

Warbler, 5 (33); Rufous-sided Towhee, 5 (33); Wood Thrush, 4 (27); Am. Redstart, 4 (27); Acadian Flycatcher, 3 (20); Least Flycatcher, 3 (20); Red-eyed Vireo, 3 (20); Black-and-white Warbler, 3 (20); Worm-eating Warbler, 3 (20); Golden-winged Warbler, 3 (20); Ovenbird, 3 (20); Black-throated Blue Warbler, 2.5; Great Crested Flycatcher, 2; E. Wood Pewee, 2; Blue-gray Gnatcatcher, 2; Yellow-throated Vireo, 2; Cerulean Warbler, 2; Indigo Bunting, 2; Downy Woodpecker, 1; Tufted Titmouse, 1; Scarlet Tanager, 1; Rose-breasted Grosbeak, 1; Yellow-billed Cuckoo, +; Pileated Woodpecker, +; Red-bellied Woodpecker, +; White-breasted Nuthatch, +; Catbird, +; Brown-headed Cowbird, +; Cardinal, +. **Total:** 30 species; 67 territorial males (447 per 100 acres). **Visitors:** Ruby-throated Hummingbird, Com. Crow, Black-capped Chickadee, Cedar Waxwing, Yellow-breasted Chat, Am. Goldfinch. **Remarks:** Number of nests found: Chestnut-sided Warbler, 2; Rufous-sided Towhee, 2; Ovenbird, 1 with 4 young; Golden-winged Warbler, 1 with 4 eggs; Wood Thrush, 1. This is the second in a series of studies to be done at five-year intervals to show the species and population changes as the cut-over brushy area reverts back to mature forest. Natural changes in the habitat are clearly visible. The canopy is now nearly closed and the sprouts and seedlings have grown to a height of 20 to 25 feet. The blackberry, still the dominant plant, is impenetrable in some places. The logging trail used as the centerline is overgrown. The shaded slope to the west of the centerline shows evidence of deer browse. The blackberry has not invaded this portion of the plot, so it is relatively open with a thin ground cover of herbaceous plants. Stumps and logs are in an advanced stage of decay. The Worm-eating Warbler, not found on the area five years ago, now occurs and Ovenbirds have increased from 1 to 3. The number of Wood Thrushes doubled; all west of the centerline. Chestnut-sided Warblers, as was expected with the progressive growth, decreased from 17 to 10 and Indigo Buntings dropped from 8 to 2. Catbirds declined from 2 to plus (+) and Yellow-breasted Chats from 1.5 to a visitor. Blue-gray Gnatcatcher, Tufted Titmouse and Worm-eating Warbler were new species on the study plot. Blackburnian Warbler, found five years ago, was not listed. Comparison of 1966 and 1971 results show that this area still supports exactly the same number of territorial males. The decrease in populations of some species was equalized by the appearance of new species and increases in some of the ones found before. — NEVADA LAITSCH (compiler) and VIRGINIA OLSEN, *Brooks Bird Club, Inc., Wheeling, W. Va. 26003.*

50. POWERLINE CLEARING THROUGH UPLAND MIXED FOREST. — **Location:** North Carolina; in William B. Umstead State Park, 7 miles northeast of the Capitol at Raleigh; 35°51'N, 78°44'W, Raleigh quadrangle, U.S.G.S. **Size:** 8 acres (120 x 2904 feet, measured by pacing and with rope). **Topography:** This powerline section crosses a ¼ mile wide ridge between two creeks. The elevation varies from 380 to 300 feet. The census plot starts on top of the ridge and gradually slopes downward, although the slope is inter-

rupted by two small dips. **Description of Area:** There are two distinct habitats within the area: The center strip with an average width of 50 feet, consisting of one foot high grasses and shrubs, and two side strips each averaging 35 feet in width and generally composed of a thick growth of hardwood trees 15 to 20 feet high. The only bare ground is a one foot wide path which runs the length of the census plot. No one plant dominates the center strip, although Poison Ivy (*Rhus radicans*), Blackberry (*Rubus argutus*), Japanese Honeysuckle (*Lonicera japonica*), and two unidentified grasses are common. Numerous other weedy plants grow in this strip but, except for thistle (*Carduus* sp.), they are of lesser importance. Scattered trees up to four feet tall also grow in this strip; the most common are Com. Persimmon (*Diospyros virginiana*), White Oak (*Quercus alba*), E. Redbud (*Cercis canadensis*), Smooth Sumac (*Rhus glabra*) and Shining Sumac (*Rhus copallina*). In the two side strips most of the trees are about 15 to 20 feet high, with the exception of Tulip-tree (*Liriodendron tulipifera*) and E. Red Cedar (*Juniperus virginiana*) which are up to 30 feet high. White Oak, Flowering Dogwood (*Cornus florida*), Red Maple (*Acer rubrum*), and Tulip-tree are the most important species while Mockernut Hickory (*Carya tomentosa*), E. Redbud, Sweet Gum (*Liquidambar styraciflua*), and Sourwood (*Oxydendrum arboreum*) are also found in significant numbers. The trees in these side strips grow very closely together and, consequently, the foliage is very thick. The ground is littered with many rotting logs and branches, but the only low plants are occasional seedlings of the same species of trees found in the low canopy. **Edge:** Because this area is so narrow (120 feet), the edge plays a significant part in the census. The edge is all upland forest of varying types. Approximately half of the surrounding forest is dominated by 75 foot tall White Oak with lesser numbers of Shortleaf Pine (*Pinus echinata*), N. Red Oak (*Quercus rubra*), and Tulip-tree. Trees of the same species and Flowering Dogwood occupy the middle level while occasional seedlings and Poison Ivy grow at ground level. About 25% of the edge is pine forest with Shortleaf Pine and Loblolly Pine (*Pinus taeda*) dominating the canopy. The height of these trees ranges from 35 to 60 feet. Under the pines grow Red Maple and Sweet Gum up to 25 feet, and Poison Ivy, Blackberry, and Japanese Honeysuckle grow along the ground. The remaining forest is generally a combination of these two forest types. **Coverage:** May 15, 18, 20, 26; June 2, 7, 11, 22; July 4, 11. Most observations were made between 6:15 and 8:30 a.m. Each trip averaged one hour and 15 minutes; the strip was usually walked four times per visit. Total man-hours: 14. **Census:** Indigo Bunting, 5 (62); Cardinal, 3 (38); Prairie Warbler, 2; Carolina Wren, 1; Rufous-sided Towhee, 1; Brown Thrasher, +; Yellowthroat, +; **Total:** 7 species; 12 territorial males (150 per 100 acres, but extrapolation to 100 acres of little value). **Census of Edge** (singing males with territories immediately bordering and often including the census plot): Red-eyed Vireo, 2; Parula Warbler, 1; Hooded Warbler, 1; Summer Tanager, 1; Great Crested Flycatcher, +; Yellow-throated Vireo, +; Pine Warbler, +; Kentucky Warbler, +; **Visitors** (aver-

age number of different individuals per trip): Carolina Chickadee, 4; Blue-gray Gnatcatcher, 3; Mourning Dove, 1; Ruby-throated Hummingbird, 1; Tufted Titmouse, 1; Yellow-shafted Flicker, 0.5; Brown-headed Cowbird, 0.5; Am. Goldfinch, 0.5; Pileated Woodpecker, +; Blue Jay, +; Wood Thrush, +; Solitary Vireo, +; Am. Redstart, +; Com. Grackle, +; Chipping Sparrow, +; **Remarks:** This particular plot was chosen because it is at least one mile in all directions from any large open areas and because of its uniform upland, wooded edge. Although 8 acres is a very small census plot, I was not able to find a longer powerline clearing with similar qualities that does not cross a creek. The birds found in clearings along creeks in this area are significantly different from those found on this census. The major problem encountered with so narrow a plot (120 feet wide) was deciding which species and which individual birds had territories restricted to the powerline and which merely included it in their territories. The Indigo Buntings and Prairie Warblers were obviously restricted to the powerline clearing, and their territories were in a distinctly linear arrangement. The Cardinal and Carolina Wren, however, are common in the surrounding woods, so I could not tell whether or not their territories were restricted to this plot. Since they are generally birds of edges, they were included in the regular census list. On the other hand, the Red-eyed Vireos and Summer Tanager were not included in the census list even though they often sang and foraged in the plot and in the tall trees overhanging the plot. I felt certain that the major part of their territories was outside the powerline strip since there is little suitable nesting habitat within the census area. The plot was used by more visitors than breeders as the surrounding woodlands generally offer better nesting sites. Birds used the two side strips much more than the center strip. However, the Am. Goldfinches (which fed on thistle), Ruby-throated Hummingbirds, and the single Chipping Sparrow used the center strip almost exclusively. This low vegetation was also used to some extent for foraging and occasionally for singing by Indigo Buntings, Cardinals, Prairie Warblers, and Rufous-sided Towhees. The high-voltage wires and the five steel towers were sometimes utilized for perching. A pair of Mourning Doves and Red-tailed Hawks (outside the census area) used the powerline only for perching. Summer Tanagers and Brown-headed Cowbirds also occasionally perched on the towers and wires. Several small birds were observed having difficulty perching on the towers since the braces were too thick for secure footing. — EDMUND K. LEGRAND, 331 Yadkin Drive, Raleigh, N. C. 27609.

51. LIVE OAK-MESQUITE BRUSHLAND —

Location: Texas; Northeast Preserve, city park of San Antonio, located 2 miles northeast of San Antonio International Airport. Study area is along the northern boundary of the park, extending 660 yards east-southeast of Jones-Maltsberger Road and 220 yards south-southwest of fence. **Size:** 12.1 ha = 30 acres, based on survey stakes along the fence and measured outward 220 yards by steel tape. **Description of Area:**

see *Audubon Field notes* 21: 472-473 (1967). **Weather:** This season was characterized by dry feet, open trails and dormant trees and shrubs instead of dense White-bush (*Lippia ligustrina*) growing into the trails, often wet with dew and drizzle. Grasses and herbs made no growth until June; trees were late and sparsely leaved. Rainfall from November through the middle of June was 4 inches, some 12 inches below normal and the driest on record for the period. **Coverage:** March 20, 27, 28, 31; April 8, 13, 15, 17, 21, 24, 25, 29; May 5, 13, 20, 22, 26, 29; June 10. Trips, between 6:20 and 10:00 a.m., C.S.T., totaled 40 hours. **Census:** Cardinal, 18.5 (152, 62); Black-crested Titmouse, 4.5 (37, 15); Painted Bunting, 4.5 (37, 15); Yellow-billed Cuckoo, 4 (33, 13); Mourning Dove, 3 (25, 10); Verdin, 3 (25, 10); Brown-headed Cowbird, 2.5 females; Carolina Wren, 2; White-eyed Vireo, 2; Bewick's Wren, 1.5; Ladder-backed Woodpecker, 1; Bobwhite, +; Golden-fronted Woodpecker, +; Ash-throated Flycatcher, +; Carolina Chickadee, +; Mockingbird, +; Summer Tanager, +; Lesser Goldfinch, +. **Total:** 18 species; 46.5 territorial males (or females) (383 per square kilometer, 155 per 100 acres). **Visitors:** Black Vulture, Turkey, Ground Dove, Chuck-will's-widow, Com. Nighthawk, Black-chinned Hummingbird, Scissor-tailed Flycatcher, Blue-gray Gnatcatcher, Orchard Oriole, Pyrrhuloxia, Blue Grosbeak, Lark Sparrow. **Remarks:** Nests found: Cardinal, 9; Verdin, 2 (known to be active); Ladder-backed Woodpecker, 1; and Black-crested Titmouse, 1. The first two Cardinal nests, found May 13, were exposed owing to slow growth of leaves on the small Cedar Elms. The eggs disappeared from these nests placed within 3 feet of the ground, but a nest 10 feet above ground had 2 young on June 10. Cardinal territories and nests found were both high for the 5-year census. Painted Bunting territories, lowest for the period probably owing to lack of low cover, had been decreasing. Bewick's Wren territories have declined steadily from 7 in 1967 to 1.5. The Black Vulture failed to nest in the spot used the preceding 4 years and although adults were flushed from other areas, no nest could be found. The Golden-fronted Woodpecker was recorded regularly with a territory south of the area. Verdins were recorded more often, partly due to good visibility, with immature birds seen near one nest — LORENZO R. CUESTA, JAMES F. GOODNO, JAMES GRAY, NEIL LAMB, and JAMES A. MIDDLETON (compiler), *San Antonio Audubon Society, Witte Memorial Museum, 3801 Broadway, San Antonio, Tex. 78209.*

52. JUNIPER-SAGE UPLAND. — Location:

Oregon; about 11 miles north of Frenchglen, west of State Highway 205; 42°59'N, 118°53'W. **Size:** 16.2 ha = 40 acres (square). **Description of Area:** Steep, rocky rangeland typical of much of eastern Oregon. Western Juniper (*Juniperus occidentalis*) covers approximately 30% of the plot. About 650 junipers (16 stems per acre) are present on the plot, with most trees varying from 6 to 18 inches DBH and averaging 15 to 20 feet in height. Big Sage (*Artemisia tridentata*) is the dominant species of shrub, with small amounts of heavily browsed Saskatoon Serviceberry (*Amelanchier alni-*

folia), Choke Cherry (*Prunus virginiana*), Golden Currant (*Ribes aureum*) and Gray Horsebrush (*Tetradymia canescens*) also present. Grasses include Thurber Needle Grass (*Stipa thurberiana*), Idaho Fescue (*Festuca idahoensis*), Sandberg Blue Grass (*Poa secunda*), Cheat Grass (*Bromus tectorum*), Bottlebrush Squirreltail (*Sitanion hystrix*), Bluebunch Wheat Grass (*Agropyron spicatum*), and Great Basin Giant Wild Rye (*Elymus cinereus*). Needle Grass predominates on open gradual slopes, while Idaho Fescue forms the primary grass cover on north-facing slopes. Wild rye is found widely scattered, especially along portions of the intermittent stream bed. Cheat Grass frequents open areas throughout the plot, but is heaviest on southern exposures. Numerous annual and perennial forbs bloom in profusion during the spring. Several species of crustose lichens survive on the rock substrate. An average annual rainfall of approximately 9 inches, coupled with the thin and rocky soil, results in keen competition among plants for the little available moisture. This is reflected by relatively wide spacing of trees and shrubs and large areas of bare space exposed. Scientific names are from Hitchcock, Cronquist, Ownbey, and Thompson *Vascular Plants of the Pacific Northwest*, 1961. **Edge:** Essentially similar habitat conditions surround the plot, except for the presence of a massive rhyolite rim and talus slope towering above the plot to the west. **Topography:** Varies from approximately 4200 feet in elevation at the eastern end of the old stream bed to approximately 4550 feet at the head of the ridge to the south. Many different combinations of slope and aspect are represented in the widely varied terrain. **Coverage:** April 22; May 2, 6, 14, 23; June 3, 4, 12, 30. Hours varied from 5:04 a.m. to 9:30 p.m. All counts in morning except evening count on June 3. Field work man-hours, 72; census man-hours, 48. **Census:** Rock Wren, 10 (62, 25); Chipping Sparrow, 3 (19, 8); W. Meadowlark, 2.5; California Quail, 2; Chukar, 2; Brown-headed Cowbird, 2; Lark Sparrow, 2; House Finch, 1.5; Mourning Dove, 1; Ash-throated Flycatcher, 1; Black-billed Magpie, 1; Com. Bushtit, 1; Robin, 1; Green-tailed Towhee, 1; Brewer's Sparrow, 1; Sparrow Hawk, 0.5; Great Horned Owl, 0.5; Com. Nighthawk, 0.5; Loggerhead Shrike, 0.5; Lazuli Bunting, 0.5; Red-tailed Hawk, +; Prairie Falcon, +. **Total:** 22 species; 34.5 territorial males (213 per square kilometer, 86 per 100 acres). **Visitors:** Average number seen/number of censuses seen: Turkey Vulture, 3/6; Marsh Hawk, 1/2; Red-shafted Flicker, 2/3; W. Kingbird, 1/2; Say's Phoebe, 4/1; Dusky Flycatcher, 3/1; Barn Swallow, 1/3; Com. Raven, 1/8; Mountain Chickadee, 1/1; Ruby-crowned Kinglet, 5/4; Cedar Waxwing, 2/1; Orange-crowned Warbler, 1/1; Townsend's Warbler, 3/1; Wilson's Warbler, 3/1; Red-winged Blackbird, 7/1; Bullock's Oriole, 1/1; Brewer's Blackbird, 3/1; W. Tanager, 2/2; Rufous-sided Towhee, 1/1; Oregon Junco, 2/2; White-crowned Sparrow, 2/1. **Remarks:** An unusually cold, windy spring gave way in June to stifling summer heat, so it never became apparent just when the peak of territorial singing was reached. On early visits Ruby-crowned Kinglets gave the impression that they intended to nest, but later disappeared to higher altitudes. A Black-billed Magpie

nest containing 3 eggs was located in a W. Juniper on April 22. It contained 7 eggs on May 6 but was inexplicably empty on May 14. A Lark Sparrow nest under a Big Sage contained 5 eggs on June 4, and 5 young on June 12. A Chipping Sparrow nest with 4 young was found in a Big Sage on June 12. Two adult Loggerhead Shrikes were accompanied by 3 young, still incapable of sustained flight, on June 30. A pair of Rock Wrens protectively flanked 2 fledglings on June 30, and several pairs were observed carrying food. The Prairie Falcons nested on a rock ledge high on the rhyolite rim. Two downy chicks and an apparently infertile egg were observed in the nest on May 23; the young birds were fledged but were in the vicinity of the eyrie on June 30. Canyon Wrens also nested on the rim adjacent to the study plot. Other vertebrate species observed within the study area were Black-tailed Jackrabbit, Mountain Cottontail, Golden-mantled Ground Squirrel, Least Chipmunk, Deer Mouse, Coyote, Badger, Spotted Skunk, Mule Deer, Blue Racer, Bull Snake, W. Fence Lizard, and Sagebrush Lizard. Our appreciation is due Eldon McLaury, who assisted with vegetational analysis. — WALT and BECCI ANDERSON, *Malheur National Wildlife Refuge, P.O. Box 113, Burns, Ore. 97720.*

53. DISTURBED COASTAL CHAPARRAL. — Location: California; 4 miles northwest of Bolinas, Marin County, and 0.16 mile inside the southern boundary of Point Reyes National Seashore; 35°55'N, 122°45'W, Bolinas Quadrangle, U.S.G.S. **Size:** 14 acres (approximately rectangular, 700 x 850 feet, measured). In addition 6 acres adjacent to the larger plot, consisting of different vegetation, were censused. **Description of Area:** About ¼ acre of the eastern corner was a gravel parking lot. The point quarter method (*Ecology*, 37: 451-460, 1956) was used to determine species composition. Coyote Bush (*Baccharis pilularis*) was the only bush encountered. The whole plot was cultivated for oats and vetch until 1965. Since 1969 a 600 foot line transect within the plot has measured the change in *Baccharis* ground cover and overstory; the ground cover has increased from 0.7 to 2.7% and the overstory has increased from 5 to 11.7%. The following annuals and perennials were identified: Bracken (*Pteridium aquilinum*), Scarlet Pimpernel (*Anagallis arvensis*), Sheep Sorrel (*Rumex acetosella*), Ribwort (*Plantago lanceolata*), Red Maids (*Calandrinia ciliata*), lupine (*Lupinus* sp.), Mission Bells (*Fritillaria lanceolata*), Shepherd's Needle (*Scandix pecten-veneris*), California Blackberry (*Rubus ursinus*), Lotus sp., Spurrey (*Spergula arvensis*), Wild Geranium (*Geranium dissectum*), Wild Radish (*Raphanus sativus*), Wild Cucumber (*Marah fabaceus*), vetch (*Vicia* sp.), Wild Oats (*Avena fatua*), Harding Grass (*Phalaris tuberosa*), Sow Thistle (*Sonchus oleraceus*), Coast Tarweed (*Hemizonia corymbosa*), Hairy Cat's Ear (*Hypochoeris radicata*), thistle (*Cirsium* sp.), California Cudweed (*Gnaphalium californicum*), Purple Cudweed (*G. purpureum*), Cotton Batting Cudweed (*G. chilense*). **Edge:** The vegetation on the northwestern edge of the plot changes immediately to a mixture of Wild Radish, various thistles, grasses and

clumps of Coyote Bush. This area was cultivated as a large vegetable garden until 1965. The northeastern edge was similar to the plot except for a gravel road located about 100 feet from the plot boundary. The southeastern edge was similar to the plot for about 50 to 100 feet where the land drops off abruptly into the heavily wooded Arroyo Hondo. The southwestern edge is similar to the plot for 50 feet where dense coastal shrub occurs for 50 to 100 feet and then the terrain drops abruptly forming cliffs above the Pacific Ocean. **Weather:** Morning fog is common and was present on four of the eight visits. Two other visits were overcast with high fog. Rainfall from February 1 to June 30 was 8.3 inches. There are often afternoon winds of from 10 to 20 m.p.h. **Coverage:** March 29; April 13, 25; May 11; June 5, 17, 25; July 1. Times of visits ranged between 6 and 11 a.m.; 16 hours plus an unmeasured amount of time spent finding nests and following individuals. **Census:** White-crowned Sparrow, 6 (43); Am. Goldfinch, 2; Song Sparrow, 1. **Total:** 3 species; 9 territorial males (64 per 100 acres). **Visitors:** Sharp-shinned Hawk, Sparrow Hawk, Red-shafted Flicker, Tree Swallow, Rough-winged Swallow, Barn Swallow, Cliff Swallow, Scrub Jay, Com. Raven, Com. Bushtit, Wrentit, Robin, W. Bluebird, Starling, Red-winged Blackbird, Brewer's Blackbird, Brown-headed Cowbird, Black-headed Grosbeak, House Finch, Pine Siskin. **Remarks:** Nests found: White-crowned Sparrow (7). One pair produced 3 nests; 8 young fledged during the census period and four just after the end of the period. Another pair fledged 3 young from their first nest but lost their second clutch of 4 eggs to a predator. A third female lost her first clutch of 3 eggs to predation and deserted 3 young in her second nest. The 3 nests that were unsuccessful were within the census plot and the four that fledged young were from 10 to 100 feet outside the plot boundaries; Am. Goldfinch (2). The first contained 4 young on June 5. The second was under construction on June 17 and contained 5 eggs on June 23 and 25; Song Sparrow (1). This nest was just outside the plot boundary. The 4 young fledged on April 21. In the 6 acres bordering the northwest edge of the larger plot there were 5.5 Song Sparrow and 0.5 White-crowned Sparrow territorial males. The Song Sparrow listed under Census was composed of two fractional territories, their presence owing to the immediate change of ground cover mentioned under Edge. In fact, the larger 14-acre plot was even less useful to breeding birds than the small number of species listed would indicate. The goldfinches gathered nest material and built their nests near the center of the plot, but they often fed at some distance from the nest with other goldfinches and Pine Siskins. The White-crowned Sparrow was the only bird to use the plot to a large degree. However, only one (unmated) of the 6 territorial males had his entire territory within the plot boundaries. Two other unmated males had most of their territories within the plot. Two mated males had only one half of their territories within the plot. Ninety and 75% of the territories of two other mated males were within the plot, although the latter used the area outside the plot more intensively. Thus, of the 7 male White-crowned Sparrows, 3 were un-

mated, 3 mated males were influenced by edge effect and all successful nests were located outside the plot boundaries. — VINCE VESTERBY, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

54. COASTAL CHAPARRAL. — **Location:** California; 4 miles NW of Bolinas, Marin County, and ¼ mile inside the southern boundary of the Point Reyes National Seashore about 500 yards northwest of the Observatory headquarters; 37°55'N, 122°45'W, Bolinas Quadrangle, U.S.G.S. **Size:** 15 acres (approximately a rectangle 450 x 1500 feet, measured). **Description of Area:** The plot is located about 900 feet from the Pacific Ocean. Two gently sloping ravines approximately 6 feet deep traverse the area from east to west. The vegetation in the ravines appeared to be slightly more dense than in the rest of the plot. The point quarter method (*Ecology* 37: 451-460, 1956) was used to determine species composition. The relative density of five species of shrubs was as follows: Coyote Bush (*Baccharis pilularis*), 46.9%; California Sage (*Artemisia californica*), 30.4%; Bush Monkey-flower (*Mimulus aurantiacus*), 17.4%; Coffee Berry (*Rhamnus californica*), 3.1%; and Poison Oak (*Rhus diversiloba*), 2.2%. In addition, the following plants were identified: Pacific Sanicle (*Sanicula crassicaulis*), Yerba Buena (*Micromeria chamissonis*), W. Bracken (*Pteridium aquilinum*), California Strawberry (*Fragaria californica*), Lotus sp., bedstraw (*Galium* sp.), Indian Paint-brush (*Castilleja franciscana*), Coast Indian Paint-brush (*Castilleja wightii*), thistle (*Cirsium* sp.), Tidy Tips (*Layia platyglossa*), Red-stemmed Gum-weed (*Grindelia rubricaulis*), Scarlet Pimpernel (*Anagallis arvensis*), hedge-nettle (*Stachys* sp.), Checker Bloom (*Sidalcea malvaeflora*), and Soap Plant (*Chlorogalum pomeridianum*). Thirty-five Douglas-firs (*Pseudotsuga menziesii*) 6-20 feet high were growing on or within 100 feet of the plot. Botanical reference was P. A. Munz, *A California Flora*, 1970. **Topography:** Thirty degree southwest facing slope; elevation varied from 260 to 560 feet. **Edge:** Bounded on all sides by the same habitat, but 100 feet from the southwest edge and 200 feet from the northeast edge was an area which was cultivated in oats as late as 1965, but subsequently has had no disturbance. The vegetation in the surrounding disturbed areas contained grass and scattered Coyote Bush. **Weather:** Fog is common in the mornings with NW winds from 10-20 m.p.h. in the afternoon. Rainfall from February 1 to June 30 during the last four years has been: 1968, 10.42 inches; 1969, 15.65 inches; 1970, 8.32 inches; 1971, 8.35 inches. **Coverage:** April 15, 21; May 2, 6, 10, 12, 15, 16, 18, 31; June 9. Total, 31 hours plus 8 incidental hours. Visits were made between 6 a.m. and 6 p.m. **Census:** White-crowned Sparrow, 10 (67); Wrentit, 9 (60); Rufous-sided Towhee, 6.5 (43); Song Sparrow, 4 (27); Bewick's Wren, 2.5; House Finch, 2; American Goldfinch, 1. **Total:** 7 species; 35 territorial males (233 per 100 acres). **Visitors:** Red-tailed Hawk, California Quail, Mourning Dove, White-throated Swift, Red-shafted Flicker, Barn Swallow, Cliff Swallow, Rough-winged Swallow, Scrub Jay, Lazuli Bunting, Purple Finch, Pine Siskin, Fox Sparrow. The following mammals were seen: Mule Deer (*Odocoileus hemionus*),

Brush Rabbit (*Sylvilagus bachmani*), Long-tailed Weasel (*Mustela frenata*), Gray Fox (*Urocyon cinereoargenteus*). Four nests of the Dusky-footed Wood Rat (*Neotoma fuscipes*) were found in an unusually dense area along one of the gently sloping ravines. Four other species of mammals were known to live in the study area because they were trapped during a concurrent study; Deer Mouse (*Peromyscus maniculatus*), Trowbridge Shrew (*Sorex trowbridgei*), Vagrant Shrew (*Sorex vagrans*), and W. Harvest Mouse (*Reithrodontomys megalotis*). **Remarks:** Nests found: Rufous-sided Towhee (1), in Coyote Bush, 2 feet from the ground on April 29 with two young about 2 days old. Wrentit (4). One found on May 10 with four young; one on May 7 with four young; one on May 17 with three young that fledged the next day; one found on May 10, was completed on May 14 and contained four eggs including one Brown-headed Cowbird's on May 18. On June 9 the only nestling was the cowbird which fledged the next day. All of the Wrentit nests were 2-3 feet off the ground in California Sage. House Finch (2). One found on May 2 with five eggs, had 5 young when checked on May 25. Another was found on April 29 with 5 eggs. Both pairs successfully fledged young from nests which were 6 and 7 feet from the ground in Douglas-fir bows. White-crowned Sparrow (1). A nest found on May 18 with 3 young, 1-2 days old, was two feet from the ground in a California Sage. The female of this pair was the only one-year-old female on the study area. An undetermined number of Allen's Hummingbirds and Scrub Jays foraged continually, but no evidence was found that they were breeding in the study area. A clue to the average age of the birds on the plot was suggested by a sample of individuals caught in traps and nets near or on the study area. Many of the birds were banded from 1966 to 1970. All of the White-crowned Sparrows that were captured were of known age since their original capture was during their first year of life. Ten male White-crowned Sparrows averaged 2.9 years old, while 9 females averaged 2.2 years (total average including males, females and two individuals of unknown sex was 2.7 years). Since all of the captured White-crowns were color banded and many were observed later in the study area, it is assumed that the average age of this species was similar to the sample captured. Lesser numbers of three other species were caught. In these cases only two of 17 were originally captured as hatching year birds. Thus 5 Song Sparrows averaged at least 3.4 years; 9 Wrentits at least 2.2 years, and 3 Rufous-sided Towhees averaged at least 2.7 years. — ROBERT M. STEWART, BARBARA CHAMBERLAIN and HELEN STORY, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

55. LOGGED DOUGLAS-FIR FOREST. — **Location:** California; 4.5 miles south of Olema, and about 200 yards south of the east gate to Lake Ranch; 57°30'N, 122°46'W, Double-point Quadrangle, U.S.G.S. **Size:** 15 acres (approximately rectangular, 500 x 1300 feet, measured). **Description of Area:** Clear-cut in 1958 with less than a dozen Douglas-fir (*Pseudotsuga menziesii*) left standing as snags. The

point quarter method (*Ecology* 37:451-460, 1956) was used to determine species composition of the present vegetation. The relative density of the existing vegetation was Coyote Bush (*Baccharis pilularis*), 43%; Douglas-fir saplings, 35%; Huckleberry (*Vaccinium ovatum*), 17%; other, 3%. **Topography:** Ridge-line, slanting down to the east about 50 feet from 1200 foot maximum. **Edge:** Approximately 125 feet from the west edge was an undisturbed Douglas-fir forest. The north edge and parts of the east edge were extensions of the study plot habitat. The south edge and remaining portions of the east edge were composed of the same vegetation as the study area, but in greater density. **Coverage:** March 28; April 15; May 6, 24; June 1, 6, 13, 16. Seven trips from 7 to 11 a.m. and one trip from 4 to 8 p.m.; 35 man-hours. **Census:** California Quail, 3 (20); Purple Martin, 2; Wrentit, 2; White-crowned Sparrow, 2; Allen's Hummingbird, 1; House Wren, 1; Starling, 1; Olive-sided Flycatcher, +. **Total:** 8 species; 12 territorial males (80 per 100 acres). **Visitors:** Turkey Vulture, Red-tailed Hawk, Band-tailed Pigeon, Red-shafted Flicker, Acorn Woodpecker, W. Wood Pewee, Violet-green Swallow, Robin, W. Bluebird, Pine Siskin. **Remarks:** The Starlings and Purple Martins competed for the same nesting sites in tall snags, about one-half going to each species, with several pairs of each apparently displaced from the plot. Much of the ground area is apparently grazed by deer and occasionally by cattle from a ranch on the border of the National Seashore. — STEPHEN LONG and SHARON LONG, *Point Reyes Bird Observatory, Bolinas, Calif. 94924.*

56. SHRUBBY SWAMP AND SEDGE HUMMOCKS. — **Location:** Connecticut; north end of Bantam Lake, White Memorial Foundation, Litchfield, 41°43'02"N, 73°12'27"W, Litchfield Quadrangle, U.S.G.S. **Size:** 20 acres. **Description of Area:** See *Audubon Field Notes* 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. **Edge:** The delta is bordered on the south by the lake; on the north and west by an encroaching Red Maple swamp-forest; and on the east by an oak ridge. **Coverage:** May 30; June 1, 2, 3, 8, 10, 16, 18, 21, 22, 24, 28, 30; July 2, 6, 7, 9, 13, 14, 20, 22, 23. Hours varied from 4:30 a.m. round the clock to 2 a.m. Total, 46 hours. **Census:** Swamp Sparrow, 35 (175); Red-winged Blackbird, 30 (150); Yellow Warbler, 25 (125); Yellowthroat, 10 (50); Catbird, 9 (45); Traill's Flycatcher (fitz-bew song-type), 8 (40); Am. Goldfinch, 8 (40); Song Sparrow, 7 (35); Mallard, 5 (25); Cedar Waxwing, 5 (25); Traill's Flycatcher (web-o song type), 4 (20); Wood Duck, 2; Virginia Rail, 2; Black-billed Cuckoo, 2; Brown-headed Cowbird, 2; Chestnut-sided Warbler, 1.5; Yellow-billed Cuckoo, 1; E. Kingbird, 1; Tree Swallow, 1; White-eyed Vireo, 0.5; Green Heron, +; Black Duck, +. **Total:** 21 species; 159 territorial males (795 per 100 acres). **Visitors:** *Regular* (average number of individuals per 100 acres); Red-winged Blackbird, 50; Barn Swallow, 45; Com. Grackle, 40; Starling, 30; Bank Swallow, 15; Rough-winged Swallow, 10; Com. Crow, 10; Brown-headed Cowbird, 10; Cliff Swallow, 2; Chimney Swift, +;

Black-capped Chickadee, +; Red-eyed Vireo, +. *Irregular* (number of individuals seen, including those offshore and non-breeders or post-breeding wanderers); Great Blue Heron, 5; Com. Nighthawk, 5; Spotted Sandpiper, 3; Ring-billed Gull, 2; Am. Coot, 1; tern (either Common or Forster's), 1; Black Tern, 1. **Remarks:** There has been a census of this area every year since 1965, except 1970. Habitat change was not noticeable. As a lake and river edge habitat, the entire area is subject to normal fluctuations in the water table. This year, the census began on May 30 with the area totally inundated by 1 to 3 inches with only sedge hummocks still above water. June and July left the area at least 80% dry or merely damp by the end of the census period. General density and number of species were maintained, but there were disappointing lacks owing to several causes. The larger waterbirds have always presented a problem. Most broods are hatched well before the census begins, so it is not known how many, if any, actually nest on the area, or how many bring their broods in from up river or nearby similar marsh habitat. The latter situation undoubtedly covers most broods seen, including those of the Wood Duck. The numbers of Mallard and Wood Duck are obtained by the number of broods seen. Aside from the problem of adult ducks and herons as evidence of local breeding, the situation is further complicated by the increasingly intense use of motorboats on the lake just off the marsh edge, including boating fishermen who are present offshore on the lake and river at all hours of daylight. With this type of pressure, the larger waterbirds are not in the marsh or even in the local area in spite of the fact that their presence in past years, and their occasional presence at dawn, dusk, or at night this year, indicates the potential of the area for cover and food. The Canada Goose flock of mixed adults and young, that peaked during the 1967 census period at 55 individuals, was only rarely seen this year, with never more than a half-dozen adults together. The Pied-billed Grebes, which in 1965, 1966, and 1968 would sometimes be observed just offshore of the census area, were completely absent this year. In 1966 and 1969, Hooded Mergansers had broods a quarter of a mile up river and adults would often frequent the marsh edge. This year they were completely absent as were the adult Blue-winged and Green-winged Teal; both occasionally noted in past years. A pair of Great Blue Herons was observed a short distance up river from the marsh on May 30, but the species did not show up again until mid-July, as post-breeders. A pair of Green Herons was present off and on throughout the census period, but were so shy that they were seen only in the late evening hours, at night, or in the very early morning. The point of this itemizing of missing (or just increasingly reticent) water-birds in comparison with previous censuses is to indicate the strength of the area in terms of potential habitat, as well as to demonstrate their comparative absence from the area owing to the increased pressures of human "recreational" disturbance. Any real census of this area should include its obvious artificially-imposed limitations. Another related example concerns the use of the area by swallows for aerial feeding at dawn and dusk, and for roosting at

night. In past years, a flock of at least several hundred roosting Bank Swallows, their numbers augmented by post-breeding adults and young as the census went on, was a spectacular sight coming and going out over the water. Their near absence led to a quick check of the largest local nesting colony. This year the town of Morris, Conn., began to use the area for public land fill, and virtually every nesting hole was destroyed. Kingfishers, regular visitors to the area until 1968, were completely absent this year. Flocks of mixed blackbirds and Starlings continued to roost by the hundreds as usual. A second pair of Black-billed Cuckoos and the first Yellow-billed Cuckoos for this census area were present. Cuckoos were also more abundant locally than in any previous year since the census began. Up to three Barred Owls hooted from the woodlands to the immediate west, north, and east of the census area. Also during the latter half of the census period, 2 young Great Horned Owls were in dead elm trees less than a quarter of a mile up river. It is not known whether owls of either species actually entered the area. The two song-types of Traill's Flycatchers have seemed to be stably balanced since the census began. The census habitat excludes most of the higher and drier Red Maple edge, which is the preferred habitat of the We-be-o. Red-winged Blackbirds were on the basis of territorially behaving females. Numbers of female cowbirds and rails are believed to be vastly underestimated, but their presence was rarely noted. — ANDREW MAGEE, 34 Hobson Street, Springfield, Mass. 01109, under the direction of the White Memorial Foundation, Inc., Litchfield, Conn.

57. LEATHERLEAF BOG. — Location: Ontario; 3 miles northeast of GERALTON, in the south central part of McQuesten Township, Thunder Bay District, just east of Ashmore Creek; 49°46'N, 86°54'W. Size: 10 ha = 25 acres. Description of Area: Ashmore Creek rises about a mile to the south in Ashmore Lake. It flows in a generally northeasterly direction to join Burrows River, a tributary of Kenogami River, one of the main branches of the Albany River which flows into James Bay. GERALTON is in the Precambrian "hard rock" portion of Ontario. The dominant forest type of the region is Black Spruce. In the bog this forest is reduced to scattered stunted spruces with a few larger Tamaracks in an essentially continuous growth of Leatherleaf in *Sphagnum* "cushion". The water level on the bog was controlled by a low Beaver dam on Ashmore Creek over which we gained access to the plot. The bog is surrounded by typical Black Spruce forest on three sides and by a small lake to the north. Ashmore Creek, with its fringe of alders, paralleled the western border of the plot and flowed into the small, unnamed lake just north of the Beaver dam. The bog was staked out in a 4-chain grid, using 25 stakes (264 ft. apart). The vegetation was noted within 3 feet of each stake. In decreasing order of frequency at the stations we noted: *Sphagnum* (or other water-loving mosses), 24; Dwarf Birch (*Betula glandulosa*), 23; Leatherleaf (*Chamaedaphne calyculata*), 22; Black Spruce (*Picea mariana*), 21; Labrador-tea (*Ledum*

groenlandicum), 20; willows (*Salix* sp.), 20; Bog-Rosemary (*Andromeda glaucophylla*), 19; Three-leaved False Solomon's-seal (*Smilacina trifolia*), 15; various sedges, 10; cottongrass (*Eriophorum* sp.), 8; Speckled Alder (*Alnus rugosa*), 6; Marsh Cinquefoil (*Potentilla palustris*), 6; various grasses, 6; Smooth Horsetail (*Equisetum laevigatum*), 5; Tamarack (*Larix laricina*), 4; Bunchberry (*Cornus canadensis*), 4; Pink Dewberry (*Rubus acaulis*), 4; Wood Horsetail (*Equisetum sylvaticum*), 3; Swamp Fly Honeysuckle (*Lonicera oblongifolia*), 2; goldenrod (*Solidago* sp.), 2; Com. Cat-tail (*Typha latifolia*), 1; Marsh Marigold (*Caltha palustris*), 1; Cloudberry (*Rubus chamaemorus*), 1; Sweet Coltsfoot (*Petasites frigidus*), 1. Species occurring on the plot but not at any of the 25 sample stations included Quaking Aspen (*Populus tremuloides*), Balsam Poplar (*P. balsamifera*), Buckbean (*Menyanthes trifoliata*) and Water Arum (*Calla palustris*). The only mammals observed to be using the bog were the Beaver (*Castor canadensis*), which controlled the water level of the bog and constructed a few narrow channels through it, and a Moose (*Alces alces*) which used the edges of the bog fairly frequently. Many Mink Frogs (*Rana septentrionalis*) and one Am. Toad (*Bufo americanus*) were noted on the plot. Coverage: June 9, 10 (morning and evening), 16, 22 and 23. About 30 man-hours were spent in staking out the plot and about 24 hours in subsequent species mapping. Censuses were made in morning, mid-day and evening but only the early morning hours were very productive. The four early morning mapping sessions started between 6 and 6:30 a.m., E.D.S.T., and lasted about 2 to 2½ hours. Census: Yellowthroat, 20 (80); Swamp Sparrow, 11 (44); Lincoln's Sparrow, 3 (12); Traill's Flycatcher, 2.5; Palm Warbler, 1.5; Am. Bittern, 1; Black Duck, 1; Sora, 1; Swainson's Thrush, 1; Mallard, 0.5; Com. Snipe, 0.5; Tree Swallow, 0.5; Gray Jay, 0.5; Com. Raven, 0.5; Golden-crowned Kinglet, 0.5; Ruby-crowned Kinglet, 0.5; Wilson's Warbler, 0.5; Rusty Blackbird, 0.5; White-throated Sparrow, 0.5. Total: 19 species; 47 territorial males (188 per 100 acres). Visitors: Com. Loon (frequently flew over the plot between the lakes to the north and south of the plot), Black-billed Cuckoo, Hairy Woodpecker, Olive-sided Flycatcher, Winter Wren, Cedar Waxwing, Red-eyed Vireo, Magnolia Warbler, Myrtle Warbler, Connecticut Warbler, Red-winged Blackbird, Com. Grackle. Most of these had territories in the adjacent forest. Remarks: When we started staking the plot on May 25, an Am. Bittern was flushed from a nest with 3 eggs and a Mallard from a nest with 6 eggs. When we continued with the staking on May 26 a Black Duck was flushed from a nest with 4 eggs. We completed the staking on May 27. The nest of the Am. Bittern had 6 eggs when visited on June 10 and 5 young when visited on June 23. The fate of the two duck nests is not known but both were empty on June 10 though adults of both species continued to fly over the plot. We wish to acknowledge with thanks the financial support of the Canadian National Sportsmen's Show. — DAVID ELDER, DONALD PRICE and J. MURRAY SPEIRS (compiler), Department of Zoology, University of Toronto, Ont., Canada.

58. HAYFIELDS AND PASTURE. — Location: Quebec; about 1.3 miles south-southeast of Boulé, Palmarolle Twp., Co. Abitibi-Ouest; southeast corner of plot is near 48°35'N, 79°06'W, on sheet 32 D/11 East, Palmarolle, National Topographic Series. Size: 40 ha = 98.8 acres (measured with 50-meter rope and compass, along fence lines; rectangular, 800 x 600 meters, with a block 275 x 250 meters omitted from the northeast corner and minor irregularities along a creek and former woodlot on the west edge). Description of Area: Part of an agricultural area, roughly 5 miles E-W by 4 miles N-S, mostly cleared except for small plots of second-growth Quaking Aspens (*Populus tremuloides*), between Palmarolle and Poularies Rivers, on the plain southeast of Lake Abitibi. The plot includes parts of three fields planted for hay, and of two others used as pasture. All fields, including those now pastured, show evidence of having been plowed in the past, and the seeding lines are frequently still visible, although the surface seemed too smooth to have been plowed in 1970. The vegetation was estimated from 15 samples, each 5 meters square, spaced at regular intervals throughout the plot. Plants identified on 8 or more samples included, in descending order of frequency: Com. Timothy (*Phleum pratense*), on 15 samples (important on 11); Com. Dandelion (*Taraxacum officinale*), 15 (2); Tufted Vetch (*Vicia cracca*), 14; Tall Buttercup (*Ranunculus acris*), 13 (2); Red Clover (*Trifolium pratense*), 13 (1); Wild Strawberry (*Fragaria virginiana*), 12 (1); Field Horsetail (*Equisetum arvense*), 11; White Clover (*T. repens*), 10 (1); Orange Hawkweed (*Hieracium aurantiacum*), 10; Com. Plantain (*Plantago major*), 9 (1); Yarrow (*Achillea millefolium*), 9; Kentucky Blue Grass (*Poa pratensis*), 8 (2). Other plants forming appreciable proportions of the ground cover included Alfalfa (*Medicago sativa*), Red Fescue (*Festuca rubra*), Wool-grass (*Scirpus atrocinctus*), and two sedges (*Carex* spp.); the last three mainly in ditches. The pastured areas contained the same plants as the hayfields except that Alfalfa was lacking and dandelion and plantain were more common, while all vegetation was much shorter owing to grazing and trampling. Dead grass was locally important in the ground cover, and in the pasture bare earth patches occurred, especially along the fence lines. Low shrubs, especially Balsam Willow (*Salix pyrifolia*), had invaded a damp area (about 2 ha) near the eastern edge; this area was burned in early May, but most of the shrubs survived the fire. A small area (less than 1 ha) along the northern edge was accidentally burned in the last week of June, when brush from a felled windbreak of aspen and Speckled Alder (*Alnus rugosa*) was being burned in the next field. Plant names from M. L. Fernald, *Gray's Manual of Botany*, 8th Ed., 1950. Edge: Similar fields border the plot on all sides with the following exceptions; a plowed field abuts on 100 meters of the northern edge; a windbreak perhaps 10 meters deep, bordering the north edge east of the plowed field; the omitted rectangle to the northeast was occupied by alder and willow shrubbery up to 10 feet tall, with a hydro line right-of-way running diagonally through it; a brook, nearly dry in midsummer, runs along the southwest corner for about 150 meters, its course being bordered

by willows up to 15 feet tall; a woodlot of aspen and alder, now mostly felled and well trampled by cattle, occupies all except 150 meters of the west edge. Fields continue beyond all of these intrusions. **Topography:** Rising gradually to east and north, with a slight drop along the eastern margin; elevation about 940-960 feet. **Coverage:** May 27, 30; June 2, 3, 11, 14, 24, 30. All surveys were made between 5:03 a.m. and 1:07 p.m. and totalled 15.5 hours. A further 6 hours was spent on the area during the initial measuring and the plant survey. **Census:** Savannah Sparrow, 20 (50, 20); Starling, 0.5; Com. Crow, +; Am. Goldfinch, +; Vesper Sparrow, +; Song Sparrow, +. **Total:** 6 species; 20.5 territorial males (51 per square kilometer, 21 per 100 acres). **Visitors** (total number seen): Marsh Hawk, 1; Killdeer, 2; Com. Snipe, 1; Tree Swallow, 1; Starling, 5; Yellowthroat, 1; Lincoln's Sparrow, 1. **Remarks:** Nests found: Savannah Sparrow, 2 (both probably successful). No other species nested on the census plot, which was included within the foraging area of the other species nesting in nearby brushy areas. An old crow nest was found in the brook valley at the southwest corner, and young Starlings were heard begging in the broken woodlot to the west; these species and goldfinches regularly foraged on the plot. Vesper (1) and Song Sparrows (6) held territories adjoining the plot, the former in the pasture to the west and the latter in the wood edges; as both forage on the ground, they presumably used the plot, although neither actually sang on it. Territories in the pastured area were largely restricted to the fence lines, as few elevated song perches remained in the grazed area. However, the density of Savannah Sparrows was not obviously lower there than in the hayfields. These artificial, northern grasslands are rather unusual in lacking icterids almost completely. Bobolinks are very local, and largely in rich, riverbank meadows in this region; meadowlarks are totally absent; and neither Red-wings nor grackles seem to frequent open fields, even for foraging, during nesting season. This niche is apparently filled only by the Starling. W. G. Dore and D. S. Erskine assisted with some plant identifications. — ANTHONY J. ERSKINE, *Migratory Bird Populations, Canadian Wildlife Service, Ottawa, Ont., Canada.*

59. PARTIALLY ABANDONED HAYFIELDS AND PASTURES. — **Location:** Connecticut; 7 miles north of the center of Fairfield; 41°12'N, 73°17'W, Westport Quadrangle. **Size:** 19 acres. **Description of Area:** This is the remains of what was an active farm 25 years ago. About 6 acres of regularly mowed farmland and 6 acres of hayfields have not been cut since 1963. The rest of the area is pasture, a small lawn garden with five buildings and three small strips of cultivated land. Three acres of the uncut hayfields are heavily overgrown with shrubs and small trees, the remaining three acres are comprised of scattered small trees, seedlings and shrubs. Trees along the stonewall boundaries of the lots within the study area, the farm residence buildings, and the eastern end of the area have an average height of 45 feet. Seedlings and small trees have an average height of 7.5 feet. The growth of E. Red Cedar (*Juniperus virginiana*) is becoming quite

prevalent in the southwestern and northeastern sections. For the entire area the prevalent trees are as follows: N. Red Oak (*Quercus borealis*), Red Maple (*Acer rubrum*), Paper Birch (*Betula papyrifera*), apple (*Malus* sp.), White Ash (*Fraxinus americana*), Shagbark Hickory (*Carya ovata*), White Oak (*Q. alba*), Staghorn Sumac (*Rhus typhina*), Am. Beech (*Fagus grandifolia*), Black Cherry (*Prunus serotina*), and Flowering Dogwood (*Cornus florida*). There are scattered individuals of the following trees: Weeping Willow (*Salix babylonica*), Honey-Locust (*Gleditsia triacanthos*), Am. Plum (*Prunus americana*), Black Ash (*F. nigra*), Am. Holly (*Ilex opaca*), Horse-Chestnut (*Aesculus hippocastanum*), Sugar Maple (*A. saccharum*), White Pine (*Pinus strobus*), N. White Cedar (*Thuja occidentalis*), E. Hemlock (*Tsuga canadensis*), Bear Oak (*Q. ilicifolia*), Tulip-tree (*Liriodendron tulipifera*), Shellbark Hickory (*C. laciniosa*), and Pignut Hickory (*C. glabra*). Edge on the boundaries of the area consists mainly of Black Cherry, White Ash, N. Red Oak, White Oak, Red Maple, and Shagbark Hickory. In the hayfield the dominant grasses are: Bluegrass (*Poa* sp.), Orchard Grass (*Dactylis glomerata*), rye grass (*Lolium* sp.), and wild barley (*Hordeum* sp.). The cover for the area includes: Virginia Creeper (*Parthenocissus quinquefolia*), Poison Ivy (*R. radicans*), Goldenrod (*Solidago canadensis*), blueberry (*Vaccinium* sp.), Cinnamon Fern (*Osmunda cinnamomea*), Net-veined Chain Fern (*Lorinseria areolata*), Wineberry (*Rubus phoenicolasius*), Wild Strawberry (*Fragaria virginiana*), Yarrow (*Achillea millefolium*), Am. Red Raspberry (*Rubus idaeus strigosus*), Daisy (*Chrysanthemum leucanthemum*), Dandelion (*Taraxacum officinale*), Am. Bittersweet (*Celastrus scandens*), sunflower (*Helianthus* sp.), Highbush Blackberry (*Rubus allegheniensis*), Smooth Blackberry (*R. canadensis*), Multiflora Rose (*Rosa multiflora*), Pokeweed (*Phytolacca americana*), fleabane (*Erigeron* sp.), grape sp., Jack-in-the-Pulpit (*Arisaema triphyllum*), buttercup (*Ranunculus* sp.), Black-eyed Susan (*Rudbeckia serotina*), blue-eyed grass (*Sisyrinchium* sp.), clover (*Trifolium* sp.), smartweed (*Polygonum* sp.), Steeple-bush (*Spiraea tomentosa*), violet (*Viola* sp.), Bull Thistle (*Cirsium vulgare*), Skunk-cabbage (*Symplocarpus foetidus*), amaranth (*Amaranthus* sp.), Chickweed (*Stellaria media*), Forsythia sp., Lilac sp., Japanese Barberry (*Berberis thunbergii*), Jimsonweed (*Datura stramonium*), Milkweed (*Asclepias syriaca*), Mullein (*Verbascum thapsus*), Dwarf Ragweed (*Ambrosia pumila*), Giant Ragweed (*Ambrosia trifida*), Wild Morning-glory (*Convolvulus sepium*), and Wood Lily (*Lilium philadelphicum*). Elevation is between 350-375 feet. A brook on the eastern side of the area flowed all summer. **Coverage:** Daily from April 15-July 22. Hours varied from 12:01 a.m. to 11:25 p.m. Average daily coverage was 3 hours. **Census:** Red-winged Blackbird, 25 (132); Chipping Sparrow, 15 (79); Catbird, 13 (68); Baltimore Oriole, 13 (68); Robin, 12 (63); Com. Grackle, 10 (53); Song Sparrow, 10 (53); Blue-winged Warbler, 8 (42); Mourning Dove, 5 (26); Blue Jay, 5 (26); Am. Woodcock, 3 (16); Starling, 3 (16); Brown-headed Cowbird, 3 (16) females; Cardinal, 3 (16); Rufous-sided Towhee, 3 (16); Yellow-billed Cuckoo, 2; Chimney Swift, 2; Yellow-

shafted Flicker, 2; Wood Thrush, 2; E. Meadowlark, 2; Rose-breasted Grosbeak, 2; Field Sparrow, 2; Com. Goldfinch, 2; E. Kingbird, 1; E. Phoebe, 1; Least Flycatcher, 1; E. Wood Pewee, 1; Barn Swallow, 1; Black-capped Chickadee, 1; Tufted Titmouse, 1; House Wren, 1; Brown Thrasher, 1; Veery, 1; Red-eyed Vireo, 1; Orchard Oriole, 1; House Finch, 1. **Total:** 36 species; 160 territorial males (842 per 100 acres). **Visitors:** Green Heron, Mallard, Wood Duck, *Accipiter* sp., Ring-necked Pheasant, Bobwhite, Herring Gull, Black-billed Cuckoo, Barred Owl, Long-eared Owl, Whip-poor-will, Com. Nighthawk, Pileated Woodpecker, Red-bellied Woodpecker, Hairy Woodpecker, Downy Woodpecker, Great Crested Flycatcher, Acadian Flycatcher, Bank Swallow, Com. Crow, White-breasted Nuthatch, Mockingbird, E. Bluebird, Blue-gray Gnatcatcher, Yellow Warbler, Magnolia Warbler, Ovenbird, Yellowthroat, Am. Redstart, House Sparrow, Bobolink, Purple Finch, Slate-colored Junco, White-throated Sparrow. **Remarks:** Mammals observed were: E. Chipmunk, Red Fox, Virginia Opossum, E. Gray Squirrel, Star-nosed Mole, Striped Skunk, Short-tailed Weasel, Raccoon, Woodchuck, and White-tailed Deer. Reptiles and amphibians observed were: Common Black Snake, N. Water Snake, garter snake, Green Frog, and Spring Peeper. Approximately 50 domestic hens were an important aid in diminishing the epidemic of Gypsy Moth larvae and span worms that defoliated many trees in the area. This is the first year in memory that neither the Yellowthroat nor the Yellow Warbler nested here. The Orchard Oriole nested for the first time in 55 years of observations on the area. The Acadian Flycatcher was one of a number of birds reported in southern Connecticut this year. The Red-bellied Woodpecker probably nested in a wooded area immediately adjoining the plot, however no proof of breeding was actually found. Nesting density may have declined because of the defoliation of almost all trees (except Tulip-tree, Weeping Willow, and conifers) during June by Gypsy Moth larvae and span worms. — DENNIS VARZA, HELEN HILLS, PETER J. GILL, SR. and CHARLES F. HILLS (compiler). 3052 Burr Street, Fairfield, Conn. 06430.

60. CULTIVATED FIELD AND ABANDONED AIRSTRIP. — **Location:** North Carolina; one-half mile from North Wilkesboro. **Size:** Through misinformation this was listed as 150 acres for the first census in 1959. This has been corrected several times and now stands at 90 acres. **Description of Area:** A nearly level field bordering the Yadkin River at the widest end and extending back from the river for one-third mile. See *Audubon Field Notes* 13: 468 (1959). **Coverage:** April 25; May 10, 20, 23, 27; June 7, 12, 14; with numerous observations throughout the season. Hours varied from 9 a.m. to 6 p.m. and totaled 20 man-hours. **Census:** E. Meadowlark, 5 (6); Bobwhite, 1; E. Kingbird, 1; Traill's Flycatcher, 1; Starling, 1; Yellowthroat, 1; Yellow-breasted Chat, 1; Cardinal, 1; Field Sparrow, 1. **Total:** 9 species; 13 territorial males (14 per 100 acres). **Remarks:** The unharvested Sudan Grass of the 1969 season grew a big crop of weeds in 1970, furnishing nesting sites for a number of species. This was

ploughed in the fall and the weed crop of 1971 did not offer sufficient cover for the nesting season. A large landfill to give access to a proposed shopping center and the area bulldozed for the center, in all comprising 25 acres, reduced the 90-acre tract. Lightly grazed pasture, affording a height of vegetation almost equaling a hayfield, undoubtedly offered nesting sites for the 5 meadowlarks in contrast to the 3 of the 1970 season. The abandoned airstrip, with many trees 15 to 18 feet in height, and a thick understory in many places, provided nesting sites for a number of species. As it adjoins a woodland swamp, some species ordinarily nesting there found suitable locations in the smaller tract. — WENDELL P. SMITH, *North Wilkesboro, N. C. 28659.*

61. HAY FIELD. — **Location:** Ontario; about one mile southeast of Dryden in Concession 4, Lot 1, Van Horne Township, Kenora District, just north of Wabigoon Lake; 49°45'N, 92°52'W. **Size:** 10 ha = 25 acres. **Description of Area:** In order to obtain a plot of this size we found that we had to choose a somewhat irregular shape, with lakeshore marshes cutting into the southeast corner, farm buildings limiting the western border and spruce-aspens forest determining the northern border. Apart from an old fence line and low ditch, which cut diagonally across the northern border, the plot as staked out was fairly uniform hay field. A small patch of goldenrods grew along the ditch, giving taller early season cover. The topography was gently rolling and the soil sandy loam. This field is slated to become part of a recreational park for Dryden. A few cars and pickup trucks began to use the field to gain access to the woodland and lakeshore to the east in the latter part of the breeding season, but they stayed mainly on one track and did not have any appreciable effect on the breeding birds of the area. A 4-chain grid was used to stake out the central body of the field with 2-chain extensions as needed to make up the 25 acres. We used 35 stakes to delineate the area and each stake was used as a vegetation sampling station. The species of plants growing within 3 feet of each stake were noted and are arranged here in decreasing order of frequency: The chief "hay" species were: Com. Timothy (*Phleum pratense*), 27; Smooth Brome (*Bromus inermis*), 18; Kentucky Blue Grass (*Poa pratensis*), 15; Canada Blue Grass (*P. compressa*), 14; Couch Grass (*Agropyron repens*), 10. Growing with these grasses were Red Clover (*Trifolium pratense*), 16; White Clover (*T. repens*), 16; Alfalfa (*Medicago sativa*), 11; vetch (*Vicia* sp.), 8; White Sweet Clover (*Melilotus alba*), 1. The "weedy" component of the vegetation was made up of Com. Dandelion (*Taraxacum officinale*), 26; Com. Yarrow (*Achillea millefolium*), 15; Tall Buttercup (*Ranunculus acris*), 8; Wood Horsetail (*Equisetum sylvaticum*), 5; Sheep Sorrel (*Rumex acetosella*), 5; Ox-eye Daisy (*Chrysanthemum leucanthemum*), 5; Com. Plantain (*Plantago major*), 4; Strawberry (*Fragaria virginiana*), 4; Raspberry (*Rubus idaeus*), 4; Lindley's Aster (*Aster lindeyanus*), 44; Sow Thistle (*Sonchus asper* and *S. uliginosus*), 4; Orange Hawkweed (*Hieracium aurantiacum*), 3; goldenrod (*Solidago* sp.), 3; Com. Chickweed

(*Stellaria media*), 2; sedges, 2. A moss (*Polytrichum* sp.), was found at one station as were the following: a rush, a violet (*Viola* sp.), Quaking Aspen (*Populus tremuloides*), Speckled Alder (*Alnus rugosa*), Creamy Peavine (*Lathyrus ochroleucus*), Canada Thistle (*Cirsium arvense*), three asters (*Aster puniceus*, *A. macrophyllus* and *A. cordifolius*) and Canada Hawkweed (*Hieracium canadense*). Coverage: May 29, 30, 31, (morning and evening); June 6 (morning and evening), 7, 13, and 14. Staked on May 21; vegetation survey on June 26. Five morning censuses were made, starting about sunrise and lasting about two hours. Four evening censuses were made, lasting about 1 1/2 hours, before sunset. Total man-hours were about 34. Census: Bobolink, 20 (80); Savannah Sparrow, 18.5 (74); Le Conte's Sparrow, 3.5 (14); Com. Snipe, 1.5; Com. Crow, 1; Song Sparrow, 1; W. Meadowlark, +. Total: 7 species; 44.5 territorial males (178 per 100 acres). Visitors: Mallard, Short-billed Marsh Wren, Yellowthroat, Am. Redstart, Yellow-headed Blackbird, Chipping Sparrow, Lincoln's Sparrow. Remarks: A pair of Red Foxes crossed the field regularly to and from their den which was located just outside the plot on a wooded hillside overlooking one of the marshes to the southeast. We are indebted to Mrs. Laura Howe for many kindnesses during our stay at Dryden and for assistance on one of the censuses, to J.F. Alex of the Ontario Department of Agriculture and Food for help with the identification of two grass species and to George Kokocinsky of the Ontario Department of Lands & Forests for identifying several of the "weedy" species. We wish to thank many persons on the Dryden staff of the Ontario Department of Lands and Forests for help in locating a suitable field plot — most of the local clearings were too small. Mr. C. Hodgkinson, on whose property the field was located, was most co-operative. Finally we wish to acknowledge with thanks the financial support of the Canadian National Sportsmen's Show. — DONALD PRICE and J. MURRAY SPEIRS (compiler), *Department of Zoology, University of Toronto, Ont., Canada.*

62. WHEAT AND CORN. — Location: Indiana; Goshen. Slightly less than the southeast 40 acres of the northwest quarter of Section 22, T36N, R2W of the Second Principal Meridian, Elkhart County. Size: 15.8 ha = 39.0 acres (rectangular, 438 x 454 yards, with 9945 square yards removed at the corners, determined by steel tape and pacing). The plot was divided as follows: Corn, 11.6 ha = 28.8 acres; Wheat, 3.5 ha = 8.5 acres; road, 0.7 ha = 1.7 acres. Description of Area: Described in *Audubon Field Notes* 23: 550-551, 745 (1969), and *American Birds* 25: 658-659 (1971). The Wheat (*Triticum aestivum*) was 15 cm. tall on April 24, 70 cm. on May 28, and 80 cm. on June 14. It was harvested in early July. The remainder of the plot was plowed in early April, with cattle manure spread on much of the area. Corn (*Zea mays*) was planted in May, and was 8 cm. tall on May 28. The Corn, cultivated for weeds in early June, was 72 cm. tall on June 24 as the canopy over the ground was closing. The final height of the Corn was from 120 to 180 cm., shorter than in previous, normal years. Edge:

The west side of the plot is the athletic field of Goshen College; a trailer court is at the northwest corner. Suburban houses and gardens are along much of the northern edge and northeast corner. The remaining northern and southern borders consisted of Corn. A road, included in the plot on the east side, is further bordered by a developing apartment project and extensive grassy areas. Coverage: March 13; April 17, 24; May 3, 28; June 6, 14, 24; July 22. A total of 9 complete trips between 4:50 and 8:15 a.m., E.S.T., totaling 8 man-hours. Census: Vesper Sparrow, 5 (32, 13); Horned Lark, 4.5 (29, 12); Savannah Sparrow, 2; Robin, 1.5; Killdeer, 1; Red-winged Blackbird, 1; Song Sparrow, 1; Purple Martin, 0.5; E. Meadowlark, 0.5; Chimney Swift, +; Barn Swallow, +; Brown Thrasher, +; Brown-headed Cowbird, + (female). Total: 13 species; 17 territorial males (108 per square kilometer, 44 per 100 acres). Visitors: Mourning Dove, Yellow-shafted Flicker, Starling, House Sparrow, Com. Grackle, and Cardinal. Remarks: The year was unusually dry, with rainfall from March to July totaling 9.77 inches, compared to a 30-year normal of 17.25 inches. In March and April, the equivalent of 1 Horned Lark territory was on the Wheat (4 of the 6 males on the plot had parts of their territories there). After early June there was little Horned Lark activity. Two of 7 Vesper Sparrows had fractions of their territories on the Wheat. Much Vesper Sparrow activity was associated with fences around the edge of the plot. Savannah Sparrows were almost entirely confined to the Wheat. Three Robin males were associated with trees and fences on the edge of the Corn, with three more directly north of the plot in the housing district. Six Song Sparrow males were based in bushes and yards around the plot, with occasional activities in the Corn. Two Killdeer males ranged widely over the Corn and other surrounding areas. Eastern Meadowlarks and Red-winged Blackbirds were associated with the Wheat. The Purple Martins were associated with one of two previously unused nest boxes immediately north of the census plot. The Brown Thrasher was found along bushes in the midst of Corn. Barn Swallows and Chimney Swifts were regular foragers over the plot during May, June, and July. In the housing development were 4 male Chipping Sparrows and numerous House Sparrows in addition to species already mentioned. The only bird use of the road was occasional visits by Horned Larks and one flock of 6 House Sparrows. — ROBERT W. GUTH, *Goshen College, Goshen, Ind. 46526.*

63. FOOTHILL GRASSLAND. — Location: California; on the Jasper Ridge Biological Experimental Area of Stanford University, San Mateo County, 3.5 miles west-southwest of the Main Quadrangle; 37°24'20"N, 122°13'30"W, NW/4 of Palo Alto Quadrangle, U.S.G.S. Size: 27 acres. Description of Area: See *American Birds* 25: 652-653 (1971). In the breeding season, the half with serpentine soil is almost completely covered with wildflowers, especially Branchy Goldfields (*Baeria chrysostoma*), Owl-clover (*Orthocarpus densiflorus*), California Poppy (*Eschscholtzia californica*), Field Tidy Tips (*Layia*