn Woodpecker, 8 (116, 47); Starling, 8; Lesser Goldfinch, 6 (87, 35); Bushtit, 5 (72, 29); Mourning Dove, 2.5; Nuttall's Woodpecker, 2.5; Scrub Jay, 2.5; White-breasted Nuthatch, 2.5; Anna's Hummingbird, 2; Ash-throated Flycatcher, 2; Com. Crow, 2; House Finch, 1.5; Red-shouldered Hawk, +; Screech Owl, +. **Total:** 15 species; 54 territorial males or females ($780/\text{km}^2$, 316 per 100 acres). **Remarks:** Nests of the following were found: Starling, 4; Com. Bushtit, 4; Plain Titmouse, 3; Anna's Hummingbird, 1; Lesser Goldfinch, 1; House Finch, 1. Mary Morrison, Peter Metropulos, Kent Fickett and Jan Fischer provided aid during the census. — TIM MANOLIS, Dept. of Biological Sciences, Purdue University, W. Lafayette, Ind. 47907.

131. SAGEBRUSH STEPPE. — **Location:** Wyoming; Campbell Co., about 6 miles N of Gillette and 0.25 miles S Wyoming Highway 59; $43^\circ 25' \text{N}$, $105^\circ 25' \text{W}$; T51N, R72W; USGS-R73336. **Continuity:** New. **Size:** 8.1 ha = 20.0 acres (rectangle, Brunton-pace survey, gridded at 1-acre intervals). **Description of Plot:** Big Sagebrush (*Artemisia tridentata*) is the dominant shrub with some Silver Sagebrush (*A. cana*). Sagebrush composition is @ 30%. Needle-and-thread Grass (*Stipa comata*) is most abundant (@ 10%) followed by Cheat Grass (*Bromus tectorum*) and W. Wheat Grass (*Agropyron smithii*). Several sedges (*Carex* spp.) and Prairie June Grass (*Koeleria cristata*) are scattered about the plot. Total vegetal ground cover is @ 60%. **Edge:** Bordered by similar vegetation on all sides; established purposefully in one cover type to eliminate edge effect. **Topography:** Mostly flat, intersected by three shallow, dry gulleys. **Elevation:** 4300 ft. **Weather:** Clear to partly cloudy, winds <10 mph, 35°F - 60°F all coverages. **Coverage:** April 1-4, 17-20; May 4-8; June 2-10. All counts between dawn and 0800 hours. Total man-hours: 35. **Census:** Brewer's Sparrow, 5 (62, 25); W. Meadowlark, 4 (49, 20); Lark Bunting, 3 (37, 15); Vesper Sparrow, 3; Horned Lark, 1; Sage Thrasher, 1; Grasshopper Sparrow, 1. **Total:** 7 species; 18 territorial males ($222/\text{km}^2$, 90 per 100 acres). **Remarks:** The sagebrush steppe is a major habitat type in the region. Pronghorn are common ($24/\text{km}^2$, 61/640 acres) in the area. Cattle grazing is light to moderate. This census was conducted as part of an environmental impact study prior to surface coal development. Thanks to Ed Keith and Am. Metal Climax Coal Company. — JEFFREY W. TODD, AMAX Environmental Services Group, 4704 Harlan, Denver, Colo. 80212.

132. DESERT SHRUB. — **Location:** Utah; Washington Co., SW corner of Zion National Park; $37^\circ 10' 30'' \text{N}$, $113^\circ 5' \text{W}$ ($\text{E}\frac{1}{2}$ of $\text{SW}\frac{1}{4}$ & $\text{W}\frac{1}{2}$ of $\text{SE}\frac{1}{4}$, Sec. 34, T41S, R11W, Salt Lake B&M). **Continuity:** New. **Size:** 64.75 ha = 160 acres (880 yards square, stadia surveyed). **Topography:** A series of terraces, low hills and arid drainages typical of the Markagunt Plateau where it slopes southward into the Virgin River Valley, with elevations from 1122 to 1228 meters (3680 to 4030 ft). Coalpits Wash, running southward through the center of the plot, is a shallow valley with an intermittent

stream. The basal formation is the highly-alkaline (above pH 9) Moenkopi, consisting of shales, gypsum and limestone; this is exposed in the NE corner, where it has been dissected into arid gullies and low ridges. In the south half of the plot the Virgin River has covered the Moenkopi with sand, gravel and river boulders. In the NW corner a lava flow has formed a terrace about 300 ft. above the bottom of Coalpits Wash; a cliff, with a talus slope of lava rock below, separates this terrace from the SW corner and from Coalpits Wash. **Description of Plot:** The upper Virgin River Valley, in which the plot is located, is a blending zone for plant and animal life of the Mojave and Great Basin Deserts and the Colorado Plateau. Several plants are at or near the limits of their ranges here. Elevation, soil moisture, soil type and exposure all combine to separate the vegetation into belts or patchwork clumps. The major part of the plot, on the hillsides, terraces, and ridge tops, is covered with Blackbrush (*Coleogyne ramosissima*), Matchbrush (*Gutierrezia sarothrae*), and Big Sagebrush (*Artemisia tridentata*); on the west part of the plot annual and short-season perennial grasses cover the ground between the sparse shrubs. The bottom of Coalpits Wash is a mixed habitat, about 40 acres in size, of desert shrubs and streamside vegetation. The only trees on the hillsides exceeding a 3-inch dbh are Utah and Oneseed Junipers (*Juniperus osteosperma*, *J. monosperma*); their numbers here are negligible. A quantitative survey of the shrubs on the hillsides gave a total of 352 shrub stems/acre; ground cover 62% Shrubs comprising 90% of the total: Blackbrush, Matchbrush, Big Sagebrush, Creosote-bush (*Larrea tridentata*), Desertbeauty Dalea (*Dalea fremontii*), Pale Wolfberry (*Lycium pallidum*) and Silver Cholla (*Opuntia echinocarpa*). Among the grasses identified were: Red Three-awn (*Aristida longiseta*), Ripgut Brome (*Bromus rigidus*), Cheatgrass (*Bromus tectorum*) and Foxtail Barley (*Hordeum jubatum*). On the bottom of Coalpits Wash Fremont Cottonwood (*Populus fremontii*), junipers, Honey Mesquite (*Prosopis juliflora*), Velvet Ash (*Fraxinus velutina*), Sandbar Willow (*Salix exigua*), Tamarix (*Tamarix pentandra*), and Russian-olive (*Elaeagnus angustifolia*) form belts of riparian woodland 20 to 40 ft wide on each side of the stream. An actual count of trees over 3-inch dbh in Coalpits Wash showed 221 trees with a total basal area of 55.0 ft^2 , or an average of $1.375 \text{ ft}^2/\text{acre}$. Junipers accounted for 65% of the trees, Fremont Cottonwoods totaled 12%; the only other trees exceeding 5% were Tamarix (8%) and Honey Mesquite (7%). On each side of the stream bed of Coalpits Wash flash floods periodically scour the vegetation; Emory Baccharis (*Baccharis emoryi*), Sandbar Willows and sapling Cottonwoods grow here. Willows, Baccharis and larger trees form thickets farther back from the stream. Belts and patches of Arrowweed (*Pluchea sericea*), Desertbeauty Dalea, Sand Sagebrush (*Artemisia filifolia*), Fourwing Saltbush (*Atriplex canescens*), Rubber Rabbitbrush (*Chrysothamnus nauseosus*), and Tamarix grow between the trees and the bottoms of the hillsides. A quantitative analysis of the shrubs in the 40 acres of Coalpits Wash gave a density of 65,082 shrub stems/acre; ground cover 53%. The irregular pattern of shrub growth prevented deter-

munication of density by species. **Edge:** The west and east sides are bordered by desert shrub habitats similar to those inside the plot. For a half-mile north of the boundary Coalpits Wash runs as a small perennial stream; in dry years the water sinks back into the ground before it enters the plot. Utah Highway 15 parallels the southern edge and crosses the SW corner. **Weather:** Hot, with above-average temperatures during June and little precipitation during the entire breeding season. **Coverage:** March 18, 26, 29, 31; April 4, 14, 19, 26, 28; May 5, 12, 16, 26; June 9, 16, 20, 26, 29; July 14. On June 9 & 16 two observers each covered half of the plot; 3 observers divided the plot on May 26. All trips were between 0600 and 1230 MDT. Total man-hours: 81. **Census:** Black-throated Sparrow, 17 (26, 11); Rock Wren, 3.5 (5, 2); hummingbirds (Costa's and Black-chinned), 3 (5, 2); Cañon Wren, 3; Mourning Dove, 2; Bewick's Wren, 2; Blue Grosbeak, 2; House Finch, 2; Say's Phoebe, 1.5; Ash-throated Flycatcher, 1; Blue-gray Gnatcatcher, 1; Black-headed Grosbeak, 1; Lesser Goldfinch, 1; W. Meadowlark, 0.5. **Total:** 15 species; 40.5 territorial males or female hummingbirds ($63/\text{km}^2$, 25 per 100 acres). **Remarks:** An unexpected discovery was the lack of bird activity before 0800 when the sun had begun to warm the cool desert air. Most birds, especially Black-throated Sparrows, concentrated their singing between 0800 and 1100. Black-throated Sparrows, hummingbirds and Mourning Doves were the only birds found regularly over the entire plot. Nests of the following species were found: Black-throated Sparrow, 3; Rock Wren, 1; Blue-gray Gnatcatcher, 1; House Finch, 1. Other vertebrates noted: Side-blotted Lizards, Desert Cottontails, Whitetail Antelope Squirrels, Mule Deer, and Coyotes. Special thanks to Tim Hudson for surveying the plot, to Robert Heyder for permission to conduct the census in Zion Nat'l Park, and to Ken Kertell for helping census. — JEROME GIFFORD and PETER SCOTT, *Springdale, Utah 84767.*

133. COTTONWOOD RIVERBOTTOM. — PASTURE. — **Location:** Colorado; Weld Co., about 6 miles S and 1 mile E of Johnstown on the east bank of the St. Vrain Creek and about 1 mile upstream from its confluence with the South Platte River. The area is bordered on the east by Weld Co. road #38, Sect. 3, T3N. R67W. $104^{\circ}52'N$, $40^{\circ}14'W$, Johnstown Quadrangle, USGS. **Continuity:** Established 1973. **Size:** 71.6 ha = 176.9 acres (measured from an aerial photo with a planimeter). **Description of Plot:** See AB 26: 1006-1007, 1973. **Weather:** Mostly clear and warm, abnormally dry. **Coverage:** May 5, 12, 19, 26; June 2, 9, 16, 23, 30; July 7, 15. All trips between dawn and 1000 hours. Total man-hours: 31. **Census:** House Wren, 18 (25, 10); Red-winged Blackbird, 14 (20, 8); W. Meadowlark, 10 (14, 6); Mourning Dove, 9 (13, 5); Starling, 7 (10, 4); Killdeer, 6 (8, 3); Com. Yellowthroat, 5 (7, 3); Com. Flicker, 4 (6, 2); E. Kingbird, 4; Am. Robin, 3 (4, 2); Yellow-headed Blackbird, 3; Am. Kestrel, 2; Bank Swallow, 2; N. Oriole, 2; Mallard, 1; Com. Snipe, 1; Great Horned Owl, 1; Red-headed Woodpecker, 1; Downy Woodpecker, 1; Brown Thrasher, 1; Yellow Warbler, 1; Com. Grackle, 1; Blue Grosbeak, 1; Song Sparrow, 1. **Total:** 24 species; 98 territorial males ($137/\text{km}^2$, 55 per 100 acres). **Remarks:** Nine more breed-

ing species were found in the area in 1974 than in 1973. Eight of these were new species. One 1973 species, Virginia Rail, was not found to be territorial in 1974. Population increases occurred in eight species, decreases occurred in two, and there was no change in five. Mourning Doves, House Wrens, and Red-winged Blackbirds showed the largest population increases. High water levels in the St. Vrain Creek destroyed the nests of the Bank Swallows. A heavy spring rain may have been the cause for the decline in Yellow-headed Blackbird nesting. Both Com. Flicker and Starling populations increased. There is an abundance of dead wood in the Great Plains Cottonwood trees (*Populus sargentii*) with numerous cavities available for nesting. One fledgling Brown-headed Cowbird was observed being fed by a House Wren. — PAUL E. GERTLER and RONALD A. RYDER, *Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins, Colo. 80521.*

134. BALSAM POPLAR BOTTOMLAND —

Location: British Columbia, 1.5 miles ESE of mile 335, Alaska Hwy., on north bank of north channel of Muskwa River; $58^{\circ}49'N$, $123^{\circ}28'W$; map 94J/14W, Raspberry Creek, NTS. **Continuity:** New. **Size:** 13.25 ha = 32.75 acres (irregular, about 550 m N-S by 300 m E-W, taking in the entire peninsula bounded by a bend in the channel; 50 m grid, oriented $N10^{\circ}W$ (true), set up with compass and measured rope). **Description of Plot** Heterogeneous; a series of successional stands, progressively younger from NW to SE, following shifts of the channel. From the northwest, these are: (1) predominantly White Spruce (*Picea glauca*) with few Balsam Poplars (*Populus balsamifera*), on the landward bank of the oldest (dry) channel; (2) mature Balsam Poplars with dense understorey of Mountain Alder (*Alnus tenuifolia*), on the bed and depositing bank of oldest channel; (3) mature Balsam Poplars over younger White Spruces and alders, on landward bank of second channel; (4) middle-aged Balsam Poplars over fewer alders, on bed and depositing bank of second channel; (5) mixed young Balsam Poplars and alders; (6) fairly open gravelly wash, with scattered poplars, alders, and willows (*Salix* spp.); (7) dense thicket of young alders and willows on bank of present channel. Ground cover is dominated by dead leaves except in the open, gravelly areas near the southeast edge; the only important plants under the canopy are horsetails (*Equisetum sylvaticum* and *E. pratense*) and Prickly Rose (*Rosa acicularis*), while lupines (*Lupinus sericeus*) were conspicuous in the more open areas. For a quantitative survey of the vegetation, zones (1) to (3) were combined (I), as were zones (4) to (7) (II), with 13 and 8 circular 1/10-acre samples respectively. The following results were obtained: Trees $1\frac{1}{2}$ inches in diameter and over (3 inches & over in parentheses), (I) 494/acre (279/acre), (II) 824/acre (270/acre); total basal area, (I) $172.7 \text{ ft}^2/\text{acre}$ ($166.7 \text{ ft}^2/\text{acre}$); (II) $89.8 \text{ ft}^2/\text{acre}$ ($74.3 \text{ ft}^2/\text{acre}$). Species comprising 90% of the total number of trees: (I) Balsam Poplar, 126, 26, 69, 92 (126, 45, 72, 92); White Spruce, 90, 18, 23, 77 (78, 28, 23, 77); Alder, 276, 56, 8, 100 (75, 27, 5, 69); (II) Balsam Poplar, 644, 78, 94, 100 (263, 97, 99, 75); Alder, 174, 21, 6, 88 (8, 3, 1, 38). Trees by diameter size class: (I) A ($1\frac{1}{2}$ -3 in.) 215, 43, 6.0, 3, B

(3-6 in.) 105, 21, 11.7, 7 (105, 38, 11.7, 7); C (6-9 in.) 30, 6, 9.2, 5 (30, 11, 9.2, 6); D (9-12 in.) 62, 12, 37.1, 21 (62, 22, 37.1, 22); E (12-15 in.) 50, 10, 49.8, 29 (50, 18, 49.8, 30); F (15-18 in.) 21, 4, 30.9, 18 (21, 7, 30.9, 19); G (18-21 in.) 8, 2, 15.9, 9 (8, 3, 15.9, 10); H (over 21 in.) 4, 1, 12.1, 7 (4, 1, 12.1, 7); (II) A, 554, 67, 15.5, 17; B, 161, 20, 17.9, 20 (161, 60, 17.9, 24); C, 56, 7, 17.4, 19 (56, 21, 17.4, 23); D, 36, 4, 21.7, 24 (36, 13, 21.7, 29); E, 14, 2, 13.6, 15 (14, 5, 13.6, 18); F, 3, trace, 3.7, 4 (3, 1, 3.7, 5). Shrub stems/acre: (I) 705 (920); (II) 1,430 (1,980); ground cover: (I) 48%; (II) 34%; canopy cover: (I) 77% (II) 57%; average canopy height: (I) 72 ft (range 40-110); (II) 35 ft (range 15-65). **Edge:** Bordered by river channel to SW and S, and by dry channel (gravel) to E beyond which is similarly varied successional habitat; to NW and N is bottomland White Spruce forest much as in zone (I). **Topography:** Flat, with two old channels cut about 5 ft below general level. **Elevation:** About 1245 ft. **Weather:** Generally cool, following a snowy winter and a very cool May; survey conditions varied from clear to totally overcast, with generally light winds, and temperatures from 37° to 67°F. **Coverage:** June 3, 9, 13, 18, 22, 25, 27; July 1, (5). All trips between 0352 and 1202 hours PDT, except July 5 until 1725 hours. Total man-hours: 17½ plus 7½ hr. on combined plant and bird survey July 5, and about 7 hr. while measuring and marking the grid on May 25-26. **Census:** Ovenbird, 4 (30, 12); Swainson's Thrush, 3 (23, 9); Warbling Vireo, 3, Yellow-rumped Warbler, 2.5; *Empidonax* flycatcher (probably Yellow-bellied), 2; Magnolia Warbler, 2; Least Flycatcher, 1.5; Red-eyed Vireo, 1.5; Am. Redstart, 1.5; Am. Robin, 1; Black-and-white Warbler, 1; W. Tanager, 1; Rose-breasted Grosbeak, 1; Dark-eyed Junco, 1; Yellow-bellied Sapsucker, 0.5; Traill's (Alder) Flycatcher, 0.5; Tennessee Warbler, 0.5; Chipping Sparrow, 0.5; Canada Goose, +; Ruffed Grouse, +; Varied Thrush, +; Bay-breasted Warbler, +; White-throated Sparrow, +; Lincoln's Sparrow, +. **Total:** 24 species; 28+ territorial and non-territorial males (211+/km², 86+ per 100 acres). **Remarks:** This plot is strikingly heterogeneous, despite the dominance of Balsam Poplar throughout, and the diversity of breeding birds results from the varied habitats offered. The Chestnut-sided Warbler, at least 300 miles beyond its known range, was seen as it sang in the willows by the channel on June 18. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

135. MATURE ASPEN STAND. — **Location:** British Columbia, on north side of Alaska Hwy just E of mile 320, on south slope of Poplar Hills; 58°50'N, 123°12'W; map 94J/14E, Raspberry Creek, NTS. **Continuity:** New. **Size:** 19.25 ha = 47.6 acres (rectangular, 550 m by 350 m; 50 m grid, oriented N3°E (true), set up with compass and measured rope). **Description of Plot:** A stand of mature Quaking Aspen (*Populus tremuloides*) with a few scattered mature White Spruces (*Picea glauca*). There are few small trees, but Mountain Alder (*Alnus tenuifolia*), Mooseberry (*Viburnum edule*), and Prickly Rose (*Rosa acicularis*), with lesser amounts of Soapberry (*Shepherdia canadensis*) and Red-Osier Dogwood (*Cornus stolonifera*), provide a dense and tangled shrub layer. Ground cover is dominated by dead leaves and fallen logs, with Bunchberry (*Cornus*

canadensis), Dewberry (*Rubus pubescens*), and White Violet (*Viola renifolia*) the most frequent plants. A quantitative survey of the vegetation, based on 17 circular 1/10-acre samples, gave the following: Trees 3 inches diameter and over, 302/acre; total basal area, 146.3 ft²/acre. Species comprising 90% of the total number of trees: Trembling Aspen, 284, 94, 94, 100. Trees by diameter size class: A (3-6 in.) 46, 15, 5.1, 3, B (6-9 in.) 113, 38, 34.9, 24; C (9-12 in.) 103, 34, 61.9, 42, D (12-15 in.) 32, 11, 32.2, 22; E (15-18 in.) 6, 2, 9.5, 7, F (18-21 in.) 1, trace, 2.5, 2. Shrub stems/acre: 1,385, ground cover 67%; canopy cover 75%; average canopy height 82 feet (range 70-90). **Edge:** Bordered by similar forest on all sides. The highway right-of-way, about 30 yards wide, runs roughly parallel and about 70 yards south of the plot. A cleared seismic line (for oil exploration) about 40 ft wide marks the west edge; beyond this the forest resumes, but is broken by logging about 100 yards farther west. A younger aspen stand, with trees 30-40 ft tall, extends in a northeasterly direction from near the southeast corner. **Topography:** The top and both sides of a low ridge, extending farther down to the south, with the steepest slope near the southwest corner. **Elevation:** About 1500-1650 ft. **Weather:** Generally cool, following a snowy winter and a very cool May; most surveys had at least partly sunny skies, but the woods were very wet from rain during the preceding night on 5 of 8 surveys; winds were force 3-4 (Beaufort), causing leaves to rustle noisily, on two surveys; temperatures during counts ranged between 36° (June 5) and 70°F (June 21 & 28). **Coverage:** June 5, 7, 11, 18, 21, 24, 28; July (3, 6), 6. All trips between 0351 and 1104 hours PDT, except July 3 to 1600 hours. Total man-hours: 23½, plus 6¾ on combined plant and bird survey July 3 and 6, and about 10½ hr. while measuring and marking the grid on May 16-17. **Census:** Ovenbird, 11.5 (60, 24); Magnolia Warbler, 5.5 (29, 12); Yellow-bellied Sapsucker, 3 (16, 6); Swainson's Thrush, 3; Red-eyed Vireo, 2; Least Flycatcher, 1.5; Canada Warbler, 1.5, Tennessee Warbler, 1; Com. Flicker, 0.5; Am. Robin, 0.5; Pileated Woodpecker, +; Mourning Warbler, +; Rose-breasted Grosbeak, +. **Total:** 13 species; 30 territorial males (156 per km²; 63 per 100 acres). Three active nests (with noisy young) of sapsuckers were found. This is at least 300 miles NW of the previously known range of the Canada Warbler. In this region, aspen forms pure stands only at low elevations and on southern exposures; the Fort Nelson lowlands (elevation 1300-1700 ft) have the most northwesterly aspen forests of any great extent, so the occurrence there of species characteristic of this habitat, although well beyond their range, is not really surprising. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3*

136. WILLOW-ALLUVIAL DEPOSIT. — **Location:** British Columbia, on the Peace River, 6.5 miles S and 5.5 miles W of Clayhurst; 56°06'N, 120°11'W, Charlie Lake, 94A. **Continuity:** New. **Size:** 15.2 ha = 37.5 acres (a rectangle with area removed on NW and SE corners, greatest dimensions 800 m N-S by 200 m E-W; 50 m grid laid out with compass and pacing). **Description of Plot:** A sand and gravel bar at the east end of Raspberry Island; 10 ha of the plot is covered with shrubs, two

areas at north and south ends, total area of 4 ha, are densely covered with willow (*Salix* sp.) shrubs (11/m² based on 7 square-meter samples). The rest of this area has a few Balsam Poplar (*Populus balsamifera*) shrubs and willows bent and twisted by ice and snow during much of the winter and spring. The ground cover is composed of sweet clover (*Melilotus* sp.), Reed Grass (*Calamagrostis inexpansa*), 6, and Horsetail (*Equisetum* sp.), 5, in order of frequency, based on 23 square-meter samples in each of the 1/10 acre circles. Base sand and gravel make up 5 ha of the plot with only minute willow growing in the areas of shifting sands. A quantitative survey of the vegetation gave the following results: All 13 Balsam Poplar trees were size class A (3-6 in.), 0.3/acre; total basal area 1.3 ft.²/acre. All willow shrubs were less than 1½ in. dbh with an estimated height range of 7-10 ft. Based on twenty-three 1/10 acre circular samples: shrub stems/acre 126, 304; ground cover 46%; canopy cover 10%, average canopy height 31 ft. (range 27-35). **Edge:** Bordered on all sides by water. **Topography:** Essentially flat but rising slightly to form two mounds at each end covered with willow thickets. Maximum height above the river, 15 ft. **Elevation:** 1250 ft. **Weather:** Seasonable temperatures throughout census period. **Coverage:** June 3 (2), 4-6, 18-20. All trips between 0425 and 0625, PST, plus one trip on June 3, 1910-2012 hours. Total man-hours: 9. **Census:** Song Sparrow, 16 (105, 43); Spotted Sandpiper, 3 (20, 8); Yellow Warbler, 2; Lincoln's Sparrow, 1; Com. Nighthawk, +; E. Phoebe, +; Red-winged Blackbird, +; Brewer's Blackbird, +; Chipping Sparrow, +. **Total:** 9 species; 22 territorial males (145/km², 59 per 100 acres). **Remarks:** Three Spotted Sandpiper nests were located: 2 with 4 eggs each and 1 with 3 eggs. Mammals noted: Beaver; Deer Mouse; Meadow Vole; Coyote. Funding was provided by British Columbia Hydro and Power Authority, Vancouver, B.C. Thanks to C. Fischer for helping lay out the plot and providing mammal data. — LORAN L. GOULDEN, *Renewable Resources Consulting Services Ltd.*, 11440 Kingsway Ave., Edmonton, Alberta, Canada, T5G 0X4.

137. BLACK SPRUCE STAND ON MOUNTAIN-SIDE. — **Location:** British Columbia, on S side of Alaska Hwy just W of mile 346, on N slope of Steamboat Mtn.; 58°43'N, 123°39'W; map 94J/12E, Chischa River, NTS. **Continuity:** New. **Size:** 17.25 ha = 42.6 acres (rectangular, 550 by 350 m with a 200 by 100 m rectangle omitted at the S corner; 50 m grid oriented N45°E (true), set up with compass and measured rope). **Description of Plot:** A mature coniferous stand on a steep slope traversed by several gullies, one of which carried water throughout the study. The gullies are densely grown with Mountain Alder (*Alnus tenuifolia*) and Devil's Club (*Oplopanax horridus*), as are several small open patches elsewhere on the steeper slopes. An extensive area of scrubby Paper Birch (*Betula papyrifera*), Beaked Willow (*Salix bebbiana*), and alder stretches S from the S end of the plot. The canopy is largely of Black Spruce (*Picea mariana*). A few large trees of White Spruce (*P. glauca*), Lodgepole Pine (*Pinus contorta*), and Quaking Aspen (*Populus tremuloides*) are probably survivors from an earlier stage of forest succession. There is little understorey

except in the alder-filled openings, and most young conifer growth is of Subalpine Fir (*Abies lasiocarpa*) rather than spruce. Other important shrubs include Prickly Rose (*Rose acicularis*) and Wild Raspberry (*Rubus idaeus*). Ground cover varies greatly, with mosses (*Hylocomium splendens*, *Hypnum cristatum*, *Pleurozium schreberi*), Bunchberry (*Cornus canadensis*), Twinflower (*Linnaea borealis*), Dewberry (*Rubus pubescens*), and Mountain Cranberry (*Vaccinium vitis-idaea*) the most frequent plants. Dead leaves, sticks, and logs were also common. A quantitative survey of the vegetation, based on 22 circular 1/10-acre samples, gave the following: Trees 3 inches diameter and over, 458/acre; total basal area 136.2 ft²/acre. Species comprising 90% of the total number of trees: Black Spruce, 346, 75, 65, 100; Paper Birch, 40, 9, 10, 55; White Spruce, 25, 5, 10, 55, Lodgepole Pine, 24, 5, 9, 55. Trees by diameter size class: A (3-6 in.) 234, 51, 26.0, 19; B (6-9 in.) 124, 27, 38.1, 28; C (9-12 in.) 81, 18, 48.7, 36; D (12-15 in.) 17, 4, 16.8, 12; E (15 in. & over) 4, trace, 6.6, 5. Shrub stems/acre: 1,128; ground cover 80%; canopy cover 57%; average canopy height 64 ft (range 30-85). **Edge:** Bordered by similar forest, except to the south, where birch-willow-alder scrub extends out of sight upslope. The highway right-of-way parallels the NW edge, approaching but not entering it near the W corner. **Topography:** Rising steeply to the SE; the slope is more gentle for the first 100 m, then very steep (ca. 35° in places), and levelling out somewhat on top of a spur near the S corner; the stream gully is also steep-sided. **Elevation:** About 2100-2450 ft. **Weather:** See Census 133. **Coverage:** June 4, 9, 12, 20, 23, 26, 29; (July 6-7) All trips between 0405 and 1240 hours PDT, except July 6-7 until 1515 and 1605 hours. Total man-hours: 21, plus 9½ hr on combined plant and bird survey July 6-7, and about 16 hr. while measuring and marking the grid on May 20-21. **Census:** Swainson's Thrush, 5 (29, 12), Yellow-rumped Warbler, 4.5 (26, 11); Chipping Sparrow, 3 (17, 7); Golden-crowned Kinglet, 2.5; Tennessee Warbler, 2; Ruby-crowned Kinglet, 1.5; Yellow-bellied Sapsucker, 1; Varied Thrush, 1; Dark-eyed Junco, 1, Boreal Chickadee, 0.5; Ruffed Grouse, +; N. Three-toed Woodpecker, +. **Total:** 12 species; 22 territorial males (128/km², 52 per 100 acres). **Remarks:** Like other plots surveyed in this region in 1974, this shows a very low breeding bird density, which may be characteristic of such northern areas. Red squirrels were noted on 4 surveys, and their middens were seen in several places — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3*.

138. BOTTOMLAND WHITE SPRUCE FOREST — **Location:** British Columbia, on south side of Alaska Hwy, near mile 336, about ¾ mile west of Kledo Creek campsite; 58°49'N, 123°31'W; map 94J/13E, Kledo Creek, NTS. **Continuity:** New. **Size:** 19.25 ha = 47.6 acres (rectangular; 550 m by 350 m; 50 m grid, oriented N50°E, set up with compass and measured rope). **Description of Plot:** An even-aged stand of White Spruce (*Picea glauca*), with smaller amounts of Black Spruce (*P. mariana*), and Quaking Aspen (*Populus tremuloides*). There is little understorey except smaller individuals of the canopy species, most of them dead

Shrubs are predominantly Mooseberry (*Viburnum edule*) and Prickly Rose (*Rosa acicularis*). The ground cover includes mosses (mainly *Hylocomium splendens*, *Pleurozium schreberi*, and *Hypnum crista-castrensis*, in that order), Wood Horsetail (*Equisetum sylvaticum*), False Mitrewort (*Mitella nuda*), Dewberry (*Rubus pubescens*), Bunchberry (*Cornus canadensis*), and Twinflower (*Linnaea borealis*), with dead leaves and sticks. A quantitative survey of the vegetation gave the following, based on 20 circular 1/10-acre samples: Tees 3 inches in diameter and over, 603/acre; total basal area 195.4 ft²/acre. Species comprising 90% of the total number of trees: White Spruce, 473, 78, 78, 100; Quaking Aspen, 57, 9, 12, 60; Black Spruce, 37, 6, 4, 60. Trees by diameter size class: A (3-6 in.) 272, 45, 30.1, 15; B (6-9 in.) 192, 32, 59.2, 30; C (9-12 in.) 93, 15, 56.2, 29; D (12-15 in.) 37, 6, 36.3, 19; E (15-18 in.) 8, 1, 11.1, 6; F (18-22 in.) 1, trace, 2.3, 1. Shrub stems/acre: about 255; ground cover 84%; canopy cover 59%; average canopy height 80 ft (range 65-100). **Edge:** Bordered by similar forest on all sides; the highway parallels the northwest side about 70 meters away. **Topography:** Flat, on floodplain between Kledo and Steamboat Creeks (tributaries of Muskwa River). **Elevation:** About 1260 ft. **Weather:** Generally cool, following a snowy winter and a very cool May; most surveys were on cloudy to overcast days, with light winds, and temperatures from 30° (12 June) to 63° (29 June). **Coverage:** June 4, 10, 12, 17, 22, 27, 29; July 7, plus combined plant & bird survey July 1. All trips between 0345 and 1100 hours PDT, except July 1 to 1645 hours. Total hours: 20½, plus 8½ on July 1, and about 9 hours while measuring and marking the plot on May 18-19. **Census:** Ruby-crowned Kinglet, 3 (16, 6); Yellow-rumped Warbler, 3; Bay-breasted Warbler, 3; Chipping Sparrow, 3; Ovenbird, 2.5; Swainson's Thrush, 2; Golden-crowned Kinglet, 2; N. Three-toed Woodpecker, 1; Boreal Chickadee, 1; Ruffed Grouse, +. **Total:** 10 species; 20.5 territorial males (106/km², 43 per 100 acres). **Remarks:** The most notable thing was the low density of birds encountered, which was general throughout this region in 1974 although less obvious in edge situations such as roadsides. On this plot, one often walked 300-500 meters without hearing a bird. This was especially true in late June, when Ruby-crowned Kinglets were generally silent everywhere, although quite common before and after this period. The regular species were all generally distributed, which in any case was quite uniform so that few distinctive features could be distinguished. Red squirrels were noted on only two surveys, and no obvious middens were detected. — ANTHONY J. ER-SKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

139. STUNTED BLACK SPRUCE ON RAISED BOG. — **Location:** British Columbia, on NW side of Alaska Hwy near mile 339, about one mile north of bridge over Steamboat Creek; 58°48'N, 123°34'W; map 94J/13E, Kledo Creek, NTS. **Continuity:** New. **Size:** 35 ha = 86.5 acres (rectangular; 700 m by 500 m; 100 m grid, oriented N 0° (true), set up with compass and measured rope). **Description of Plot:** Part of an extensive raised bog occupying the plain between the valleys of Steamboat and Kledo Creeks, which are 50 to 100 ft

below the level of the bog surface. Permafrost was present at a depth of 8 to 10 inches below the surface at the end of June. The bog is largely composed of *Sphagnum* moss, mostly consolidated into dry hummocks covered with Labrador-Tea (*Ledum groenlandicum*), with clumps of Black Spruce (*Picea mariana*). Other important elements in the ground cover were lichens (*Cladonia* spp.), Mountain Cranberry (*Vaccinium vitis-idaea*), and Cloudberry (*Rubus chamaemorus*). Dwarf Birch (*Betula glandulosa*) and at least 3 spp. of willows (*Salix*) were also widely distributed. About 5% of Tamarack (*Larix laricina*) and a few scattered Lodgepole Pine (*Pinus contorta*) and Paper Birches (*Betula papyrifera*) were the only other trees. The largest spruces attained about 5 inches dbh by 30 ft tall, mainly near the south and east edges; much of the western part was open, with only a few trees more than 10 ft tall. Of 18 circular 1/10 acre samples, only 3 had as much as 10% of the area occupied by vegetation more than 4 ft high. Estimated shrub stems/acre, 390. **Edge:** Bordered by similar bog forest on all sides, rather more open to the west, denser to NE and SW, and with more broad-leaved trees mixed in to the SE (towards the edges of the creek valley). A hydro line right-of-way passes about 60 m from the SE corner, and the highway another 50 m beyond that. **Topography:** Flat. **Elevation:** 1400 ft. **Weather:** See Census 133. **Coverage:** June 3, 10, 13, 17, 20, 23, 26, (30); July 5. All trips between 0354 hours and 1053 hours, except June 30 to 1400 hours. Total man-hours 18½, plus about 5½ during combined plant and bird survey on June 30, and nearly 8 hours while measuring and marking the plot on May 22. **Census:** Palm Warbler, 5 (14, 6); Dark-eyed Junco, 2; Chipping Sparrow, 2, Hermit Thrush, 1.5; Lincoln's Sparrow, 1; Canada Jay, 0.5; Spruce Grouse, +. **Total:** 7 species; 12 territorial and non-territorial males (34 per km², 14 per 100 acres) **Remarks:** The density, as usual in these boreal bogs, is very low. Most territories were quite diffuse, and the estimated numbers of the 3 fringillid species are probably too low. The jays moved freely, but were detected on nearly every survey, so are included as breeding (begging young were present). One Chipping Sparrow nest was found. — ANTHONY J. ER-SKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Canada K1A 0H3.*

140. UPLAND LICHEN WOODLAND. — **Location:** Northwest Territories, near Porter Lake; 61°42'N, 108°00'W; Map 75G McCann Lake. **Continuity:** New. **Size:** 20.25 ha = 50.04 acres (a square 450 by 450 m, paced using compass). **Description of Plot:** A mature stand of Black Spruce (*Picea mariana*), White Spruce (*P. glauca*), scattered Jack Pine (*Pinus banksiana*) and Paper Birch (*Betula papyrifera*). No understory was present and ground cover consisted mainly of *Cladonia amaurocraea*, *C. mitis*, *Stereocaulon paschale*, *Cetraria islandica*, *C. laevigatum*, and *C. nivalis*. Small clones of Black Spruce were scattered throughout the plot. The ground cover within these clones consisted mainly of the moss *Pleurozium schreberi* and the liverwort *Ptilidium ciliare*. Very few fallen trees were present. Four samples for tree heights, diameters, and distance between trees were carried out. Each sample was of 50 trees. Average tree diameter was 5 cm (2 inches)



Census 140. Aerial view showing scattering of Paper Birch among spruce-pine forest.

with a maximum of 28 cm (11 inches) and a minimum of 0.5 cm (.2 inches). Average tree height was 4.3 m (14.1 ft). The average distance between trees was 1.5 m (4.9 ft). This distance was lessened by the Black Spruce clones. **Edge:** Bordered by similar habitat except in the NE corner where a Black Spruce bog was situated about 15 m from boundary. **Topography:** Generally flat with several gently rolling hills; bisected by an E-W running esker which rises 15.2 m (50 ft) above the level of the rest of the plot. **Elevation:** 396 m (1300 ft). **Weather:** Temperatures about average with highs ranging from 65° to 70°F. Precipitation was above normal and light rain was encountered on 2 of the census trips. **Coverage:** June 6-12; June 14, 17-18, 24, 27, 29. Seven trips between 0400 and 1100 hours, CST, 4 trips between 1900 and 2300 hours and 2 trips between 1300 and 1500 hours. Total man-hours: 48.9. **Census:** Yellow-rumped Warbler, 9.5 (47, 19); Swainson's Thrush, 6 (30, 12); Dark-eyed Junco, 5 (25, 10); Am. Robin, 4.5 (22, 9); Gray-cheeked Thrush, 3 (15, 6); Com. Flicker, 2; Ruby-crowned Kinglet, 2; White-crowned Sparrow, 2; Spruce Grouse, 1; N. Three-toed Woodpecker, 1; Tree Swallow, 1; Gray Jay, 1; Blackpoll Warbler, 1; Rusty Blackbird, 1; Fox Sparrow, 1; Pine Grosbeak, 0.5; Harris' Sparrow, 0.5; Black-backed Three-toed Woodpecker, +; Com. Raven, +; Boreal Chickadee, +; White-throated Sparrow, +. **Total:** 21 species; 42 territorial males ($207/\text{km}^2$, 84 per 100 acres). **Remarks:** Single nests were found for the N. Three-toed Woodpecker, Com. Flicker, Tree Swallow, Robin and Swainson's Thrush. A family group of 4 young and 2 adult Gray Jays were seen on all visits. As daylight was almost continuous, different hours of visits were used through the period. Ruby-crowned Kinglets seldom sang prior to 0700 hours (although sunrise was approximately 0200 hours). With the exception of the kinglet and Swainson's and Gray-cheeked Thrush the best census time was between 0400 and 0700. The thrushes were most vocal between 2200 and 2300 hours. — WAYNE C. HARRIS (compiler), EDWARD A. JOHNSON, SUSAN J.B. JOHNSON, KEN M. TRAYNOR, Department of Plant Ecology, Institute for Northern Studies, University of Saskatchewan, Saskatoon, Sask. S7N OWO. Canada.

141. ABANDONED TRACT. — **Location:** British Columbia, on the Peace River, 6½ mi. S and 4½ mi. W of Clayhurst; 56°06'N, 120°08'W, Charlie Lake, 94A. **Continuity:** New. **Size:** 14.7 ha = 36.25 acres (a square with area in NE and SE corners removed, greatest dimensions 450 m; 50 m grid laid out with compass and pacing). **Description of Plot:** An abandoned tract of land cleared in 1968-69; idle since 1971. Mature Balsam Poplar (*Populus balsamifera*) is the dominant canopy tree mainly confined to two ravines that run EW through the plot; 6.5 ha is open field. Dense thickets of Red-osier Dogwood (*Cornus stolonifera*) interspersed with open grassy areas make up the rest of the area. Large partially burned dead trees stand or lie on the ground in the southern portion. The dominant shrubs are dogwood, 12; Prickly Rose (*Rosa acicularis*), 9; and willow (*Salix* sp.), 4; in order of frequency, based on 23 square meter samples in each of the 1/10 acre circles. The primary ground cover consists of graminoids and horsetail (*Equisetum* sp.). A quantitative survey of the vegetation gave the following results: All trees 3-inches diameter and over were counted and dbh measured, 7/acre; total basal area $10.7 \text{ ft.}^2/\text{acre}$. Species comprising 100% of the total number of trees: Balsam Poplar, 4, 50, 51, —; willow 2, 21, 2, —; White Spruce (*Picea glauca*), 0.2, 2, 5, —. Trees by diameter size class: A (3-6 in.) 2, 29, 0.2, 2; B (6-9 in.) 1, 19, 0.4, 3; C (9-15 in.) 1, 16, 0.9, 7; D (15-21 in.) 1, 15, 2.0, 16; E (21-27 in.) 1, 9, 2.0, 16; F (27-33 in.) 0.4, 5, 2.0, 16; G (33-40 in.) 0.2, 3, 1, 8, 14; H (>40) 0.2, 4, 3.4, 26. Based on twenty-three 1/10 acre circular samples: shrub stems/acre: 93,543; ground cover 67%; canopy cover 10%; canopy height ranged from 35 to 100 ft. **Edge:** Bordered on W, S and E sides by more mature habitat, on the N by the river bank. **Topography:** Mostly flat except for two ravines. **Elevation:** 1300 ft. (about 30 ft above the river). **Weather:** Seasonable temperatures throughout census period. **Coverage:** June 2-6, 18-20. All trips between 0253 and 0500, PST. Total man-hours: 12. **Census:** Clay-colored Sparrow, 30 (204, 83); White-throated Sparrow, 9 (61, 25); Lincoln's Sparrow, 9; Chipping Sparrow, 4 (27, 11); E. Phoebe, 3 (20, 8); Song Sparrow, 3; Am. Kestrel, 1; Com. Flicker, 1; Gray Jay, 1; Am. Robin, 1; Swainson's Thrush, 1; Red-eyed Vireo, 1; Yellow Warbler, 1; Mourning Warbler, 1; Am. Redstart, 1; Brewer's Blackbird, 1; W. Tanager, 1; Dark-eyed Junco, 1; Yellow-bellied Sapsucker, +; Hairy Woodpecker, +; E. Kingbird, +; Warbling Vireo, +; Com. Yellowthroat, +; N. Oriole, +; Savannah Sparrow, +. **Total:** 25 species; 70 territorial males or family groups ($477/\text{km}^2$, 193 per 100 acres). **Remarks:** Three nests were located: Clay-colored Sparrow, 2; Am. Kestrel, 1. Other vertebrates noted: Garter Snake, Deer Mouse, Gapper's Red-backed Mouse, Meadow Vole, Meadow Jumping Mouse, Black Bear, and Moose. Funding was provided by British Columbia Hydro and Power Authority, Vancouver, B.C. Thanks to C. Fischer for helping lay out the plot and providing mammal data. — LORAN L. GOULDEN, Renewable Resources Consulting Services Ltd., 11440 Kingsway Ave., Edmonton, Alberta, Canada, T5G 0X4.

142. MATURE POPLAR — SPRUCE ISLAND. —

Location: British Columbia, on the Peace River, 5.5 miles W and 1.5 miles S of Fort St. John; 56°13'N, 120°58'W, Charlie Lake, 94A. **Continuity:** New. **Size:** 19.25 ha = 47.6 acres (a rectangle with area in NE and SW corners removed, greatest dimensions 1000 m E-W by 300 m N-S; 50 m grid laid out with compass and measured wire cable). **Description of Plot:** An alluvial deposited island in the Peace River with Balsam Poplar (*Populus balsamifera*) and White Spruce (*Picea glauca*) the dominant canopy trees. Most prominent in the understory are Red-Osier Dogwood (*Cornus stolonifera*) and Prickly Rose (*Rosa acicularis*). The green ground cover is primarily horsetail (*Equisetum* sp.) and Bunchberry (*Cornus canadensis*). Dead leaves and spruce needles cover the ground in many places. About 5 ha are covered with dense mature spruce forest. Mature poplar dominate about 10 ha including the W and central parts of the island with a mixture of younger, denser trees near the W end. Two piles of driftwood cover about 0.5 ha on the northern edge. Soil is sandy. A quantitative survey of the vegetation gave the following results: Trees 3 inches diameter and over, based on thirty circular 1/10 acre samples, 238/acre; total basal area 190.4 ft.²/acre. Species comprising 90% of the total number of trees: White Spruce, 96, 40, 32, 73; Balsam Poplar, 87, 37, 58, 90; Green Alder (*Alnus crispa*), 31, 13, 2, 53; dead trees, 23, 9, 7, 77; Paper Birch (*Betula papyrifera*), 1, 1, 0.1, 1. Trees by diameter size class: A (3-6 in.) 82, 35, 8.2, 4; B (6-9 in.) 33, 14, 9.9, 5; C (9-15 in.) 67, 28, 53.4, 28; D (14-21 in.) 44, 19, 79.6, 42; E (21-27 in.) 9, 4, 26.0, 14; F (27-33 in.) 2, 1, 10.7, 6; G (33-40 in.) 0.4, 0.2, 2.6, 1. Shrub stems/acre: 73,050; ground cover 58%; canopy cover 45%; average canopy height 77 ft. (range 35 - 108). **Edge:** Bordered on all sides by water. **Topography:** Mostly flat except for a ravine near the western end that reaches a maximum depth of 15 ft. **Elevation:** 1400 ft. **Weather:** Cool and stormy becoming seasonable. Snow covered the ground in the ravine May 30-31. **Coverage:** May 30-31; June 8, 10-14. All trips between 0255 and 0627 hours, PST. Total man-hours: 23. **Census:** Red-eyed Vireo, 6 (31, 13); Chipping Sparrow, 6; Am. Redstart, 5 (26, 11); Swainson's Thrush, 4 (21, 8); Dark-eyed Junco, 4; Yellow-rumped Warbler, 3 (16, 6); Black-throated Green Warbler, 3; W. Tanager, 3; Ruffed Grouse, 2; Am. Robin, 2; Golden-crowned Kinglet, 2; Yellow Warbler, 2; Magnolia Warbler, 2; Brown-headed Cowbird, 2 (females); Song Sparrow, 2; Am. Kestrel, 1; Com. Flicker, 1; Yellow-bellied Sapsucker, 1; N. Three-toed Woodpecker, 1; Least Flycatcher, 1; W. Wood Pewee, 1; Gray Jay, 1; Black-capped Chickadee, 1; Ovenbird, 1; Rose-breasted Grosbeak, 1; Hairy Woodpecker, +; E. Kingbird, +; Black-billed Magpie, +; Ruby-crowned Kinglet, +; Starling, +; Tennessee Warbler, +; N. Oriole, +; Pine Siskin, +; White-throated Sparrow, +. **Total:** 34 species; 58 territorial males, females or family groups (301/km², 122 per 100 acres). **Remarks:** Five nests were located: Dark-eyed Junco, 2; Green-winged Teal, 1; Com. Goldeneye, 1; Spotted Sandpiper, 1; Ruffed Grouse, 1 (brood). Other vertebrates noted: Boreal Toad; Red Squirrel; Deer Mouse; Gapper's Red-backed Mouse; Meadow Vole; Meadow Jumping Mouse; Coyote; Black Bear; Mule Deer; Moose. There was some difficulty separating the

songs of Chipping Sparrows and juncos but the relative numbers of each are probably correct. Funding was provided by British Columbia Hydro and Power Authority, Vancouver, B.C. Thanks to C. Fischer for helping lay out the plot and providing mammal data — LORAN L. GOULDEN, *Renewable Resources Consulting Services Ltd.*, 11440 Kingsway Ave., Edmonton, Alberta, Canada, T5G 0X4.

143. SALICORNIA SALT MARSH. — Location

California; Orange Co., Bolsa Chica Ecological Reserve, 4 miles NW of Huntington Beach adjacent to Pacific Coast Highway. **Continuity:** New. **Size:** 2.7 ha = 6.7 acres (2 contiguous rectangles, 256 x 1024 ft and 150 x 256 ft, measured with premeasured cord). The plot was located between the highway and the water channels and avoided large areas of mud flats. **Description of Plot:** Except for areas adjacent to the highway, the habitat is covered with low lying vegetation, usually less than one ft in height and frequently with an inch or two of brackish water standing on the surface. Along the side of the plot adjoining the highway there were taller bushes such as *Juncus acutus* var. *sphaerocarpus*, and *Pluchea purpurascens*, averaging about three ft in height. A breakdown of the estimated plant cover is as follows: Cord Grass, *Spartina foliosa* lightly spaced, 35%; *Salicornia subterminalis* and *virginianus*, 30%; *Salicornia* and Salt Grass (*Distichlis spicata*), 10%; bare ground, 10%; *Pluchea purpurascens*, 5%, *Frankenia grandifolia* 5%; miscellaneous plants including Brass Buttons (*Cotula coronopifolia*) and *Juncus acutus* 5%. The plot included an area of about 1/4 acre (90 x 185 ft) that has been filled in to a height of about 4 ft above the marsh level. It had a hard graded surface and sparse vegetation. **Edge:** Pacific Coast Highway (heavily traveled) parallels the plot at about 50 ft to the SW followed by the ocean some 600 ft away across a sandy beach (Bolsa Chica State Beach). A 20 ft channel runs more or less parallel across the north east edge. Across the channel is more marsh with scattered oil wells. The marsh continues SE along the highway for about 1/2 mile then blends into a large oil field. To the NW the channel joins a much larger channel which constricts the land between the highway and the channel to only about 50 ft in width. This larger channel continues NW for about 1/4 mile to a series of tidal gates. **Topography:** Essentially flat. The NW portion of the plot is 3 or 4 ft above the water level of the channel with firm ground and no standing water. The SE portion is at or only slightly above the water level leaving an inch or two of water standing on the surface of a large per cent of the plot. **Elevation:** Sea level. **Weather:** Mild with very little precipitation. Mornings usually overcast. **Coverage:** April 13-14, 17, 24, 28; May 3, 10, 18, 24, 26, 27. All between 0515 and 0730. Total man-hours, 14. **Census:** Black-necked Stilt, 8 (295, 119); Savannah Sparrow 7, (258, 104); W. Meadowlark, 2; Killdeer, +. **Total:** 4 species; 17 territorial males (627/km², 254 per 100 acres). The stilt count does not approximate the population of the marsh in general, because the plot contained a breeding colony. Five stilt nests were discovered. Six Savannah Sparrow nests were found — JOSEPH F. ALEXANDER, 26455 Western Ave. Highland, Calif. 92346.

144. SHRUBBY SWAMP. — **Location:** Michigan; St. Clair Co.; Michigan Nature Association's Red Wing Acres Sanctuary; 5.5 miles N of Capac; 43°6'N, 82°57'W; Capac Quadrangle, USGS. **Continuity:** New. **Size:** 16.2 ha = 40 acres (square, surveyed). **Description of Plot:** The dominant canopy trees are Cottonwood (*Populus deltoides*) and Black Willow (*Salix nigra*). Most prominent in the understory are Red-osier Dogwood (*Cornus stolonifera*) and Black Willow (*S. nigra*). These same two shrubs make up much of the ground cover. Northern Fox Grape (*Vitis labrusca*), Wild Cucumber (*Echinocystis lobata*), and Poison Ivy (*Rhus radicans*) proliferate as summer progresses. Many weedy plants, including Stinging Nettle (*Urtica dioica*), Bedstraw (*Galium asprellum*) and Orange Jewelweed (*Impatiens capensis*), occupy open areas. A quantitative survey of the vegetation gave the following results: Trees 3 inches in diameter and over, based on five 1/10-acre circular samples, 154 per acre; total basal area 43.4 ft.² per acre. Species comprising 90% of the total number of trees: Cottonwood, 66, 43, 74, 80; Black Willow, 58, 38, 20, 100; Quaking Aspen (*Populus tremuloides*), 16, 10, 4, 40; Slippery Elm (*Ulmus rubra*), 10, 6, 1, 60; White Ash (*Fraxinus americana*), 4, 3, 1, 40. Trees by diameter size class: A (3-6 in.) 76, 49, 7.6, 9; B (6-9 in.) 38, 24, 11.4, 13; C (9-15 in.) 12, 8, 9.6, 11; D (15-21 in.) 22, 14, 39.6, 46; E (21-27 in.) 6, 4, 18.6, 21. Shrub stems per acre: 655,700; ground cover 67%; canopy cover 62%; average canopy height 76 ft (range 70-85). The land was originally part of a drained swamp which was farmed, abandoned, and allowed to grow into its present state. **Edge:** Bordered on the west and the south by similar shrubby swamp. A drainage ditch runs along the north side. The banks of this ditch are overgrown with weeds and tall grasses. Common Burdock (*Arctium minus*) and Teasel (*Dipsacus sylvestris*) are the major plants. Unplowed fields lie immediately beyond the ditch. A narrow dirt road, also overgrown with weeds and impassable much of the year, separates the property from a drier woodland on the east. **Topography:** Flat. **Elevation:** 793 ft. **Weather:** Rain fell during two census trips and one other day was windy; otherwise weather was normal for spring and early summer. **Coverage:** May 18, 22, 29; June 5, 11, 15, 25, 28; July 2. All trips between 0630 and 1030 but one between 1800 and 2100 hours. Total man-hours: 77 plus 20 for habitat description. **Census:** Yellow Warbler, 51 (315, 128); Song Sparrow, 50 (309, 125); Gray Catbird, 39.5 (244, 99); Am. Robin, 29 (179, 73); House Wren, 24 (148, 60); Red-winged Blackbird, 24; Warbling Vireo, 18 (111, 45); N. Oriole, 18; Least Flycatcher, 16 (99, 40); Com. Grackle, 14 (86, 35); Cardinal, 14; Com. Yellowthroat, 13 (80, 33); Mourning Dove, 12 (74, 30); E. Wood Pewee, 11 (68, 28); Wood Thrush, 11; Black-capped Chickadee, 9 (56, 23); Veery, 9; Rufous-sided Towhee, 8 (49, 20); Am. Woodcock, 7 (43, 18); Blue Jay, 7; Rose-breasted Grosbeak, 7; Com. Flicker, 5 (31, 13); Downy Woodpecker, 5; Am. Redstart, 4 (25, 10); Ruffed Grouse, 3 (19, 8); Ovenbird, 3; Ring-necked Pheasant, 2.5; Tufted Titmouse, 2; Virginia Rail, 1; Black-billed Cuckoo, 1; E. Kingbird, 1; Great Crested Flycatcher, 1; Traill's Flycatcher, 1; Com. Crow, 1; White-breasted Nuthatch, 1; Brown Thrasher, 1; Cedar Waxwing, 1; Red-eyed Vireo, 1; Mourning Warbler, 1; Brown-headed Cowbird, 1; Indigo Bunting, 1. **Total:** 41

species; 429 territorial males (2650/km², 1072 per 100 acres). **Remarks:** Seven nests were located: Mourning Dove, Downy Woodpecker, Gray Catbird, Am. Robin 2, Yellow Warbler and Rose-breasted Grosbeak. A mammal study by Joel E. Smith revealed the presence of: E. Cottontail, E. Fox Squirrel, Opossum, White-tailed Deer, Masked Shrew, Short-tailed Shrew, and Meadow Vole. Eastern Garter Snakes and Am. Toads were common. A thirteen-acre strip along the west side is part of a proposed corridor for power transmission lines (765 kv.), from the Greenwood Plant (west of Port Huron, Michigan) of the Detroit Edison Company. The sanctuary is virtually impenetrable except in winter. Water is knee-high and higher in most of the area until June. The remnants of a cattail marsh still remain in the southern part but this is disappearing and being taken over by shrubby growth. In order to conduct the survey it was necessary to cut trails about five feet in width along the proposed grid lines. MNA brought in a survey crew to do the actual clearing of the trails. By late June the trails were waist-high as the cut shrubs and saplings grew again. Sincere thanks to Bertha Daubendiek, James Card, Don Drife, Ellie Cox, Betty Challis and my husband, Pat, for their support and assistance, without which I should never have ventured past the first garter snake. — LAURA C. STRAUSS, *Oakland Audubon Society*, 2335 Pontiac Lake Road, Pontiac, Mich., 48054.



Census 145. Eastern Cottonwoods bordering standing water with emergent vegetation. Photo / Kevin McGowan.

145. SEDGE-RUSH SWALE. — **Location:** Ontario; Norfolk Co.; Port Rowan; 3.2 miles W of Long Point Lighthouse; 42°32'30"N, 80°07'W, Gravelly Bay, Department of Energy, Mines and Resources. **Continuity:** Established 1973. **Size:** 10.32 ha = 25.5 acres (rectangular, laid out in 0.5 acre squares with compass and measuring rope. Roughly 2550 x 50 yds). **Description of Plot:** See AB 27: 1012, 1973. **Weather:** Generally windy and often overcast. **Coverage:** May 28, 31; June 4, 7, 10, 17, 21, 25; July 1, 5. All trips between 0545 and 1300 EST. Total man-hours: 15 censusing and 5 remapping and repairing the grid. **Census:** Red-winged Blackbird, 2.5; Mallard, 1; E. Kingbird, +. **Total:** 3 species; 3.5 territorial males (34/km², 14 per 100 acres). **Remarks:** Three nests were located; Red-winged Blackbird, 2; Mallard, 1. E. Hognose Snakes, N. Water Snakes, Fox Snakes and Muskrats were often seen. Special thanks to the Canadian Wildlife Service for financial assistance. —

GAIL MOSES, ROSS HARRIS, MARILYN SCHUGAR, NEIL BERNSTEIN, KEVIN McGOWAN, GARY MILLER (compiler), *Long Point Bird Observatory, Port Rowan, Ontario. N0E 1M0. Canada.*

146. SHRUBBY SWAMP AND SEDGE HUMMOCKS. — **Location:** Connecticut: Litchfield Co.; north end of Bantam Lake, White Memorial Foundation, Litchfield, 41°43'02"N, 73°12'27"W, Litchfield Quadrangle, USGS. **Continuity:** Established 1965; 8 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:** June 5, 9, 11, 15, 18, 22-24, 27. Hours varied from 0410 to 2300 and totaled about 35. **Census:** Swamp Sparrow, 32 (395, 160); Yellow Warbler, 22 (272, 110); Red-winged Blackbird, 21 (259, 105); Virginia Rail, 15 (185, 75); Com. Yellowthroat, 14 (173, 70); Gray Catbird, 10 (124, 50); Willow Flycatcher, 9 (111, 45); Song Sparrow, 9; Am. Goldfinch, 8 (99, 40); Cedar Waxwing, 6 (74, 30); Wood Duck, 3 (37, 15); Sora, 2; Brown-headed Cowbird, 2; E. Kingbird, 1.5; Mallard, 1; Downy Woodpecker, 1; Alder Flycatcher, 1; Tree Swallow, 1; Long-billed Marsh Wren, 1; Yellow-billed Cuckoo, +; Black-billed Cuckoo, +; Am. Robin, +. **Total:** 22 species; 159.5 territorial males (1971/km², 798 per 100 acres). **Remarks:** The water level, which averaged 1 ft throughout the area, was lower than usual. This may have contributed to the dramatic increase (500%) in Virginia Rails, for even without the use of a tape recorder they were much more in evidence than in previous years; but undoubtedly the use of a tape recorder, for the first time in this area was the major factor in bringing them out. Otherwise things seemed normal, including the usual noisy presence of offshore fishermen, which usually kept the geese, ducks, herons, kingfishers, and potential Pied-billed Grebes (a former breeder), Com. Gallinules, and Am. Coots (former visitors), from using the area by day and some of the night. — ANDREW MAGEE, 34 Hobson St., Springfield, Mass. 01109, sponsored by the Litchfield Hills Audubon Society, Litchfield, Conn.

147. BLUEGRASS-MILKWEED GRASSLAND. — **Location:** Ontario: Norfolk Co.; Port Rowan; 6.08 miles W of Long Point Lighthouse; 42°32'45"N, 80°09'45"W, Little Creek Ridge, Department of Energy, Mines and Resources. **Continuity:** Established 1973. **Size:** 6.68 ha = 16.5 acres (rectangular, laid out in 0.5 acre squares with compass and measured rope, roughly 150 x 550 yds). **Description of Plot:** See AB 27:1013, 1973. **Weather:** Generally warm and sunny. **Coverage:** June 1, 4, 7, 10, 18, 20, 24, 28; July 3, 6. Hours varied from 0600 to 1800 EST, most in the morning. Total man-hours; 26 censusing, 10 hours remapping and repairing the grid. **Census:** Red-winged Blackbird, 3 (45, 18); E. Meadowlark, 1.5; Mallard, 1; Field Sparrow, 1. **Total:** 4 species; 6.5 territorial males, (97/km², 39 per 100 acres). **Remarks:** Six nests were located: Red-winged Blackbird, 4; Mallard, 1; Field Sparrow, 1. Other vertebrates seen included N. Water Snakes, Voles, White-tailed

Deer and Coyote. Special thanks to the Canadian Wildlife Service for financial assistance. — MARILYN SCHUGAR, GEOFFREY L. HOLROYD, GAVIN JOHNSTON, DOUGLAS NAKASHIMA, GARY W. MILLER (compiler), *Long Point Bird Observatory, Port Rowan, Ontario. N0E 1M0. Canada.*



Census 147. View of open rolling dunes showing sparse trees and ground cover of grasses, milkweed and mullein. Photo / Kevin McGowan.

148. PARTIALLY ABANDONED HAYFIELDS AND PASTURES. — **Location:** Connecticut: Fairfield Co., 7 miles N of the Center of Fairfield; 41°12'N, 73°17'W, Westport Quadrangle, USGS. **Continuity:** Established 1971; 4 consecutive years. **Size:** 7.7 ha = 19 acres. **Description of Plot:** See AB 25: 1007-8, 1971. **Weather:** Temperature was above normal in early April and late June, below normal in mid-April, otherwise normal. Precipitation was below normal. **Coverage:** Daily: April 1-July 15. Hours varied from 0001 to 2345 and averaged 2 hours per day. **Census:** Red-winged Blackbird, 34 (442, 179); Am. Robin, 10 (130, 53); Gray Catbird, 9 (117, 47); N. Oriole, 9; Am. Woodcock, 5 (65, 26); Brown Thrasher, 5; Starling, 4 (52, 21); Song Sparrow, 4; Mourning Dove, 3 (39, 16); Chimney Swift, 3; Wood Thrush, 3; Brown-headed Cowbird, 3 females; Cardinal, 3; Field Sparrow, 3; Ring-necked Pheasant, 2; Blue Jay, 2; House Wren, 2; Red-eyed Vireo, 2; Blue-winged Warbler, 2; House Finch, 2; Rufous-sided Towhee, 2; Chipping Sparrow, 2; Bobwhite, 1; Screech Owl, 1; Whip-poor-will, 1; Com. Flicker, 1; E. Kingbird, 1; E. Phoebe, 1; Least Flycatcher, 1; Barn Swallow, 1; Black-capped Chickadee, 1; White-breasted Nuthatch, 1; Mockingbird, 1; Veery, 1; Blue-gray Gnatcatcher, 1; Blue-winged x Brewster's hybrid, 1; Yellow Warbler, 1; Com. Yellowthroat, 1; House Sparrow, 1; Com. Grackle, 1; Rose-breasted Grosbeak, 1; Purple Finch, 1; Am. Goldfinch, 1. **Total:** 43 species plus 1 hybrid; 135 territorial males or females (1756/km², 711 per 100 acres). **Remarks:** Mammals observed included E. Chipmunk, Opossum, E. Gray Squirrel, Striped Skunk, and mole, sp. The number of species rose to 43 from previous totals of 36 (1971), 44 (1972), 37 (1973). Encouraging was the increase in breeding individuals to 135 from 104 in 1973. Robins rose to 10 from 7 last year and N. Orioles rallied to 9 from 7. Increases are especially noted in Am. Woodcock, Gray Catbird, Brown Thrasher and the thrushes.

Distressing was the loss of the breeding E. Meadowlark, missed in this area for the first time in memory. The Bobwhite, woodcock and pheasants reflect a stable game population in the area. Southern species were not as strongly represented as in the past, but the visiting Carolina Chickadees and Orchard Oriole perhaps reflect a long-term trend in the making. The Rose-breasted Grosbeak, once a significant bird on the tract, declined to only 1. For the future, the northeast part of the tract is threatened by a near-by house on which construction started in late July, 1974. — HELEN G. HILLS and CHARLES F. HILLS, 3052 Burr Street, Fairfield, Conn. 06430.

149. OLD FIELD. — **Location:** Pennsylvania; Schuylkill Co., 1 mile SW of the village of Weishampel; 40°41'N, 76°27'W, Tremont Quadrangle, USGS. **Continuity:** New. **Size:** 7.11 ha = 17.58 acres (basically square, 850 ft N-S by 900 ft E-W, delineated by wooden stakes into 16 plots each measuring 170 ft N-S by 180 ft E-W using compass and steel tape). **Description of Plot:** The field was last farmed approximately 11 years ago. It is now in the process of being overgrown with a variety of herbaceous plants, shrubs, and trees. Austrian Pine, (*Pinus nigra*), Red Pine, (*P. resinosa*) and Norway Spruce (*Picea abies*) were planted three years ago in the southern portion of the study area. Five hundred trees of each species were planted, and as of yet they have not affected the general appearance of the field. A wet weather stream runs from north to south, approximately in the middle of the site, and is wooded on both sides. A permanent stream, with trees along its entire length, runs from west to east in the lower part of the plot. A quantitative survey of the vegetation was sampled by listing all species found within 25 ft. of each of the 16 stakes. Two samples, each one m², were taken at each stake giving a total of 32 samples. The 25 most abundant plants are listed in descending order of frequency: Early Goldenrod (*Solidago juncea*), 28; Cinquefoil (*Potentilla canadensis*), 23; Allegheny Blackberry (*Rubus allegheniensis*), 22; Sheep Sorrel (*Rumex acetosella*), 20; Wild Strawberry (*Fragaria virginiana*), 19; Oxeye Daisy (*Chrysanthemum leucanthemum* var. *pinnatifidum*), 17; Little Bluestem (*Andropogon scoparius* var. *frequens*), 16; Queen Anne's Lace (*Daucus carota*), 16; Corn Speedwell (*Veronica arvensis*), 14; Grass-leaved Goldenrod (*Solidago graminifolia* var. *nuttallii*), 14; Poverty Oat Grass (*Danthonia spicata*), 11; Black Cherry (*Prunus serotina*), 10; British Soldiers (*Cladonia cristatella*), 9; Common Mouse-ear Chickweed (*Cerastium vulgatum*), 9; Wrinkle-leaved Goldenrod (*Solidago rugosa*), 8; King Devil (*Hieracium pratense*), 8; Velvet Grass (*Holcus lanatus*), 7; Gray Goldenrod (*Solidago nemoralis*), 7; Sweet Vernal Grass (*Anthoxanthum odoratum*), 5; Hop Clover (*Trifolium agrarium*), 5; Yellow Wood Sorrel (*Oxalis europaea*), 5; Winter Cress (*Barbarea vulgaris* var. *arcuata*), 4; Catfoot (*Gnaphalium obtusifolium*), 4; White Clover (*Trifolium repens*), 4; Canada Bluegrass (*Poa compressa*), 4. [193 other plants listed by author omitted for space — Ed.] **Edge:** Bordered on the N partly by similar habitat and partly by deciduous woods; to the E by deciduous woods; to the S partly by similar habitat and partly by

wet deciduous woods; and to the W by an old field in a late stage of succession. **Topography:** Essentially flat along the S and E portions, sloping to the N and W. **Elevation:** From 800-880 ft. **Weather:** Cool to moderately warm with temperatures ranging from 47 - 68°F. Most count days were clear with some early morning foginess. **Coverage:** May 15, 30; June 3, 12, 19-20, 27, July 8. All trips between 0610 and 0800. Total man-hours: 9. **Census:** Field Sparrow, 19.5 (274, 111); House Wren, 3 (42, 17); Gray Catbird, 3; Com. Yellowthroat, 3; Cardinal, 3; Indigo Bunting, 3; Rufous-sided Towhee, 3; Am. Goldfinch, 2.5; Wood Thrush, 1; E. Bluebird, 1; Blue-winged Warbler, 1; Song Sparrow, 1, Downy Woodpecker, +; Blue Jay, +; Tufted Titmouse, +; Prairie Warbler, +; Yellow-breasted Chat, +. **Total:** 17 species; 44 territorial males or females (618/km², 250 per 100 acres). **Remarks:** White-tailed Deer, Red Squirrel, Am. Toad, and Box Turtle were seen. Special thanks to David Wallesz for assistance in establishing the plot and Albert Mehring for the vegetation analysis. — ROLAND BERGNER, Associate Curator of Natural Science, William Penn Memorial Museum, Box 1026, Harrisburg, Pa. 17108.

150. ABANDONED FIELD. — **Location:** Maryland, Prince George's Co., Accokeek, Piscataway Park, Potomac River, 3 miles W intersection of Route 210 and Bryan Point Road; 38°41'N, 77°4'W, Mt. Vernon Quadrangle, USGS. **Continuity:** Established 1972; 3 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 an exceptionally cool dry one except for a week of heavy rain at the end of June. **Coverage:** April 26; May 14, 20, 24, June 14, 18, 27; July 8, 16; August 1. Nine trips between 0720 and 1010 and one between 1445 and 1645 hours. Total man-hours: 20.5 **Census:** Field Sparrow, 6 (99, 40); Com. Yellowthroat, 4 (66, 27); Indigo Bunting, 4, Cardinal, 2; Bobwhite, 1; E. Kingbird, 1; E. Bluebird, 1; Am. Goldfinch, 1; Song Sparrow, 1; Carolina Chickadee, +; Carolina Wren, +; Blue Grosbeak, +. **Total** 12 species; 21 territorial males or females (346/km², 140 per 100 acres). **Remarks:** Three nests were found Bobwhite, 1; E. Bluebird, 2. Bobwhite and E. Bluebird established complete territories and nested for the first year. Three species — E. Kingbird, Carolina Chickadee, and Blue Grosbeak — established partial territories for the first time. Am. Goldfinches have progressively decreased from 6 territories to 3 to 1; Song Sparrows decreased from 3 the first two years to 1 this year, Cardinals increased by 1. The overall population of the field remained equal to that of 1973. — LEONARD TEUBER (field work) and M. KATHLEEN KLIM-KIEWICZ (compiler), 13117 Larchdale Rd. #2, Laurel, Md. 20811.

151. SMALL TOWN RESIDENTIAL AREA WITH WOODED VACANT LOTS. — **Location:** British Columbia, Fort Nelson; bounded by 6th Ave., Sunset Dr., 2nd Ave., Boundary Rd., Airport Rd., Nelson Dr., vacant lots, and Liard St. N (running clockwise from NW corner); 58°48'N, 122°42'W, Fort Nelson, 94J/15E (which does not show most present built-up areas),

NTS. Continuity: New. **Size:** About 33.2 ha = 82 acres (irregularly shaped, maximum measurements about 900 m E-W and 600 m N-S; street network (irregular) mapped with compass and measured rope). **Description of Plot:** Part of a small (pop. 3500) frontier town undergoing rapid growth, with about one-third of area still vacant (but serviced) and much of this occupied by second-growth woods. About half of the wooded area lies along a steep hillside between 2nd and 3rd Avenues, the rest being in single or double lots and along the centre of each block. One area of about one acre is cultivated, and many houses have vegetable gardens. Of approximately 155 residential buildings, at least 26 may be termed shacks, and another 19 are single or double mobile homes; there are 5 double homes and two apartment blocks, one each of two and four stories. Other buildings include a church, the masonic hall, the R.C.M.P. office, the provincial office building, and two small workshops. Trees are largely Quaking Aspens (*Populus tremuloides*) 15 to 25 ft. tall, with smaller numbers of willows (*Salix* spp.), and a few taller White Spruces (*Picea glauca*) and Balsam Poplars (*P. balsamifera*) in the larger wooded areas. There are few shrubs and hedges around the built-up areas, although there are bushes in all vacant areas and along the wood edges. An area of new houses along 5th Avenue was bare of vegetation at the start of the census period, but lawns were being planted throughout. **Edge:** Spruce woods border the plot to the north, except along 2nd Avenue, while the southern edge is largely brushy vacant lots. A supermarket parking lot adjoins the southwest corner, while a school, hospital, and more houses face the western edge. **Topography:** Fairly flat, on two levels separated by steep escarpment nearly 100 feet high. **Elevation:** about 1350-1450 ft. **Weather:** See Census 133. **Coverage:** June 5, 7, 11, 19, 21, 24, 28; July 3, 8; plus a few observations during the tree survey on July 3. All trips between 0414 and 1138 hours PDT. Total hours: about 15. **Census:** Tree Swallow, 10 (30, 12); Am. Robin, 9 (27, 11); Chipping Sparrow, 7 (21, 9); House Wren, 6 (18, 7); Yellow Warbler, 6; House Sparrow, 5.5 (17, 7); Pine Siskin, 5+ (15, 6); Alder Flycatcher, 4 (12, 5); Starling, 2; Lincoln's Sparrow, 2; Least Flycatcher, 1; Red-eyed Vireo, 1; Purple Finch, 1; White-crowned Sparrow, 1; Com. Flicker, 0.5; Black-capped Chickadee, +; Dark-eyed Junco, +; Clay-colored Sparrow, +; White-throated Sparrow, +. **Total:** 19 species; 61

territorial and non-territorial males (184/km²; 74 per 100 acres). **Remarks:** Dogs were numerous, but cats were seldom seen. The only nests seen or inferred were of hole-nesters: Starling, Tree Swallow and House Wren. Several other species were seen carrying food without the nest being found. Most species found here which are not typically considered as "urban birds" were in the more densely vegetated areas. Species which were generally distributed were Tree Swallow, robin, Yellow Warbler, House Sparrow, Pine Siskin, and Chipping Sparrow, which are also the most abundant birds. Starling, which is probably a recent arrival in this area, seemed to be nesting only in trees; presumably they will overflow into holes in buildings when their numbers exceed available tree cavities. The overall density found is low for an urban area, largely because the community is still too new and too remote to have yet been overrun by House Sparrow, Starling, and Rock Dove which dominate most North American towns and cities. The variety of species, and also the density found, are higher than in natural climax communities of birds in this region. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Ont., Canada K1A 0H3.*

152. URBAN, RESIDENTIAL. — **Location:** California; Orange Co., Huntington Beach, south of Edinger Ave., east of Bolsa Chica St. **Continuity:** New. **Size:** 13.2 ha = 32.6 acres (450 yds x 350 yds, paced) **Description of Plot:** Housing tract built in 1959, trees mostly deciduous averaging 30 ft in height, 13 per acre **Edge:** Bordered on all sides by similar housing tracts, land off the NW corner is the Seal Beach Naval Weapons Station (mostly open land with some marsh habitat). **Topography:** Flat. **Elevation:** 40 ft. **Weather:** Moderate and dry throughout census period. **Coverage:** April 29-30; May 7-8, 15; June 10-12. All trips between 0530 and 0700 hrs. Total man-hours: 12. **Census:** House Sparrow, 41 (311, 126); House Finch, 14 (106, 43), Spotted Dove, 6 (45, 18); Mourning Dove, 4 (30, 12), Mockingbird, 3 (23, 9); Starling, 2; Ring-necked Pheasant, 1; Am. Goldfinch, 1. **Total:** 7 species; 67 territorial males (508/km², 206 per 100 acres). — ROSS E LANDRY, *16181 Tomas Ln., Huntington Beach, Calif., 92649.*