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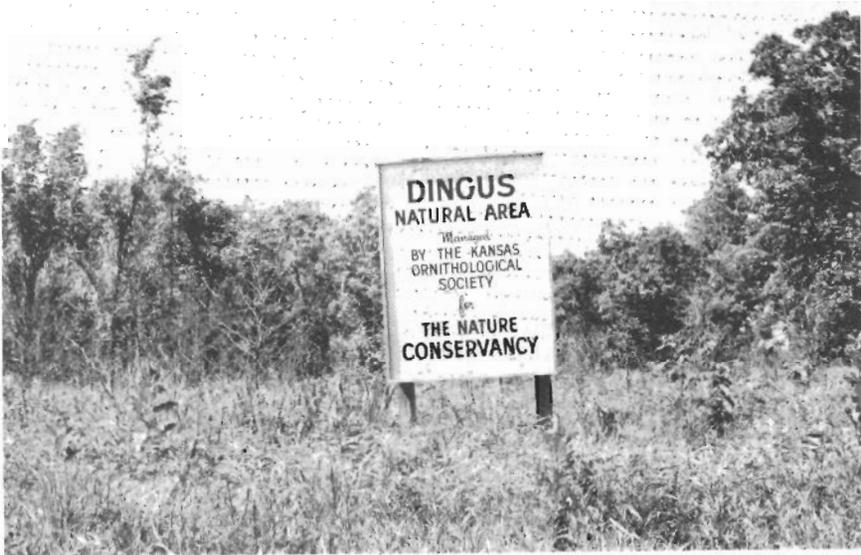


FIGURE 1. Entrance to Dingus Natural Area near Mound City, Linn County, Kansas. Photo by E. R. Lewis.

A HISTORY OF THE DINGUS NATURAL AREA

Eugene R. Lewis

When Jasper Dingus first rode by horseback into the newly opened Kansas Territory in early December of 1854 he found a land of lush prairies on many of the rolling hills just beyond the western border of Missouri. He also found Indians camped just north of what was to become Mound City and he stopped to eat with them. He must have liked what he saw of the land because early in 1855 he returned with an uncle and claimed a few hundred acres in the newly organized County of Linn. His land, as well as the land about him, consisted of the ever-present prairie with trees, for the most part, limited to the streams flowing in the area.

Probably Jasper Dingus was not aware that the land he possessed, as well as that all about him, had been undergoing a change for more than two decades. The westward advance of the white man had brought about a lessening of the fires that helped forestall the advance of trees into the prairies. But, the change had not been as great as that brought about by the next two decades as he settled on his land, eventually married, had children and grandchildren, built two homes (one for summer breezes, one for winter protection), and plowed some of the prairie for his crops.

One tract of land just to the east of his homestead was different from most. On much of it was a mature woods with its accompanying undergrowth of shrubs and

woodland wildflowers. Although he did not own it, he and his descendents watched with interest as most of the remaining tall grasses all but disappeared and trees continued to take possession.

In 1910 someone attempted to start an apple orchard on that tract on the north slope of one section called Fern Hill, aptly named because of the large number of ferns growing there. About the same time a small cabin was built nearby only to be eventually abandoned as was one built about 1916 or 1917. No evidence remains of the cabins or orchard and only local history reveals their former presence.

A road was constructed along the north side of the area but, after many years of use, living patterns changed and the road was largely abandoned. In the 1950's the area experienced two fires, one of which was purposely started by coon hunters. This latter fire burned much of the dead undergrowth and fallen trees, perhaps helping to rescue for a time a small patch of prairie grass lingering on a south slope.

In 1952, prompted by the desire to assure a permanent wooded area for Pileated Woodpeckers in the vicinity, Jasper Dingus' grandson, Wilson Dingus, and Wilson's wife Eunice, bought the first of four tracts that were to comprise the total area of 167 acres. The last 53 acres were purchased in 1963.

In 1973 Mr. and Mrs. Dingus deeded the Dingus Natural Area, as it was to be called, to The Nature Conservancy as a nature preserve and in May 1975 a five-year lease was signed between The Nature Conservancy and the Kansas Ornithological Society. That lease gave care of the Dingus Natural Area to the Kansas Ornithological Society to hold in its natural state and to serve as a scientific study area.

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VEGETATION AND FLORA OF THE DINGUS NATURAL AREA

Lloyd C. Hulbert and Robert W. Weese

Vegetation

The Dingus Natural Area is dominated by oak-hickory forest. On better sites some of the trees attain a diameter exceeding two feet. On the ridges where rocks outcrop at the surface the trees are much smaller and form rather open stands.

Prairie plants are present in three areas. One is along the road at the southeast corner. The other two are on the upper south-facing slopes just above the rock outcrops that form the tops of the steep slopes. Trees are gradually encroaching on these prairie patches. Most of the area has a forest cover with a continuous canopy. The herbaceous cover includes forest species like mayapple, trillium, solomon's seal, forest species of violets, and many others, testifying to the long time that trees have occupied much of the area.

Wilson Dingus reported that the area was mostly prairie when the land was first settled, according to his grandfather. This is substantiated by the records of the surveyor who laid out the sections and townships in Linn County in 1856. Study of these Land Office Survey records (in the Secretary of State's Office in the State Capitol, Topeka) indicate that about 20.1 per cent of the township containing the Dingus Natural Area (Township 22 south, Range 23 east) was forested in 1856, and 79.9 per cent was prairie. The surveyors were instructed to record construction materials, and so they recorded when they entered and left timber along the section and township lines. When available, trees were used as witnesses for the location of survey markers.

The survey records of 1856 indicate that the Dingus Natural Area itself was forested. Clearly it was not entirely forested, as the prairie remnants present today testify. The evidence is clear that forest has encroached on prairie throughout eastern Kansas since settlement where the land was not cleared, plowed, or regularly burned (Bragg and Hulbert, 1976). However, the Dingus Natural Area apparently was more than half forested at the time of the survey in 1856, the prairie areas being too small for the surveyor to bother mentioning. It

appears that the prairie areas were primarily not along the section boundaries and so may not have been noticed. The large trees on part of the area, the presence of forest herbs and the absence of prairie herbs support the idea that most of the Dingus Natural Area was in forest at the time of settlement.

There are some fine specimens of red oaks on the north-facing slopes where moisture is more plentiful than on south-facing slopes. A windstorm blew down or broke off a number of them in 1975 in the draw nearest the south end. The forest is best developed on the north-facing slope south of Little Sugar Creek. Here the forest species are most plentiful, and include many trilliums, some bloodroot, jackinthepulpits, isopyrum, Dutchman's breeches, several ferns, and many others. This slope is locally referred to as Fern Hill because of the numerous ferns present.

Partial List of Vascular Plants

The following list contains 185 species of ferns, conifers, and flowering plants, which is probably near two-thirds of the species occurring on the Dingus Natural Area. The woody plant list is very close to complete. It is based mostly on many years of careful observation by Robert Weese, who is such a good observer that he sees differences often listed as varieties or forms by plant systematists.

The herbaceous species list is based primarily on two collecting trips, April 10 and June 4 and 5, 1976, supplemented by observations made in earlier years by us. A number in parentheses refers to the collection number of a specimen collected on one of these trips and deposited in the Kansas State University herbarium, Manhattan. The fall flowering species are poorly represented in the list because no collections have been made at that time of year. They, plus scarce or rare species missed so far are likely to total 75 to 100 more species.

Common names are often unreliable for identification because several different plants are often referred to by the same name, and one species will often be called different names in different places. In this list the first common name is the recommended common name (Anderson and Owensby, 1969), given in an effort to standardize names as has been done with birds. In parentheses are given some other names often used, but there are many names used which are not given.

Scientific nomenclature is generally from Barkley (1968). For ferns and in a few other cases other references are followed, especially Steyermark (1963).

Annual herbs are indicated by one asterisk before the name, biennials by two asterisks. All species are believed to be native unless otherwise indicated.

Woody Plants

Aceraceae

Acer saccharinum L. silver maple. Only a few, near Little Sugar Creek.

Acer saccharum Marsh. sugar maple. Very abundant over the entire area except for the prairie openings. Some large trees in north end.

Anacardiaceae

Rhus aromatica Ait. var. *serotina* (Greene) Rehder, aromatic sumac (fragrant sumac). Several in more open areas, one found in full shade.

Rhus copallina L. flameleaf sumac (winged sumac). Found only in one open area on a hill.

Rhus glabra L. smooth sumac. Very few, in open areas.

Rhus radicans L. (*Toxicodendron radicans*, *Rhus toxicodendron*). poisonivy.

Occasional, mostly in shaded areas. Occurs both as a vine and a low shrub.

Annonaceae

Asimina triloba (L.) Dunal. pawpaw. Some found in the lowlands.

Aquifoliaceae

Ilex decidua Walt. holly (possum haw). Only one small plant, about 3 ft. tall, found in an opening.

Betulaceae

Ostrya virginiana (Mill.) K. Koch, American hophornbeam (ironwood). The most common undergrowth trees in most areas. A few are large for this species.

Caprifoliaceae

Sambucus canadensis L. American elderberry. Scarce, in moist soil in lowlands or seepage areas on slopes, where shade not great.

Symphoricarpos orbiculatus Moench, buckbrush (coralberry). Infrequent, mostly single plants, not patches.

Viburnum prunifolium L. var. *bushii* (Ashe) Palmer & Steyermark. blackhaw viburnum (nannyberry). Frequent both on upland and lowlands, in open and timbered areas.

Viburnum rufidulum Raf. rusty blackhaw viburnum. Frequent both on the hills and in lowlands (4528).

Celastraceae

Celastrus scandens L. American bittersweet (climbing bittersweet). Frequent.

Euonymus atropurpureus Jacq. eastern wahoo (burning bush). Scattered patches in more open areas. Small on upland, larger in lowlands (4614).

Cornaceae

Cornus drummondii Meyer (*C. asperifolia*), roughleaf dogwood. Common both in open and forested areas.

Ebenaceae

Diospyros virginiana L. common persimmon. A number occur in the south fourth of the area on upland (4635).

Fagaceae

Quercus alba L. white oak. A few nice trees, mostly on north-facing slopes and in the bottom.

Quercus borealis Michx. var. *maxima* (Marsh.) Ashe, northern red oak. A few scrubby trees on the hills, many very nice large trees on the three north-facing slopes.

Quercus macrocarpa Michx. bur oak. Very few present.

Quercus prinoides Willd. (including *Q. muehlenbergii*) chinquapin oak (chestnut oak). Very common in the mixed timber. Most are small.

Quercus shumardii Buckl. shumard oak. Frequent. No large trees.

Quercus stellata Wang. post oak. One of the most abundant trees on upland, very few on bottomland. Mostly small.

Quercus velutina Lam. black oak. A few on the upland of mostly small size.

Hippocastanaceae

Aesculus glabra Willd. var. *sargentii* Rehder (var. *arguta* (Buckl.) Robinson), western buckeye. Frequent in lower slopes and lowlands. Some specimens are close to the variety *glabra*, Ohio buckeye.

Juglandaceae

Carya cordiformis (Wang.) K. Koch, bitternut hickory. A few small ones on the ridges, and many nice tall straight ones on hillsides and bottoms.

Carya illinoensis (Wang.) K. Koch, pecan. One small tree found in heavy timber on a hill.

Carya ovata (Mill.) K. Koch, shagbark hickory. Some nice trees on hillsides and bottomland. Does better on good soil (4613.)

Carya tomentosa (Poir.) Nutt. mockernut hickory. A few found in mixed timber on hills.

Juglans nigra L. black walnut. Frequent. Poor growth on upland, some fine specimens on lowlands. Some cut for lumber on north end in recent years.

Leguminosae

Amorpha canescens Pursh. leadplant. Seen only in one prairie area on a south-facing slope where it was abundant.

Amorpha fruticosa L. indigobush amospha (false indigo). Only one seen, near a spring.

Cercus canadensis L. eastern redbud (Judastree). Thinly scattered throughout.

Gleditsia triacanthos L. common honeylocust. A few young ones found in open areas at south end.

Gymnocladus dioica (L.) K. Koch, Kentucky coffeetree. Scarce, mostly in more open forest. Commonly occurs in groups.

Liliaceae

Smilax hispida Muhl. (*S. tamnoides*), bristly greenbriar. Scattered over uplands. (4597).

Menispermaceae

Menispermum canadense L. common moonseed. Frequent in forested areas.

Moraceae

Maclura pomifera (Raf.) Schneid. osageorange (hedgeapple). A few found both on uplands and lowlands. (Naturalized from southern United States).

Morus rubra L. red mulberry. A few small widely scattered trees.

Oleaceae

Fraxinus americana L. white ash. Frequent on both uplands and lowlands.

Fraxinus pensylvanica Marsh. var. *subintegerrima* (Vahl.) Fern. green ash.

Frequent over entire area, mostly small.

Pinaceae

Juniperus virginiana L. redcedar (juniper). Frequent, mostly small.

Pinus nigra Arnold, Austrian pine. One tree planted in southeast corner beside the road (introduced from Europe).

Pinus sylvestris L. Scotch pine. One specimen planted in southeast corner beside the road (introduced from Europe).

Platanaceae

Platanus occidentalis L. sycamore. A few along creek. One burned out sycamore stump must be 5 or 6 feet in diameter.

Rhamnaceae

Ceanothus herbaceus Raf. (*C. ovatus*), inland ceanothus. Scarce on rocky slope below limestone outcrop in an open area (4587).

Rhamnus lanceolatus Pursh, lanceleaf buckthorn. Three seen on limestone outcrop area in rather open forest. (4630).

Rosaceae

Amelanchier arborea (Michx. f.) Fern. serviceberry (shadbush). One seen.

Crataegus crus-galli L. cockspur hawthorn. Few seen in open timber.

Crataegus sp., perhaps *C. mackenzii* Sarg. hawthorn. One seen (4618).

Crataegus sp., probably *C. mollis* (T. & G.) Scheele. downy hawthorn. Rare (4628).

Prunus hortulana Bailey, hortulan plum (wild goose plum). Three or four plants in one colony near south road (4642).

Prunus mahaleb L. mahaleb cherry. Three found.

Prunus munsoniana Wight & Hebr. wildgoose plum. One seen near south end (4634).

Prunus serotina Ehrh. black cherry. Only a few widely scattered specimens.

Rosa carolina L. carolina rose (pasture rose). Large patch in grassland at south end (4560).

Rosa setigera Michx. var. *tomentosa* T. & G. prairie rose (climbing rose). Few in patch by rock outcrop in open area (4605).

Rubus occidentalis L. blackcap raspberry. Several nice small patches in more open areas (4606).

Rubus ostryaefolius Rydb. highbush blackberry. Rare at edge of woods (4589).

Rutaceae

Ptelea trifoliata L. common hoptree (wafer ash). Scarce along rock outcrop (4608).

Zanthoxylum americanum Mill. common pricklyash. Frequent, both as single plants and in patches where less heavily shaded.

Salicaceae

Populus deltoides Marsh. eastern cottonwood. Only a few on bottomland at north end.

Salix nigra Marsh. black willow. Very few along creek and by spring.

Sapotaceae

Bumelia lanuginosa (Michx.) Pers. var. *albicans* Sarg. woollybucket bumelia (woolly buckthorn, chittimwood). Frequent in upland forest. One, on a south-facing slope, is 25 feet tall and about 6 inches in diameter, the largest Robert Weese has seen (4586).

Saxifragaceae

Ribes missouriense Nutt. Missouri gooseberry. A few plants found in forest.

Staphyleaceae

Staphylea trifolia L. American bladdernut. Frequent in lowland forest (4620).

Tiliaceae

Tilia americana L. American linden (basswood). Frequent, good growth on lowlands, especially near Little Sugar Creek.

Ulmaceae

Celtis occidentalis L. common hackberry. Frequent. A few large trees on lower slopes and in bottoms.

Celtis tenuifolia Nutt. small hackberry (upland hackberry). A few on the hills, small and scrubby.

Ulmus americana L. American elm. Frequent, but no large trees.

Ulmus rubra Muhl. (*U. fulva*), slippery elm. Very few small trees.

Vitaceae

Ampelopsis cordata Michx. heartleaf falsegrape. Two seen on bottomland.

Parthenocissus quinquefolia (L.) Planch. Virginia creeper (woodbine). Frequent in forested areas.

Vitis vulpina L. (*V. cordifolia*). wild grape (winter, frost, or chicken grape).

Scarce (4627).

Herbaceous Plants

Acanthaceae

Ruellia strepens L. limestone ruellia. Scarce in open forest (4564).

Apocynaceae

Apocynum sibiricum Jacq. prairie dogbane. Found in grassland at south end.

Araceae

Arisaema dracontium (L.) Schott, dragonroot jackinthepulpit (green dragon). Scarce in lowland forest (4569).

Arisaema triphyllum (L.) Schott, indian jackinthepulpit. Frequent in lowland forest (4570).

Asclepiadaceae

Asclepias purpurascens L. purple milkweed. Scarce in open areas (4611, 4556).

Asclepias tuberosa L. butterfly milkweed. Scarce in open area by limestone breaks (4612).

Asclepias verticillata L. whorled milkweed. Few seen in prairie openings.

Balsaminaceae

**Impatiens capensis* Moerb. spotted snapweed (jewelweed, touch-me-not). Frequent in bottomland forest (4571).

Berberidaceae

Podophyllum peltatum L. common mayapple (wild jalap). Frequent to common throughout the forest, but mostly on deep soils (4563, 4534).

Boraginaceae

Lithospermum canescens (Michx.) Lehm. hoary gromwell (puccoon). Two seen in grassland on ridge in rocky soil (4530).

Campanulaceae

**Triodanis perfoliata* (L.) Nieuwl (*Specularia p.*), clasping venuslookingglass. Rare or scarce in grassland and open forest (4596, 4633).

Compositae

**Ambrosia artemisiifolia* L. common ragweed. Scarce in grassland at south end.

Artemisia plantaginifolia (L.) Richards. var. *ambigens* (Greene) Cronq. (*A. fallax*) plantainleaf pussytoes (indian tobacco). Few patches on rocky soil in forest (4524).

Artemisia ludoviciana Nutt. Louisiana sagewort (wild sage, mugwort). Infrequent in grassland at south end.

Aster simplex Willd. paniced aster. In dense patches in grassland at south end (4557).

Cacalia atriplicifolia L. (*C. plantaginea*) pale indianplantain. Rare in upland forest (4638).

Echinacea pallida Nutt. var. *angustifolia* (DC.) Cronq. blacksampon echinacea (purple coneflower). Scarce in one prairie opening on shallow soil.

**Erigeron annuus* (L.) Pers. annual fleabane (daisy fleabane). Scattered patches in open spots of grassland at south end (4554).

Helianthus laetiflorus Pers. (*H. rigidus*) stiff sunflower. Patches in grassland at south end (4558).

***Lactuca floridana* (L.) Goertz. Florida lettuce (wild lettuce). Scattered in lowland, rarely on upland (4629).

Liatris punctata Hook. dotted gayfeather (blazing star). Scarce in grassland areas.

Prenanthes aspera Michx. rough rattlesnakeroot. Scarce.

Senecio obovatus Muhl. ex. Willd. roundleaf groundsel (ragwort). Scattered in rocky soil in open forest (4527).

Solidago canadensis L. Canada goldenrod. Patches in grassland at south end (4559).

***Tragopogon dubius* Scop. (*T. major*) western salsify (goat's beard). Scarce in grassland at south end.

Verbesina alternifolia (L.) Britt. (*Actinomeris a.*) wingstem. Patch in open in bottomland (4599).

Verbesina virginica L. white crownbeard. Rare near top of slope in open forest (4619).

Vernonia baldwini Torr. var. *interior* (Small) Shubert, inland ironweed. Scarce in grassland at south end.

Commelinaceae

Tradescantia ohiensis Raf. spiderwort. Twenty to thirty plants in prairie opening on south-facing slope (4583).

Cruciferae

***Arabis canadensis* L. sickle pod. Very scarce in lowland forest (4616).

Dentaria laciniata Muhl. cutleaf toothwort. Scarce to frequent, mostly on lowlands and lower slopes in forest (4532).

Cyperaceae

Carex laxiflora Lam. sedge. Scarce in upland forest (4637).

Carex muhlenbergia Schk. sedge. Scattered, infrequent (4636).

Carex nigro-marginata Schw. (including *C. arctitecta* Mack.), sedge. A number of widely spaced plants on upland in forest (4525).

Fumariaceae

***Corydalis flavula* (Raf.) DC. pale corydalis. Rare (4538).

Dicentra cucullaria (L.) Bernh. dutchman's-breeches. Frequent, especially in lower slopes and lowland forest (4519).

Geraniaceae

Geranium carolinianum L. Carolina geranium. Scarce in grassland at south end.

Gramineae

Andropogon gerardi Vitman, big bluestem. Few patches on south-facing slopes and in southeast corner.

Andropogon scoparius Michx. little bluestem. Scattered in few patches on south-facing slopes and in southeast corner.

**Bromus japonicus* Thunb. Japanese brome (Japanese chess). Scarce in grassland at south end.

Bromus purgans L. Canada brome (Hairy woodchess). Scarce on shallow soil in upland forest (4555).

Festuca obtusa Biehler, nodding fescue. Scarce in moist soil on ridge in forest (4568).

Panicum lanuginosum Ell. var. *fasciculatum* (Torr.) Fern. panicum. Scarce in edge of forest on shallow soil (4553).

Panicum virgatum L. switchgrass. A few plants seen in grassland at south end.

Sorghastrum nutans (L.) Nash. indiagrass. Scattered in few small spots on south-facing slopes and at south end.

Sporobolus asper (Michx.) Kunth, tall dropseed. Patch in disturbed soil at south end.

Tripsacum dactyloides (L.) L. eastern gamagrass. One clump seen in southeast corner.

Uniola latifolia Michx. broadleaf uniola (spikegrass). Scarce.

Hydrophyllaceae

Hydrophyllum virginianum L. Virginia waterleaf. Several in forested lowland (4615).

Hypericaceae

Hypericum sphaerocarpum Michx. roundfruit St. Johnswort. Patch in edge of woods near south end (4592).

Leguminosae

Astragalus canadensis L. Canada milkvetch (rattleweed). Few on steep, rocky, south-facing slope in open forest (4602).

Baptisia australis (L.) R. Br. var. *minor* (Lehm.) Fern. blue wildindigo (false indigo). Scarce in prairie openings.

**Cassia fasciculata* Greene, showy partridgepea. In disturbed spots near road at south end.

Desmanthus illinoensis (Michx.) MacM. Illinois bundleflower (prairie mimosa). Scarce in prairie opening.

Desmodium glutinosum (Muhl.) Wood, largeflower tickclover (beggar's ticks, beggar's lice). Frequent on lower and upper slopes in forest (4576).

Lespedeza capitata Michx. roundhead lespedeza. Few seen in prairie openings.

Lespedeza virginica (L.) Britt. slender lespedeza (bush clover). Scarce; one patch seen by limestone breaks in open (4609).

Lespedeza violaceae (L.) Pers. violet lespedeza (bush clover). Frequent in prairie opening on upper south-facing slope (4581).

***Melilotus alba* Desr. white sweetclover. Found only in the open areas. (Naturalized from Europe).

***Melilotus officinalis* (L.) Lam. yellow sweetclover. A few seen in grassland area by south road. (Naturalized from Europe).

Psoralea floribunda Nutt. manyflower scurfpea. Scarce in prairie openings (4580).

Schrankia uncinata Willd. catclaw sensitivebriar. A few seen in prairie openings on rocky soil.

Liliaceae

Allium canadense L. wild onion (wild garlic). Rare clumps seen in lower forested slope (4574).

Camassia scillioides (Raf.) Cory, Atlantic camas (blue camas, wild hyacinth). Rare in moist, rocky soil (4626).

Erythronium albidum Nutt. var. *albidum*, white fawnlily (white adder's tongue, white dogtooth violet). Frequent on north-facing slopes and in lowland forest (4529).

Lilium michiganense Farwell. Michigan lily (Turk's-cap lily). Scarce in lower forested area (4575).

Nothoscordum bivalve (L.) Britt. yellow falsegarlic. Scattered, some locally frequent on south-facing slopes and rocky areas (4539).

Polygonatum biflorum (Walt.) Ell. (including *P. canaliculatum*). solomonseal. Scarce in forest on deep soil south of Little Sugar Creek (4625).

Smilacina racemosa (L.) Desf. feather solomonplume (false solomon's seal). Scarce on lowland in forest (4588).

Smilacina stellata (L.) Desf. starry solomonplume (false solomon's seal). Scarce in forest on deep soil (4542).

Smilax herbacea L. var. *lasioneura* (Hook.) DC. greenbriar (carrionflower). Scarce in grassland at edge of forest (4594).

Trillium sessile L. trillium (wake-robin). Frequent on lowland soils south of Little Sugar Creek (4521).

Malvaceae

Callirhoe alcaeoides (Michx.) Gray, pale poppymallow. Scarce in grassland at south end.

Orchidaceae

Corallorhiza wisteriana Conrad, coralroot. One seen in middle of north-facing slope of "Fern Hill" (4623). (parasitic plant).

Onagraceae

Oenothera speciosa Nutt. white eveningprimrose. Ten to fifteen plants seen in prairie opening on upper south-facing slope (4582).

Ophioglossaceae

Botrychium virginianum (L.) Sw. var. *virginianum*, rattlesnake fern (grape

- fern). Frequent in forest, particularly on north-facing slopes (4640).
- Ophioglossum engelmanni* Prantl. adderstongue fern. Rare in forest on moist, rocky soil.
- Oxalidaceae**
- Oxalis stricta* L. (*O. dillenii* Jacq.) common yellow oxalis. Rare in open forest (4578).
- Papaveraceae**
- Sanguinaria canadensis* L. bloodroot. Few scattered patches (4538).
- Phytolaccaceae**
- Phytolacca americana* L. common pokeberry (pokeweed). One plant found on bottomland.
- Polemoniaceae**
- Phlox divaricata* L. sweetwilliam phlox (woodland or blue phlox). Scarce in lowland forest (4518).
- Polygonaceae**
- Polygonum virginianum* L. (*Tovare* v.) Virginia tovara (jumpseed). Scattered in gravel of stream bed in south drainage (4572).
- Polypodiaceae**
- Adiantum pedatum* L. American maidenhair fern. Scarce on north-facing slope south of Little Sugar Creek ("Fern Hill") (4621).
- Cheilanthes feei* Moore. lip-fern. One plant found in crevice on side of limestone outcrop.
- Cystopteris fragilis* (L.) Bernh. var. *protrusa* Weath. brittle bladderfern. Frequent in lowland forest (4590).
- Pellaea atropurpurea* (L.) Link. purple cliffbrake. One colony on boulder on crest of north-facing slope north of road in forest (4639).
- Pellaea glabella* Mett. ex. Kuhn. smooth cliffbrake. Few dozen plants on limestone outcrop at top of south-facing slope (4579).
- Woodsia obtusa* (Spreng.) Torr. common woodsia. Several large patches (4533).
- Portulacaceae**
- Claytonia virginica* L. Virginia springbeauty. Frequent in forest on lowlands (4531).
- Ranunculaceae**
- Anemone virginiana* L. Virginia anemone. Scarce in upland forest (4593).
- Delphinium virescens* Nutt. plains larkspur. Scarce in prairie openings (4610).
- Isopyrum biternatum* (Raf.) T. & G. Atlantic isopyrum (false rue anemone). Frequent in forest (4520).
- Thalictrum dasycarpum* Fisch. & Ave-Lall var. *dasycarpum*, purple meadowrue. One seen on floodplain of small stream in south draw (4573).
- Thalictrum dasycarpum* Fisch. & Ave-Lall var. *hypoglaucum* (Rydb.) Boivin. Scarce on shallow soil in forest (4546).
- Rosaceae**
- Agrimonia pubescens* Wallr. downy agrimony. On steep, rocky, south-facing slope in open forest (4603).
- Geum canadense* Jacq. white avens. Scarce in forest.
- Rubiaceae**
- **Galium aparine* L. catchweed bedstraw (cleavers). Large patch in bottomland forest (4598).
- Galium circaezans* Michx. var. *hypomalacum* Fern. bedstraw (wild licorice). Frequent in forest, especially on shallow soil (4561).
- Galium concinnum* T. & G. shining bedstraw. Frequent in lowland forest; scarce in upland forest (4543, 4565).
- Scrophulariaceae**
- Penstemon digitalis* (Sweet) Nutt. smooth penstemon (beard tongue). Scarce on shallow soil in open forest (4566).
- Umbelliferae**
- Cryptotaenia canadensis* (L.) DC. honeywort (honestwort). One patch seen on north-facing slope in deep soil in shade of forest (4600).
- ***Sanicula canadensis* L. Canada sanicle (snakeroot). Scarce in upland forest (4562).

Taenidia integerrima (L.) Drude, yellow taenidia (yellow pimpernel). Scattered on rocky south-facing slopes in areas where tree canopies are not continuous (4577).

Thaspium barbinode (Michx.) Nutt. hairyjoint thaspium (meadow parsnip). Scarce on shallow soil in upland open forest (4567, 4584).

Zizia aurea (L.) Koch, golden zizia (golden alexanders, meadow parsnip). Rare in upland open woods (4591).

Urticaceae

**Parietaria pensylvanica* Muhl. ex. Willd. pellitory. Rare on hillside in open spot (4631).

**Pilea pumila* (L.) Gray, clearweed (richweed). Rare, in moist soil by stream (4601).

Verbenaceae

Verbena canadensis (L.) Britt. rose verbena. Scarce in open areas with rocky soil (4526).

Violaceae

Viola eriocarpa Schw. (*V. pensylvanica* Michx.), woolpod violet (smooth yellow violet). Scarce, mostly in lowlands (4522).

**Viola rafinesquii* Greene (*V. kitaibeliana*) johnnyjumpup (wild pansy). Scattered in one patch in grassland at south end. (Naturalized from Eurasia).

Viola soraria Willd. sister violet (hairy blue violet, woolly blue violet). Scarce, mostly on lowlands (4535).

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BIRDS OF THE DINGUS NATURAL AREA

Eunice Dingus

The only permanent water on the Natural Area is furnished by Little Sugar Creek which forms part of the North boundary. It is here that the Belted Kingfisher, Louisiana Waterthrush and Wood Duck have nested. Not all birds listed as summer or permanent residents are necessarily found in the Natural Area at all times. Some of the birds may use the Area only for occasional feeding, hunting or resting.

Permanent Residents

Cooper's Hawk
Red-tailed Hawk
American Kestrel
Bobwhite
Mourning Dove
Barn Owl
Screech Owl
Great Horned Owl
Barred Owl
Pileated Woodpecker

Red-bellied Woodpecker
Red-headed Woodpecker
Hairy Woodpecker
Downy Woodpecker
Blue Jay
Common Crow
Black-capped Chickadee
Tufted Titmouse
White-breasted Nuthatch

Carolina Wren
Northern Mockingbird
American Robin
Eastern Bluebird
Loggerhead Shrike
Starling
House Sparrow
Eastern Meadowlark
Cardinal
American Goldfinch

Migrants

Blue-winged Teal
Northern Shoveler
Black-billed Cuckoo
Empidonax flycatchers
(unidentified)
Olive-sided Flycatcher
Hermit Thrush
Swainson's Thrush
Gray-cheeked Thrush
Golden-crowned Kinglet
Ruby-crowned Kinglet

Cedar Waxwing
Philadelphia Vireo
Warbling Vireo
Black-and-white Warbler
Worm-eating Warbler
Blue-winged Warbler
Tennessee Warbler
Orange-crowned Warbler
Nashville Warbler
Yellow-rumped (Myrtle)
Warbler

Black-throated Green
Warbler
Blackpoll Warbler
Wilson's Warbler
Canada Warbler
American Redstart
Rose-breasted Grosbeak
Vesper Sparrow
Chipping Sparrow
Clay-colored Sparrow
White-throated Sparrow
Lincoln's Sparrow

Summer Residents

Great Blue Heron
Green Heron
Wood Duck
Turkey Vulture
Killdeer
Spotted Sandpiper
Yellow-billed Cuckoo
Chuck-will's-widow
Whip-poor-will
Common Nighthawk
Chimney Swift
Ruby-throated Hum-
mingbird
Belted Kingfisher
Eastern Kingbird
Great Crested Flycatcher

Eastern Phoebe
Eastern Wood Pewee
Rough-winged Swallow
Barn Swallow
Purple Martin
House Wren
Bewick's Wren
Gray Catbird
Brown Thrasher
Wood Thrush
Blue-gray Gnatcatcher
White-eyed Vireo
Bell's Vireo
Red-eyed Vireo
Northern Parula Warbler

Louisiana Waterthrush
Kentucky Warbler
Common Yellowthroat
Yellow-breasted Chat
Red-winged Blackbird
Orchard Oriole
Northern (Baltimore)
Oriole
Common Grackle
Brown-headed Cowbird
Summer Tanager
Blue Grosbeak
Indigo Bunting
Dickcissel
Lark Sparrow
Field Sparrow

Winter Visitors

Sharp-shinned Hawk
Golden Eagle (Rare)
Common (Yellow-shafted)
Flicker
Common (Red-shafted)
Flicker
Yellow-bellied Sapsucker
Red-breasted Nuthatch

Brown Creeper
Winter Wren
Rusty Blackbird
Brewer's Blackbird
Purple Finch
Rufous-sided Towhee
Dark-eyed (Slate-colored)
Junco

Tree Sparrow
Harris' Sparrow
White-crowned Sparrow
Fox Sparrow
Song Sparrow
Chestnut-collared Longspur
(rare)

14034 W. 90th Terrace, Apt. 4, Lenexa, Kansas 66215.

BOOK REVIEW

The Web of Adaptation. Bird studies in the American tropics. David W. Snow. 1976. Quadrangle—The New York Times Book Co. (10 East 53rd St., N.Y., N.Y. 10022). 176 pp. + 15 black-and-white drawings. Hard cover. \$8.95.

This fine book has something for both laymen and professionals. Its subject matter (behavior and life histories of tropical birds) will be new to many readers but the highly readable style and the habits of the birds discussed will excite your interest. It is based largely on the personal field experiences of Dr. and Mrs. Snow while he was Resident Naturalist at the New York Zoological Society's Tropical Research Station on Trinidad.

Much of the book is devoted to the elaborate courtship behavior of manakins and cotingas—courtships which rival those of the more familiar birds-of-paradise. The author describes these often bizarre habits and then speculates on their origins,

relating them to the stable environment and the birds' fruit-eating habits. Utilization of a highly nutritious and constantly available food supply allows the female sufficient time to attend nesting duties alone while the male devotes nearly all of his time to competitive display. Dr. Snow's speculations are clearly presented, backed by field observations and are usually convincing. Other chapters deal with such topics as the possible reasons for smaller clutch size in tropical birds (including some new ideas), the evolution of a fruit-eating nightjar (oilbird), and the coevolution of frugivorous birds and fruiting trees. Another chapter draws the web together by discussing the inter-relationships among feeding habits, social behavior, nesting, anatomy, plumage and longevity.

I find the book a fascinating blend of the author's personal experiences, field observations and theory. Anyone planning to visit the tropics should read this book; others will find much of interest, and many will view our local birds with new interest and understanding. *Charles A. Ely, FHKSC, Hays, Kansas 67601.*

CORRECTIONS

Two serious errors appeared in the June issue (Vol. 27, No. 2). On page 16, par. 1, line 6 should read . . . none of the nests survived. The Figure numbers and legends of Figures 2 and 3 should be reversed. The Figure on page 19 is therefore correctly—Figure 3. Seasonal distribution . . . etc. The Figure on page 21 is correctly—Figure 2. Relative abundance . . . etc.

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