

Proceedings of the Iowa Academy of Science

Volume 63 | Annual Issue

Article 10

1956

The Flora of Emmet County, Iowa

B. O. Wolden

Copyright © Copyright 1956 by the Iowa Academy of Science, Inc.

Follow this and additional works at: <https://scholarworks.uni.edu/pias>

Recommended Citation

Wolden, B. O. (1956) "The Flora of Emmet County, Iowa," *Proceedings of the Iowa Academy of Science*: Vol. 63: No. 1 , Article 10.

Available at: <https://scholarworks.uni.edu/pias/vol63/iss1/10>

This Research is brought to you for free and open access by UNI ScholarWorks. It has been accepted for inclusion in Proceedings of the Iowa Academy of Science by an authorized editor of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

The Flora of Emmet County, Iowa¹

By B. O. WOLDEN

INTRODUCTION

The original paper with this title, prepared in the late 1920's, was submitted for publication in 1932, and appeared in Volume 39 of the Proceedings of the Iowa Academy of Science. In the introduction to that list there was a brief description of the topography and of the natural areas of the county. It has not been considered necessary to repeat such description in this paper except to indicate some of the changes that have taken place since that time and which have affected the flora. The greatest changes, consisting of bringing the prairie under cultivation, draining most of the marshes and prairie ponds, and clearing and pasturing many woodlands, had most of them come by the close of the previous century, or shortly thereafter.

During the more recent years more of the few spots that had remained of the upland prairie have disappeared. Modern construction of country roads have destroyed most of the prairie roadsides. Spraying the roadsides is killing not so much the coarse weeds as it does such native prairie plants as have survived or returned after road construction. If this continues the only native plants remaining along the roads will be species of Gramineae and Cyperaceae. The wet roadside ditches do serve as places of refuge for many species of these families. The wide shallow ditches along Highway 17 northward from Estherville, from where the top soil was removed in construction, seem to offer favorable conditions for plants which prefer a calcareous soil. Among such are species of *Juncus*, *Eleocharis*, and *Carex*. During recent springs patches of blooming *Carex meadii* and of the unusual *Carex tetanica* have been conspicuous along this highway. For a stretch of about two miles *Spiranthes cernua*, almost extinct elsewhere in the county, blooms in profusion in September. The railroad right-of-way along Highway 17, north and south across the county, and that along Highway 9 west of Estherville, have so far provided refuge for many prairie plants which have become rare or extinct in other situations.

Many old gravel pit bottoms have an interesting flora. In some there are more or less permanent pools of water where many marsh and aquatic plants have become established. A few wooded areas which at one time were pastured have been permitted to return to wildwood conditions. Other woods have been demolished by the use of modern power machinery, as was the case with the splendid

¹Revised according to Gray's Manual, Eighth Edition.

woods at the east end of Swan Lake.

Along the flood plain of the west branch of the Des Moines River, in the northern part of Estherville and northward for some distance, are found bottomland jungles where once there was closely pastured bluegrass sod. This land consists of small acreages bordering on the river, and keeping cows on such acreages has been mostly discontinued. Because of almost yearly flooding for some years, this land became covered with bottomland vegetation consisting of willows and other tall growth. Prominent among such vegetation we find *Rorippa amphibia* and in spots also *Rorippa prostrata*. Some of the larger and more conspicuous species of *Carex* such as *Carex sychnocephala*, *Carex retrorsa*, and *Carex comosa* are common.

In recent years work was begun to drain and dry some of the interesting fens along the Des Moines River. The largest and finest of these, located in section 21 in Emmet Township, has been drained and the interesting flora, consisting of bog plants found only in such situations, has been destroyed. Several woodland species have also become extinct in the county.

Because the flora of Emmet County had received much attention from other botanists during the years when there were still large areas in their natural condition, some of it long before the author began his study, consideration must be given to such work. Most of it was done by R. I. Cratty who in 1877 came to the vicinity of what later became the town of Armstrong at a time when, according to his own statement, nine-tenths of that part of the county was native prairie and marsh. As he studied the native flora he became particularly interested in the aquatic vegetation which was so abundant in the marshes and ponds of the undrained prairie. Much of his collected material was from those early years.

Cratty's "Flora of Emmet County" was published in 1904 and a list of additions in the following year. Cratty had led a busy life as school teacher and farmer and most of his collecting had been done in the eastern part of the county. When the author of this paper began his county-wide study the natural areas of marsh, peat bog, and prairie were mostly gone from that part. The author has therefore freely referred to Cratty's flora throughout this paper in order to present a true picture of the original plant life for the whole county. Many of the species of *Potamogeton* recorded by Cratty can no longer be found in the county. His collection of Emmet County plants was taken to Iowa State College when in 1918 he went there to become curator of the herbarium.

Others who collected in the county during the 1890's and later were T. J. Fitzpatrick, B. Shimek, and L. H. Pammel. Their pub-

lished works contain many references to Emmet County plants.

In the following list the author mentions briefly several unnamed forms found locally. As a beginner in the study of the local plant life he found such forms puzzling and confusing. Attention is called to some of these for the benefit of alert future students who will surely encounter them.

Through the years many puzzling specimens have been submitted to various specialists for determination, and credit was given to such in the early list. Those consulted since then have been given credit in the text and to all such a hearty appreciation is hereby expressed. Thanks are also due to Dr. H. S. Conard and to Dr. R. T. Thorne for encouraging the preparation of this paper.

EQUISETACEAE

- Equisetum arvense* L. Field-Horsetail. Springy places in woods, along shoulders of gravel roads, and along railway embankments. Forms observed include forma *ramulosum* (Rupr.) Klinge; forma *pseudosilvaticum* (Milde) Luerss.
- Equisetum arvense* var. *boreale* (Bong.) Ledeb. Similar situations.
- Equisetum fluviatile* L. Water-Horsetail. Shallow water; old gravel pit south part of Estherville.
- Equisetum kansanum* Schaffn. Sandy or gravelly ground; railway embankments.
- Equisetum hyemale* L. var. *intermedium* A. A. Eat. Prairie Scouring-rush. Gravelly prairies; railway embankments.
- Equisetum hyemale* L. var. *affine* (Engelm.) A. A. Eat. Common Scouring-rush. Gravelly and springy banks and prairie.
- Equisetum hyemale* L. var. *robustum* (A. Br.) A. A. Eat. Stout Scouring-rush. Gravelly and springy banks. Abundant in old gravel pit bottom in south part of Estherville.

OPHIOGLOSSACEAE

- Botrychium virginianum* (L.) Sw. Rattlesnake-Fern. Woods; High Lake and Estherville.

OSMUNDACEAE

- Osmunda claytoniana* L. Interrupted Fern. A colony near the top of a deep ravine in woods south of Estherville was destroyed in 1931.

POLIPODIACEAE

- Cystopteris fragilis* (L.) Bernh. Fragile Fern. Wooded hillsides and banks; Estherville and High Lake.
- Pteris pensylvanica* (Willd.) Fern. Ostrich-Fern. Once locally abundant in bottomland woods south of Estherville. A few persist in ravines. Armstrong Grove (Cratty).
- Onoclea sensibilis* L. Sensitive Fern. Once local in low woods. Stations at High Lake and Estherville destroyed. Armstrong Grove (Cratty).
- Dryopteris spinulosa* (O. F. Muell.) Watt. var. *intermedia* (Muhl.) Underw. Once found in High Lake woods but station destroyed.
- Athyrium felix-femina* (L.) Roth. var. *michauxii* (Spreng.) Farw. Lady-Fern. Our most common fern, found in woods throughout. Now rare except in Estherville woods.
- Adiantum pedatum* L. Maidenhair Fern. Still common along slopes of ravines at Estherville. Extinct at High Lake.

PINACEAE

- Juniperus virginiana* L. var. *crebra* Fern. and Grisc. Red Cedar. Once growing sparsely on high banks of High, Ingham, Swan, and Iowa lakes. Recent seedlings occur frequently in open woods and on hillsides.

TYPHACEAE

- Typha latifolia* L. Cat-tail Flag. Common in marshy places. Forma *ambigua* (Sonder) Kronf. Lower part of separated staminate spike often pistillate. Roadside ditch, sect. 6, Ellsworth.
- Typha angustifolia* L. Narrow-leaved Cat-tail. Not observed in early years, but has since appeared in marshes and in roadside ditches.
- Typha glauca* Godr. (*Typha angustifolia* var. *elongata* (Dudl.) Wieg.) This much taller species or variety is found in colonies with the preceding. The pistillate half of spike often shorter than described.

SPARGANIACEAE

- Sparganium eurycarpum* Engelm. Bur-reed. Locally abundant in marshes.
- Sparganium chlorocarpum* Rydb. Recorded by Cratty from marshes near Armstrong.

ZOSTERACEAE

- Potamogeton pectinatus* L. Fennel-leaved Pondweed. Common in lakes.
- Potamogeton zosteriformis* Fern. Eel-grass Pondweed. Cheever and Twelvemile lakes. Iowa Lake (Cratty).
- Potamogeton foliosus* Raf. Leafy Pondweed. Des Moines River. (Cratty).
- Potamogeton foliosus* var. *macellus* Fern. In lakes. (Cratty).
- Potamogeton friesii* Rupr. High and Ingham lakes. Iowa Lake (Cratty).
- Potamogeton pusillus* L. var. *minor* (Piv.) Fern. & Schub. High and Ingham lakes.
- Potamogeton amplifolius* Tuck. Large-leaved Pondweed. West fork of Des Moines River (Cratty).
- Potamogeton nodosus* Poir. (Cratty).
- Potamogeton gramineus* L. (Cratty).
- Potamogeton illinoensis* Morong. Collected by Cratty in lake east of Armstrong.
- Potamogeton natans* L. Floating Pondweed. Abundant in Cheever Lake. Formerly in High Lake ponds.
- Potamogeton praelongus* Wulfen. Iowa Lake (Cratty).
- Potamogeton richardsonii* (Ar. Benn.) Rydb. Clasping-leaved Pondweed. Common in most waters.
- Zannichellia palustris* L. Horned Pondweed. Once abundant in a prairie brook in sect. 21, Emmet Tp. Also in shallow water along sandy shores.

NAJADACEAE

- Najas flexilis* (Willd.) Rostk. & Schmidt. Slender Naiad. Shallow water along sandy shores; High and Cheever lakes.
- Najas guadalupensis* (Spreng.) Magnus. Shallow water; High Lake; Wallingford gravel pit.

JUNCAGINACEAE

- Triglochin maritima* L. Seaside Arrow-grass. Common in fens in Emmet Tp.
- Triglochin palustris* L. Marsh Arrow-grass. In fens in Emmet Tp. Common only in large fen sect. 21, north of Emmet bridge.
- Scheuchzeria palustris* L. var. *americana* Fern. Cratty collected this in a bog three miles northwest of Armstrong in early years.

ALISMATACEAE

- Alisma subcordatum* Raf. Water Plantain. Common along shores of ponds and sloughs and in roadside ditches.
- Lophocarpus calycinus* (Engelm.) J. G. Small. In shallow ponds, becoming abundant on mud flats in dry years.
- Sagittaria rigida* Pursh, forma *elliptica* (Engelm.) Fern. Arrowhead. In shallow water along the east shore of Cheever Lake.
- Sagittaria cristata* Engelm. Cratty collected the type of this species in 1881, in a small lake east of Armstrong. Lake was later drained.
- Sagittaria brevirostra* Mackenz. & Bush. Common in sloughs and along muddy margins of the west branch of Des Moines River.
- Sagittaria latifolia* Willd. Arrowhead, Duck-potato. Common in shallow water of ponds and sloughs.

Sagittaria latifolia var. *obtusa* (Muhl.) Weig. (*S. esculenta* Howell). This is strikingly different from typical *latifolia*. In sloughs adjoining Cheever Lake on the east.

Sagittaria cuneata Sheldon. Arrowhead, Wapato, Edges of ponds, marshes and bayous of rivers.

HYDROCHARITACEAE

Elodea canadensis Michx. Waterweed. In shallow water in lakes. Abundant in Cheever Lake.

Vallisneria americana Michx. Eelgrass. In lakes; High Lake.

GRAMINEAE

Bromus latiglumis (Shear.) Hitchc. Wild Brome-Grass. Frequent in woods, where occurs also forma *incanus* (Shear.) Fern.

Bromus purgans L. Another native wood species.

Bromus inermis Leyss. Hungarian Brome-Grass. Cultivated, and naturalized along roadsides.

Bromus secalinus L. Chess. Cheat. Introduced along railway embankments and roadsides.

Bromus tectorum L. Downy Brome-Grass. First appeared along railways and has since spread to sandy and gravelly soil.

Festuca ovina L. var. *duriuscula* (L.) W. D. J. Koch. Sheep's Fescue. Introduced in lawns and grassy places.

Festuca elatior L. Meadow-Fescue. Introduced near lawns and yards.

Festuca obtusa Biehler. Nodding Fescue-Grass. Common in woods.

Vulpia octoflora (Walt.) Rydb. var. *tenella* (Willd.) Fern. Very abundant in old Rock Island gravel pit, sect. 32, High Lake.

Glyceria borealis (Nash) Batchelder. Manna-Grass. At outlet of Four-mile Lake. Armstrong (Cratty).

Glyceria striata (Lam.) Hitchc. Fowl-meadow Grass. In wet places; shaded, springy ground.

Glyceria grandis S. Wats. Reed-meadow Grass. In swamps and margins of ponds.

Scholochloa festucacea (Willd.) Link. Sprangle-top. Around the edges of marshes, sometimes in shallow water.

Poa annua L. Low Speargrass. An introduced weed in shaded moist lawns and yards.

Poa compressa L. Canada Bluegrass. Very commonly naturalized in open woods and pastures.

Poa pratensis L. Kentucky Bluegrass. Common in all grassy places, open woods and prairie.

Poa sylvestris Gray. In woods and along shady banks.

Poa palustris L. Fowl-meadow Grass. Wet woods and meadows.

Dactylis glomerata L. Orchard-Grass. An introduced grass in orchards and other shaded ground.

Eragrostis hypnoides (Lam.) BSP. Creeping Love Grass. Abundant along low river banks.

Eragrostis megastachya (Koel.) Link. A common introduced weed in gardens and waste ground.

Eragrostis neomexicana Vasey. Abundant along shoulders of gravelled roads.

Eragrostis pectinacea (Michx.) Nees. In sand at Tuttle Lake.

Eragrostis frankii C. A. Mey. In sand and along roadsides.

Phragmites communis Trin. var. *berlandieri* (Fourn.) Fern. Reed. In water along margins of ponds and marshes, and also persists along wet roadsides.

Agropyron trachycaulum (Link) Malte. Slender Wheat-Grass. Open woods, banks and prairies.

Agropyron trachycaulum var. *glaucum* (Pease & Moore) Malte. On dry prairie; High Lake and Estherville.

Agropyron trachycaulum var. *unilaterale* (Cassidy) Malte. Rare. Dry prairie, Emmet.

Agropyron smithii Rydb. Western Wheat-Grass. In dry soil; prairie.

- Agropyron repens* Beauv. Quack-Grass. Abundant in vacant lots in towns and along railway embankments. Forms include forma *aristatum* (Schum.) Holb.
- Agropyron repens* var. *subulatum* (Schreb.) Reichenb. forma *vallantianum* (Wulf. & Schreb.) Fern. Along the Des Moines River north of Estherville.
- Lolium multiflorum* Lam. Italian Rye-Grass. In shaded ground; introduced in lawn seed.
- Lolium temulentum* L. Poison Darnel. Introduced. Armstrong (Cratty).
- Hordeum jubatum* L. Wild Barley. An abundant weed in low ground.
- Elymus virginicus* L. Terrell Grass. Low borders of woods and along river banks. Forma *hirsutiglumis* (Scribn.) Fern. High Lake, Estherville.
- Elymus virginicus* L. var. *jejunus* (Romalay) Bush. High Lake.
- Elymus virginicus* L. var. *submuticus* Hook. High Lake.
- Elymus villosus* Muhl. Slender Wild Rye. Open woods and borders. Forma *arkansanus* (Scribn. & Ball) Fern. River bank north of Estherville.
- Elymus macounii* Vasey. Open woods near Estherville.
- Elymus interruptus* Buckl. Borders and open woods at High Lake and Estherville (Oak Hill).
- Elymus canadensis* L. Canada Lyme-Grass. Borders and banks. Green or very glaucous. The very large form *E. robustus* Scribn. & Sm. is abundant along fence-rows and in road ditches.
- Hystrix patula* Moench. var. *bigeloviana* (Fern.) Deam. Bottle-brush Grass. Common in woods.
- Sphenopholis obtusata* (Michx.) Scribn. var. *lobata* (Trin.) Scribn. On dry or gravelly prairie.
- Sphenopholis intermedia* Rydb. Low ground and wooded hillsides.
- Koeleria cristata* (L.) Pers. Common on dry ground.
- Sporobolus cryptandrus* (Torr.) Gray. Sand Drop-seed. Sandy shores and banks. Tuttle, Iowa, and Eagle Lakes; Des Moines River.
- Sporobolus cryptandrus* var. *strictus* Scribn. River bank near disposal plant, Estherville.
- Sporobolus vaginiflorus* (Torr.) Gray var. *inaequalis* Fern. Poverty-Grass. In dry, rather sterile soil; old pastures.
- Sporobolus neglectus* Nash. On dry hillsides in old pastures.
- Sporobolus asper* (Michx.) Knuth. Banks of Iowa Lake; Des Moines River in High Lake.
- Sporobolus heterolepis* Gray. Northern Drop-seed. Bunch-grass. Wire-grass. A high prairie grass.
- Calamagrostis canadensis* (Michx.) Nutt. Blue-joint Grass. Low land bordering marshes and swamps.
- Calamagrostis canadensis* var. *macouniana* (Vasey) Stebbins. Local in marshes and wet meadows in the High-Ingham lakes area.
- Calamagrostis inexpansa* Gray. var. *brevior* (Vasey) Stebbins. Borders of marshes; fens.
- Calamovilfa longifolia* (Hook.) Scribn. Cratty collected this inside the county near Iowa Lake.
- Agrostis alba* L. Red top. In low pastures and meadows.
- Agrostis alba* var. *palustris* (Huds.) Pers. Creeping Bent. Along the flood plain of the Des Moines River north of Estherville.
- Agrostis hyemalis* (Walt.) BSP. Hairgrass. In sterile soil and low ground.
- Agrostis scabra* Willd. Reported by Dr. R. T. Thorne.
- Agrostis perennans* (Walt.) Tuckerm. In dry open soil. Estherville.
- Cinna arundinacea* L. Wood Reedgrass. In moist places in woods.
- Phleum pratense* L. Timothy. Common naturalized grass.
- Alopecurus aequalis* Sobol. Marsh Foxtail. Edge of shallow water, shores and ditches.
- Muhlenbergia cuspidata* (Nutt.) Rydb. Plains Muhlenbergia. High prairie knolls in Emmet Tp.
- Muhlenbergia shreberi* J. F. Gmel. Nimble Will. Dooryard and sandy woods at High Lake.
- Muhlenbergia sylvatica* Torr. Woodland Dropseed. Open woods and thickets.
- Muhlenbergia mexicana* Trin. Low sandy woods northeast side of High Lake.

- Muhlenbergia frondosa* (Poir.) Fern. Wiry Dropseed. A common weed in clearings, waste ground, orchards.
- Muhlenbergia glomerata* (Willd.) Trin. var. *cinnoides* (Link) F. J. Herm. Marsh Muhlenbergia. In wet meadows and other low ground.
- Brachyelytrum erectum* (Schreb.) Beauv. In upland woods. High Lake and Estherville.
- Oryzopsis racemosa* (Sm.) Ricker. Black-fruited Mountain-Rice. Upland woods and rocky banks.
- Stipa viridula* Trin. Feather-Bunchgrass. Originally found on the isthmus on the northwest side of High Lake and also on the southeast side; on high wooded bank near the east end of Swan Lake. Has since spread to other portions of the banks of High Lake.
- Stipa spartea* Trin. Porcupine-Grass. A common grass on dry prairie remnants.
- Aristida longiseta* Steud var. *robusta* Merr. Needlegrass. On high pastured prairie, sections 29 and 30 in Emmet Tp.
- Spartina pectinata* Link. Slough-Grass. Around marshes and along low prairie roadsides. Very variable; grades into smaller, slender-spiked forms which have been referred to the following.
- Spartina pectinata* var. *suttiei* (Farw.) Fern. Low prairie roadsides.
- Beckmannia syzigachne* (Steud.) Fern. In marshes and along water-courses.
- Bouteloua gracilis* (HBK.) Lag. Grama-Grass. On gravelly knolls and ridges along west Des Moines River.
- Bouteloua hirsuta* Lag. Gravelly knolls and ridges along west Des Moines River.
- Bouteloua curtipendula* (Michx.) Torr. Tall Grama-Grass. Common on upland prairie and knolls.
- Phalaris arundinacea* L. Reed-Canary-Grass. Originally native along margins of marshes. Has since been cultivated for hay and pasture and has become widely established. Abundant along flood plain of the Des Moines River at Estherville.
- Hierochloa odorata* (L.) Beauv. Vanilla Grass. Locally frequent along low prairie roadsides.
- Leersia virginica* Willd. Whitegrass. Low, wet places in woods.
- Leersia oryzoides* (L.) Sw. Rice-Cutgrass. Borders of marshes and in ditches.
- Zizania aquatica* L. var. *angustifolia* Hitch. Wild Rice. This narrow-leaved variety has been common in Cheever Lake and adjacent marshes in recent years.
- Zizania aquatica* var. *interior* Fassett. This is probably the variety originally native in this area. Rare in High Lake marshes in 1908, but reported by Cratty as frequent in marshes in early years. Has been planted in lakes since early in the century.
- Digitaria ischaemum* (Schreb.) Muhl. Small Crab-Grass. An introduced weed in lawns and yards.
- Digitaria sanguinalis* (L.) Scop. Large Crab-Grass. An introduced weed in lawns, gardens, and waste ground.
- Panicum dichotomiflorum* Michx. Along the Des Moines River. Sometimes a weed in back alleys in towns.
- Panicum capillare* L. Old-witch Grass. A common weed. Late in the season common in drowned out areas in fields.
- Panicum gattingeri* Nash. Armstrong (Pammel and Cratty).
- Panicum virgatum* L. Switchgrass. Moist prairie but sometimes in drier situations.
- Panicum perlongum* Nash. Dry prairie, south part of Twelve-mile Lake Tp. Near Oak Hill, Estherville.
- Panicum linearifolium* Scribn. In open places in upland woods south of Estherville, sect. 15, Estherville. Specimens determined by Mrs. Agnes Chase.
- Panicum lanuginosum* Ell. var. *fasciculatum* (Torr.) Fern. (*P. huachucae* Ashe). On dry prairie sect. 28, Emmet. In dry, open upland woods sect. 15, Estherville. Often in spots which had been wet early in the season.

- Panicum lanuginosum* var. *implicatum* (Scribn.) Fern. Once abundant in peaty meadows in High Lake woods, where it has been destroyed. In peaty prairie along Rock Island R. R. tracks sect. 25, and in moist spots in open upland woods sect. 15, Estherville Tp.
- Panicum auburne* Ashe. In open spots in upland woods south of Estherville, sect. 15, Estherville Tp. Collections of June, 1936, determined by Agnes Chase of the Bureau of Plant Industry, Washington, D. C.
- Panicum praecocius* Hitchc. & Chase. On prairie knolls, Emmet and Twelve-mile Lake. In open upland woods, sect. 15, Estherville.
- Panicum wilcoxianum* Vasey. On gravelly knolls, Estherville and Emmet.
- Panicum oligoanthes* Schultes var. *scribnerianum* (Nash) Fern. On dry prairie and knolls. High Lake and Estherville.
- Panicum leibergii* (Vasey) Scribn. On dry prairie. High Lake, Emmet. Once common in prairie opening in High Lake woods.
- Echinochloa crusgalli* (L.) Beauv. Barnyard-Grass. In barnyards, wet fields, and mud flats.
- Echinochloa pungens* (Poir.) Rydb. Sandy bottom of Swan Lake.
- Setaria geniculata* (Lam.) Beauv. On state land, northeast side of Ingham Lake.
- Setaria glauca* (L.) Beauv. Pigeon-Grass. Introduced weed.
- Setaria verticillata* (L.) Beauv. Bristly Foxtail. A bad weed in vacant lots and neglected gardens.
- Setaria verticillata* var. *ambigua* (Guss.) Parl. Vacant lots and gardens. Estherville.
- Setaria viridis* (L.) Beauv. Green Foxtail. Introduced weed.
- Setaria faberii* Herm. Abundant in soy bean fields, Ellsworth.
- Cenchrus longispinus* (Hack.) Fern. In railroad yards, waste places in towns, and in sand along lake shores.
- Andropogon scoparius* Michx. var. *neo-mexicanus* (Nash) Hitchc. Little Bluestem. An upland prairie grass still common along dry roadsides.
- Andropogon gerardi* Vitman. (*A. furcatus* Muhl.) Big Bluestem. A valuable prairie grass still common along roadsides.
- Sorghastrum nutans* (L.) Nash. Indian Grass. On dry prairie and prairie openings in woods.

CYPERACEAE

- Cyperus diandrus* Torr. Low Cyperus. Locally common in wet ground and along beaches.
- Cyperus rivularis* Kunth. Shining Cyperus. Very abundant locally; low, wet ground and shores.
- Cyperus inflexus* Muhl. Awned Cyperus. Common; low, wet ground and beaches.
- Cyperus erythrorhizos* Muhl. Along muddy beaches and on mud flats.
- Cyperus ferruginescens* Boeckl. On sandy or muddy shores.
- Cyperus engelmanni* Steud. Along shores of Cheever Lake.
- Cyperus esculentus* L. Once common in cultivated ground, southwest part of Estherville.
- Cyperus strigosus* L. Common along muddy shores.
- Cyperus schweinitzii* Torr. In dry sand along lake shores. High, Tuttle, and Swan lakes.
- Eleocharis pauciflora* (Lightf.) Link var. *Fernaldii* Svenson. Frequent in large fen, sec. 21, Emmet.
- Eleocharis acicularis* (L.) R. & S. Needle Spike-Rush. Along shores and shallow borders of ponds and sloughs.
- Eleocharis wolfii* Gray. In a wet depression at the edge of the upland woods in sect. 15, Estherville Tp. Also collected by Cratty near Armstrong in 1882.
- Eleocharis palustris* (L.) R. & S. var. *major* Sonder. Spike-rush. This is usually growing in water at the edges of marshes or in small prairie depressions. The culms are terete in fresh material on which pressure has not been applied.
- Eleocharis smallii* Britt. Mostly in water, often in roadside ditches. North side of sect. 12, Emmet.

- Eleocharis macrostachya* Britt. A number of Emmet County specimens in the herbarium of I. S. C. have been assigned to this species.
- Eleocharis calva* Torr. Very common in wet situations.
- Eleocharis compressa* Sulliv. Along shallow ditches of highways and railroads where top soil was removed in construction. Emmet and Estherville townships.
- Eleocharis elliptica* Kunth. Abundant in large fen in sect. 21, Emmet. Early material collected in 1930 was first reported as *E. tenuis*, but was later identified as *E. elliptica* by Dr. H. K. Svenson.
- Scirpus americanus* Pers. Three-square Rush. In nearby localities this grows along gravelly shores. In Emmet County it is found only in the fens along the Des Moines River.
- Scirpus validus* Vahl. var. *creber* Fern. Soft-stem Bulrush. In shallow water in sloughs and ponds.
- Scirpus acutus* Muhl. Hard-stem Bulrush. Mostly in permanent water, as in shallow parts of lakes.
- Scirpus heterochaetus* Chase. Slender Bulrush. In shallow sloughs and swamps.
- Scirpus fluviatilis* (Torr.) Gray. River Bulrush. Great masses of this have occurred in shallow water in muddy bays and in sloughs at various times.
- Scirpus atrovirens* Willd. Green Bulrush. In marshy borders, around springs, and in roadside ditches.
- Scirpus atrovirens* var. *georgianus* (Harper) Fern. Between sect. 15 and 22, Ellsworth Tp.
- Scirpus pallidus* (Britt.) Fern. Around springs and in roadside ditches.
- Eriophorum gracile* W. E. J. Koch. Slender Cotton-grass. Collected by Cratty in eastern part of the county in early years.
- Eriophorum angustifolium* Honckeny var. *majus* Schultz. Tall Cotton-grass. Formerly on low prairie. Along Rock Island R. R., sect. 22, Estherville Tp. In large fens in Estherville and Emmet townships.
- Rhynchospora capillacea* Torr. Beaked Rush. Abundant in fens in Emmet and southward.
- Scleria verticillata* Muhl. Nut-rush. Abundant in fens in Emmet, especially in large fen in sect. 21. Has not been reported from any other county in the state.
- Carex stenophylla* Wahlenb. var. *enervis* (C. A. Mey) Kukenth. Found for the first time in Iowa, at Estherville, by Cratty in 1882. It is still found along the M. & St. L. R. R. tracks in the south part of town. Locally abundant on gravelly knolls in Emmet Tp.
- Carex praegracilis* W. Boott. On gravelly prairie north of Rock Island branch tracks, southeast part of Estherville.
- Carex chordorrhiza* L. F. Cratty collected this in a bog two and one-half miles north of Armstrong in 1878, and during subsequent years.
- Carex sartwellii* Dew. Along margins of sloughs and on wet prairie.
- Carex convoluta* Mackenz. Common in dry woods and along wooded banks.
- Carex rosea* Schkuhr. Fairly common in woods.
- Carex cephalophora* Muhl. Very rare. Along east bank of Des Moines River north part of Estherville, sect. 3, Estherville Tp.
- Carex gravida* Bailey. Common in various situations. In open, grassy woods, but also along low, or dry prairie roadsides. Varies much in appearance according to habitat. Forma *laxifolia* (Bailey) Kukenth. is often the form in woods.
- Carex cephaloidea* Dew. In open woods, shady hillsides, and in grassland.
- Carex sparganioides* Muhl. Frequent in Estherville and High Lake woods.
- Carex vulpinoidea* Michx. Fox Sedge. Growing in tufts in wet land and in roadside ditches.
- Carex annectens* Bick. var. *xanthocarpa* (Bickn.) Wieg. Edges of marshes and in springy ground.
- Carex diandra* Schrenk. In fens and on wet prairie.
- Carex prairea* Dew. In fens and on wet prairie.
- Carex alopecoidea* Tuckerm. Locally abundant along the Des Moines River flood plain at Estherville; in open ground and low woods.

- Carex stipata* Muhl. Abundant around springy places and in swampy areas.
- Carex deweyana* Schwein. Very rare. Above south side of School Section Creek in Fort Defiance Park. Upland woods west of Highway 17 bridge.
- Carex interior* Bailey. In wet places, around springs, in fens, and formerly on wet prairie.
- Carex scoparia* Schkuhr. Broom Sedge. In grassy places and on prairie.
- Carex tribuloides* Wahlenb. Meadows and low open woods.
- Carex projecta* Mackenz. In low woods and grasslands. High Lake.
- Carex cristatella* Britt. Crested Sedge. Common in wet places in woods. Abundant on the Des Moines River floodplain.
- Carex bebbii* Olney. In wet grassland and common in roadside ditches.
- Carex normalis* Mackenz. In woods. Also forma *perlonga* Fern. at High Lake.
- Carex tenera* Dew. In moist, or drier grassland and in open woods. High Lake, Estherville.
- Carex tenera* var. *echinodes* (Fern.) Wieg. In marshy ground and grassy woods.
- Carex festucacea* Schkuhr. Along M. & St. L. R. R. tracks, south part of Estherville.
- Carex suberecta* (Olney) Britt. Rare. In old gravel pit bottom, sect. 21, Emmet Tp.
- Carex brevior* (Dew.) Mackenz. Open grassland; prairie roadsides.
- Carex molesta* Mackenz. In grassland, High Lake. Along an old river channel north of Estherville, sect. 2, Estherville Tp.
- Carex bicknellii* Britt. On prairie and prairie openings, High Lake.
- Carex sychnocephala* Carey. Originally very local. Ingham Lake; also along water course to Swan Lake, and in marsh east of Armstrong. Has since become abundant along west Des Moines River flood plain and in other water courses.
- Carex pennsylvanica* Lam. Common on high or gravelly prairie and on open wooded ridges.
- Carex pennsylvanica* var. *digyna* Boeckl. On gravelly prairie, ridges and knolls.
- Carex artitecta* Mackenz. Along the wooded banks of High and Ingham lakes. Rare at Estherville, west of Highway 17 bridge.
- Carex pedunculata* Muhl. Rare on wooded slope to the north of Oak Hill Cemetery, Estherville.
- Carex richardsonii* R. Br. Rare. On open ridge in woods south of Estherville, west of Highway 17 bridge.
- Carex eburnea* Boot. Along high wooded banks and sides of ravines at Estherville.
- Carex hirtifolia* Mackenz. Common in large wooded ravine south of Estherville, sect. 15, Estherville Tp.
- Carex aquatilis* Wahlenb. var. *altior* (Rydb.) Fern. Around the edges of sloughs, marshes, and fens, Emmet Tp.
- Carex stricta* Lam. In fens in Emmet and Estherville townships, and abundant in roadside ditches.
- Carex emoryi* Dew. Edges of marshes and in fens.
- Carex haydenii* Dew. Fens in Emmet Tp.; grassy floodplain south part of Estherville.
- Carex buxbaumii* Wahlenb. Rare in fens in sect. 21 and other situations in Emmet. Armstrong (Cratty).
- Carex limosa* L. Cratty made several collections of this in the Armstrong vicinity in early years.
- Carex lasiocarpa* Ehrh. var. *americana* Fern. In fens and in shallow water in sloughs.
- Carex lanuginosa* Michx. In wet grassland and along borders of marshes.
- Carex gracillima* Schwein. Graceful Sedge. Very rare here and in the state. Was once found in low woods in what is now the west part of Oak Hill Cemetery.
- Carex assiniboinensis* W. Boott. Rare in Iowa. Found locally in woods along the southwest bank of Ingham Lake. Also in woods at the east end of Swan Lake.

- Carex sprengelii* Dew. Long-beaked Sedge. Common in woods and along wooded banks.
- Carex crawei* Dew. Rare in Iowa. Collected by Cratty near Armstrong in early years.
- Carex amphibola* Steud. var. *turgida* Fern. Frequent in rather moist woods and established in orchards and yards.
- Carex meadii* Dew. On upland prairie and hillsides, and open woods; also low prairie and shallow highway ditches.
- Carex tetanica* Schkuhr. In fens in Emmet and Estherville townships. Also in patches along sides of Highway 17, north of Estherville.
- Carex blanda* Dew. Very abundant in open woods, bottomlands and thickets.
- Carex lacustris* Willd. A large sedge, prominent in swamps and sloughs. Once abundant in and around High Lake woods.
- Carex atherodes* Spreng. Once abundant in marshes in and around High Lake woods.
- Carex laeviconica* Dew. Banks and bottomlands along the Des Moines River near Estherville. High Lake.
- Carex trichocarpa* Muhl. Hairy-fruited Sedge. Once abundant in low meadow at High Lake. Banks of Des Moines River, Estherville.
- Carex comosa* Boot. Bristly Sedge. Infrequent around the margins of ponds and sloughs. High Lake, Estherville, Armstrong.
- Carex hystricina* Muhl. Porcupine Sedge. Abundant in fens in Emmet and Estherville townships, and in springy places along the Des Moines River.
- Carex lupulina* Muhl. Hop Sedge. Collected near Iowa Lake by Cratty.
- Carex retrorsa* Schwein. Retrorse Sedge. Locally frequent in low woods at High Lake; in springy places along the Des Moines River at Estherville; Iowa Lake.
- Carex rostrata* Stokes var. *utriculata* (Boot.) Bailey. Beaked Sedge. Once abundant in shallow water in low meadow in High Lake woods.
- Carex vesicaria* L. var. *monile* (Tuckerm.) Fern. Local in marshy areas. High Lake, Swan Lake, Armstrong.

ARACEAE

- Arisaema atrorubens* (Ait.) Blume. Jack-in-the-pulpit, Indian-turnip. In rich woods.
- Acorus calamus* L. Sweetflag. Along margins of ponds and sloughs, and in depressions and old channels along the Des Moines River.

LEMNACEAE

- Spirodela polyrhiza* (L.) Schleid. Duckweed. Floating on water in ponds, sloughs, and shallow bays of lakes.
- Lemna trisulca* L. Ivy-leaved Duckweed. Some years abundant in rush-grown ponds and lakes, such as Four-mile, Cheever, and Eagle lakes.
- Lemna minor* L. Lesser Duckweed. Abundant in sloughs, swamps, and slow ditches.
- Wolffia columbiana* Karst. Water-meal. This has not been as common in Emmet County lakes in recent years as in those of nearby counties. Abundant in Eagle Lake; ponds around High and Ingham lakes.

COMMELINACEAE

- Tradescantia bracteata* Small. Spiderwort. On prairies, in grassy woodlands, on railroad ballast, and along shoulders of gravelled roads. Color varies from roseate to blue, and rarely white.
- Tradescantia occidentalis* (Britt.) Smyth. Specimen collected by Cratty and reported by D. G. Deihl.

PONTEDERIACEAE

- Heteranthera dubia* (Jacq.) Macm. Water-Stargrass. Along the edges of shallow ponds, on mud or in shallow water.

JUNCACEAE

- Juncus tenuis* Willd. Slender Rush. Along hard paths and in tramped ground.
- Juncus dudleyi* Wieg. In moist ground bordering lakes and sloughs, in fens and in highway ditches.
- Juncus balticus* Willd. var. *littoralis* Engelm. In wet gravel pit bottom, south part of Estherville, low prairie sect. 33, Emmet. Armstrong (Cratty).
- Juncus nodosus* L. Borders of sloughs, roadside ditches.
- Juncus torreyi* Coville. In wet ground; highway ditches where black soil has been removed.
- Luzula multiflora* (Ratz.) Lejeune. Woodrush. Upland woods south of Estherville.

LILIACEAE

- Zigadenus elegans* Pursh. White Camass. Moist prairie and very common on Des Moines River gravel plain; north slopes of gravel knolls.
- Uvularia grandiflora* Sm. Bellwort. Common in rich woods.
- Uvularia sessilifolia* L. (*Oakesia* S. Wats.) Sesile-leaved Bellwort. Very rare. Has been restricted to a small patch in High Lake woods.
- Allium canadensis* L. Wild Garlic. Low prairie, open woods, and banks.
- Allium stellatum* Fraser. Prairie Wild Onion. Common on dry or moist prairie; banks.
- Allium tricoccum* Ait. Wild Leek. Abundant in High Lake woods. Less common in Estherville woods.
- Hemerocallis fulva* L. Day-Lily. Sometimes escaped from cemeteries to adjacent roadsides.
- Lilium philadelphicum* L. var. *andinum* (Nutt.) Ker. Western Orange-red Lily. Dry prairie. Has become rare.
- Lilium michiganense* Farw. Michigan Lily. Once abundant in a meadow and woodland border in High Lake woods. Still occurs on bits of low virgin prairie.
- Erythronium albidum* Nutt. White Dog's-tooth-Violet. Common in rich woods.
- Asparagus officinalis* L. Asparagus. Frequently escaped from cultivation.
- Smilacina racemosa* (L.) Desf. False Spikenard. Common in woods.
- Smilacina stellata* (L.) Desf. False Solomon's-seal. Woods, borders, and thickets.
- Maianthemum canadense* Desf. var. *interius* Fern. False. Lily-of-the-valley. Rare in high woods in the south part of sect. 15, Estherville Tp.
- Polygonatum canaliculatum* (Muhl.) Pursh. Solomon's-seal. Borders of woods, thickets, and banks. Peduncles up to 16-flowered.
- Convallaria majalis* L. Lily-of-the-valley. Established in high woods, north of the valley in Fort Defiance State Park.
- Trillium cernuum* L. var. *macranthum* Wieg. Nodding Wakerobin. This species is predominant in High Lake woods. Our two large *Trilliums* might be regarded as one highly variable species, although the extremes are quite different. This is the smaller plant with smaller leaves and flowers, shorter recurved peduncle, smaller anthers, and proportionately longer filaments.
- Trillium flexipes* Raf. (T. *Gleasoni* Fern., T. *declinatum* (Gray) Gleason). High Lake and Estherville. This may be up to 20 inches tall, and larger in every way. The long peduncle is horizontal but usually under the leaves. In our plant the anthers may be as much as 10 mm long, and twice as long to the same length as the filaments.
- Trillium nivale* Riddell. Snow-Trillium. Common in Estherville woods, Abundant in the valley of School-section Creek in Fort Defiance Park.
- Smilax herbacea* L. Smooth Carrion-flower. In rather open woods, hillsides. Fort Defiance State Park.
- Smilax lasioneura* Hook. Hairy-nerved Carrion-flower. The most common form. Along borders and in thickets.

- Smilax ecirrhata* (Engelm.) S. Wats. Common in woods.
Smilax tamnoides L. var. *hispida* (Muhl.) Fern. Hispid Greenbrier. A
 bristly vine in woods.

AMARYLLIDACEAE

- Hypoxis hirsuta* (L.) Coville. Yellow Stargrass. Common on low prairie.

IRIDACEAE

- Sisyrinchium campestre* Bick. Blue-eyed Grass. On low, or often on dry
 prairie.
Iris virginica L. var. *shrevei* (Small) E. Anders. Iris, Blue Flag. Common
 around marshes and often persisting along low prairie roadsides.

ORCHIDACEAE

- Cypripedium calceolus* L. var. *pubescens* (Willd.) Correll. Large Yellow
 Lady's-slipper. Moccasin-flower. Probably extinct at High Lake. Rare
 in Estherville woods, except on a slope in Fort Defiance State Park.
Cypripedium candidum Muhl. Small White Lady's-slipper. On wet prairie
 and in fens. Sect. 22, High Lake; sections 25 and 3, Estherville; sect.
 34 Emmet. According to Cratty it was once frequent.
Cypripedium reginae Walt. Showy Lady's-slipper. In 1922 this was still
 found in several places in the Estherville woods. As far as known all
 such stations have since been destroyed.
Orchis spectabilis L. Showy Orchis. Once locally common in High Lake
 woods, along both sides of line between sections 11 and 14, High Lake
 Tp. Otherwise it was rare. It was still found in 1930, but has now
 been absent for many years.
Habenaria viridis (L.) R. Br. var. *bracteata* (Muhl.) Gray. Long-bracted
 Green Orchis. Rare in High Lake woods; more frequent on north
 slopes in Estherville woods.
Habenaria hyperborea (L.) R. Br. var. *huronensis* (Nutt.) Farw. North-
 ern Green Orchis. Rare. In fens in sect. 3, Estherville Tp.
Habenaria leucophaea (Nutt.) Gray. Prairie White Fringed Orchis. Rare
 on low prairie. Still to be found in small colonies in the following
 places: Rock Island R. R. right-of-way sect. 36, Estherville Tp.; north
 of highway 9, on low virgin prairie along Rock Island R. R. right-of-
 way sects. 4 and 5, Estherville Tp.; and along M. & St. L. R. R.
 right-of-way sect. 2, Estherville Tp.
Spiranthes cernua (L.) Richard Nodding Ladies'-tresses. Originally on low
 prairie. Has persisted along M. & St. L. R. R. right-of-way northward
 from Estherville, from where in recent years it has spread to sides of
 Highway 17.
Spiranthes romanzoffiana Cham. Hooded Ladies'-tresses. Chiefly in large
 fen in sect. 21, Emmet. This comes into bloom in mid-July; the species
 above usually about mid-September.
Liparis loeselii (L.) Richard. Twayblade. In large fen sect. 3, Estherville
 Tp.; old gravel pit bottom, south part of Estherville.

DICOTYLEDONEAE

SALICACEAE

- Salix nigra* Marsh. Black Willow. Mostly along streams.
Salix amygdaloides Anderss. Peach-leaved Willow. Most common around
 lakes and sloughs.
Salix pentandra L. Bay-leaved Willow. Planted and a rare escape.
Salix lucida Muhl. Shining Willow. Once was found in marshes in the
 northeastern part of the county, and along the banks of a creek in
 sect. 36, Estherville Tp. There has remained a tree in a gravel pit
 bottom in the south part of Estherville.
Salix fragilis L. Crack Willow. This planted willow has spread along lake
 banks and streams.

- Salix interior* Rowlee. Sandbar Willow. Along streams and in other wet places. Abundant in abandoned gravel pits where forma *wheeleri* (Rowlee) Rouleau often is prominent.
- Salix rigida* Muhl. Heart-leaved Willow. Along streams and around marshes.
- Salix eriocephala* Michx. Along streams and around marshes.
- Salix bebbiana* Sarg. Bebb's Willow. On springy hillsides in Estherville woods and in fens. Formerly in marshes in Iowa Lake.
- Salix pedicularis* Pursh. var. *hypoglauca* Fern. Bog Willow. Cratty found this in a bog two miles north of Armstrong.
- Salix discolor* Muhl. Pussy-Willow. Once common but has mostly disappeared except in fens and around springs.
- Salix discolor* var. *latifolia* Anderss. In same situations as the preceding.
- Salix humilis* Marsh. Prairie Willow. Persists on a few ridges in open woods and prairie.
- Salix humilis* var. *microphylla* (Anderss.) Fern. Dwarf Gray Willow. Rare and local. On exposed ridge across the ravine north of Oak Hill Cemetery. Reported by Dr. Ada Hayden from sect. 23, Estherville Tp.
- Salix gracilis* Anderss. var. *textoris* Fern. Slender Willow. Common in fens in Emmet and Estherville townships and southward along the Des Moines River.
- Salix subsericea* (Anderss.) Schneid. In a large swamp in sections 29 and 32 in High Lake Tp. Material determined by Dr. Ball in 1930. Fernald called this a hybrid of the preceding variety with *Salix sericea* Marsh. However, the latter species has not been recorded from this part of the state.
- Salix candida* Flugge. Hoary Willow. Rare. Found only in a large fen in sect. 23, Estherville Tp. This is probably the most westerly station in Iowa.
- Populus tremuloides* Michx. American Aspen. Common in upland woods in the Estherville hills. Used to grow at High and Ingham lakes; also in clumps around prairie sloughs.
- Populus grandidentata* Michx. Large-toothed Aspen. There were originally a number of trees of this species in the woods in the west part of Estherville.
- Populus alba* L. Silver Poplar. A planted tree since pioneer times, and which persists by suckers long after the original trees have been removed.
- Populus deltoides* Marsh. Cottonwood. Remaining following pioneer times were great specimens along lake banks, especially around High Lake. Later much planted in farm groves.
- Populus balsamifera* L. Balsam-Poplar. Specimens from trees in Fort Defiance State Park were referred to this species by C. A. Weatherby many years ago. The leaves are broader than on trees in the north, but are subcuneate to rounded, and *not* subcordate at base. On the southeast banks of Swan Lake there were years ago large trees with leaves cordate to subcordate at base, but not pubescent, or at least very slightly so on the petioles. Trees of a similar form used to grow along the bank of the northwest side of Spirit Lake, in Dickinson County.

JUGLANDACEAE

- Juglans nigra* L. Black Walnut. In woods throughout. There were great specimens at High Lake in earlier years.
- Carya cordiformis* (Wang.) K. Koch Bitternut. General, but most common at High Lake.

CORYLACEAE

- Corylus americana* Walt. Hazelnut. Formerly abundant on cut-over areas, and in borders.
- Ostrya virginiana* (Mill.) K. Koch var. *lasia* Fern. Hop-Hornbeam, Ironwood. Common; upland woods and also ravines.
- Betula pendula* Roth. European Birch. There have been a few fair-sized trees in the state park woods, seedlings of cultivated trees. Such are usually short-lived.

FAGACEAE

- Quercus macrocarpa* Michx. Bur Oak. Of general distribution. Around sloughs and marshes there have been in many places solid stands of young Bur Oak projecting out from the large mixed woods. It has been suggested that this growth may have appeared after the prairie fires ceased. Early in the century there remained many giant oaks in the High Lake woods, the largest were 4-5 feet in diameter and between 300 and 400 years old. On a few ridges and high prairie knolls in High Lake and Emmet townships this oak has appeared as a shrub, sometimes not more than two feet in height, and some years loaded with acorns. This has been referred to as var. *depressa* (Nutt.) Eng. but it is not mentioned in Gray.
- Quercus rubra* L. Red Oak. Trees with the large acorns with shallow cups typical of this species are infrequent, and most of the trees in the Estherville woods are rather referable to the following variety.
- Quercus rubra* var. *borealis* (Michx.) Farw. Northern Red Oak. Most common in upland woods.
- Quercus ellipsoidalis* E. J. Hill. Jack-Oak. Specimens from Estherville sent to Arnold Arboretum were determined as this species. The author has not seen a specimen with acorns typical of the species and such as are found farther east in the state. Our trees referable to this species may be called forma *depressa* (Vasey) Trel.

ULMACEAE

- Ulmus rubra* Muhl. Slippery or Red Elm. A common tree.
- Ulmus pumila* L. Chinese Elm. Seedlings from planted trees are abundant along some roadsides. Such are usually destroyed but some trees have appeared in woods.
- Ulmus americana* L. American Elm. Common native tree and much planted.
- Ulmus thomasi* Sarg. Rock or Cork Elm. A few scattered trees remain at Estherville. The largest tree is in a ravine north and west of 14 Ave. and North 5 St.
- Celtis occidentalis* L. Hackberry. Frequent but scattered. Most common in High Lake and Swan Lake woods.
- Celtis occidentalis* var. *pumila* (Pursh.) Gray. Probably the most common form. Hillsides, slopes and lower woods.

MORACEAE

- Morus alba* L. Mulberry. Occasionally escaped into woods.

CANNABINACEAE

- Canabis sativa* L. Hemp. Established in open woods and pastures.
- Humulus lupulus* L. Hop. Local along river and creek banks. Emmet, Estherville.

URTICACEAE

- Urtica procera* Muhl. Nettle. Fence rows, farm groves, and waste ground.
- Laportea canadensis* L. Wood-Nettle. Dominant in rich woods.
- Pilea pumila* (L.) Gray. Richweed, Clearweed. In wet shady places; around springs.
- Pilea pumila* var. *deamii* (Lunell) Fern. Similar habitats along river north of Estherville.
- Boehmeria cylindrica* (L.) Sv. False Nettle. Rare and local. Low swampy woods, southeast side of Ingham Lake.
- Parietaria pensylvanica* Muhl. Pellitory. Dry woods; among perennials and shrubs in yards.

SANTALACEAE

- Comandra richardsoniana* Fern. Bastard-Toadflax. Common on prairie hills and open ridges in woods.

ARISTOLOCHIACEAE

- Asarum canadense* L. var. *acuminatum* Ashe. Wild Ginger. Common in Estherville woods.

POLYGONACEAE

- Rumex mexicanus* Meisn. Pale Dock. Roadside weed.
Rumex altissimus Wood. Peach-leaved Dock. Low ground; river bottoms.
Rumex patientia L. Patience Dock. Roadside between sections 18 and 19, Ellsworth. Introduced.
Rumex orbiculatus Gray (*R. britanica* sensu ed. 7) Great Water-Dock. In sloughs and marshes.
Rumex crispus L. Curled Dock. Wet ground and roadsides.
Rumex persicarioides L. Golden Dock. On mud flats in late summer.
Rumex acetosella L. Sheep-sorrel. Introduced in old fields; fallow or neglected ground.
Tovara virginiana (L.) Virginia Knotweed. Two stations on or near the banks of Ingham Lake, at least one of which is destroyed.
Polygonum ramosissimum Michx. Bushy Knotweed. Also forma *atlanticum* Robins. Along dry shores and roadsides.
Polygonum erectum L. Large Dooryard weed. Yards and roadsides.
Polygonum aviculare L. Dooryard Weed. Dooryards and along paths; tramped ground. Includes with other forms *P. neglectum* Bess. along shores, Des Moines River.
Polygonum aviculare var. *vegetatum* Ledeb. Shores; Des Moines River.
Polygonum aviculare L. var. *littorale* (Link) W. D. J. Koch. (*P. buxiforme* Small). On railroad ballast at Estherville. In old gravel pit, Emmet Tp.
Polygonum amphibium L. var. *stipulaceum* (Coleman) Fern. forma *simile* Fern. Water-Smartweed. Leaves floating on water. Outlets of High and Ingham lakes, marshes, and other shallow waters.
Polygonum amphibium L. var. *stipulaceum* forma *hirtuosum* (Farw.) Fern. (*P. hartwrightii* Gray) The terrestrial form, growing along margins of marshes and on low prairie.
Polygonum coccineum Muhl. var. *pratincola* (Greene) Stanford. (*P. muhlenbergii* (Meish.) S. Wats.) On wet prairie and in low fields. A persistent weed.
Polygonum pensylvanicum L. var. *laevigatum* Fern. Knotweed. A weed in low, wet fields.
Polygonum lapathifolium L. Tall Knotweed. Common in muddy fields. In seasons of drought completely occupying dried-up marshes and mud flats.
Polygonum hydropiper L. Smartweed. Common weed in wet ground.
Polygonum persicaria L. Lady's-thumb, Heart's-ease. Introduced weed in barnyards, fields, and roadside ditches.
Polygonum punctatum Ell. Water-Smartweed. Abundant. Borders of sloughs and in low ground where water may stand temporarily.
Polygonum convolvulus L. Black Bindweed. Introduced weed.
Polygonum scandens L. Climbing False Buckwheat. Mostly in low woods and thickets.

CHENOPODIACEAE

- Kochia scoparia* (L.) Roth. Summer-cypress. Introduced weed.
Chenopodium murale L. Introduced in cultivated ground and gardens.
Chenopodium urticum L. Along shaded river bank, Estherville.
Chenopodium polyspermum L. Greenhouse grounds; in gardens.
Chenopodium hybridum L. var. *gigantospermum* (Allen) Rouleau. Maple-leaved Goosefoot. A weed in farm groves and yards.
Chenopodium leptophyllum Nutt. On gravelly soil, south part of Estherville.
Chenopodium bosciarum Moq. In woods and shaded waste ground; yards.
Chenopodium album L. Lamb's Quarters. Pigweed. A common weed.
Chenopodium paganum Reichenb. Weed in cultivated and waste ground.
Chenopodium berlandieri Moq. Weed.
Chenopodium glaucum L. Oak-leaved Goosefoot. Dry beaches of lakes. Swan and High lakes. Introduced.
Chenopodium rubrum L. Coast-blite. In dry marshes and on mud flats.
Atriplex patula L. Orach. In alleys and waste ground in towns and on farms.

- Atriplex patula* var. *hastata* (L.) Gray. In waste ground; river bank, Estherville.
Atriplex rosea L. Red Orach. A few years ago introduced in a pasture in Ellsworth.
Salsola Kali L. var. *tenuifolia* Tausch. Russian Thistle. In a series of dry years becomes common in gravelly soil.

AMARANTHACEAE

- Amaranthus retroflexus* L. Pigweed. A troublesome weed.
Amaranthus albus L. Tumbleweed. In new soil and clearings.
Amaranthus graecizans L. Prostrate Tumbleweed. Barnyards, waste ground.
Acnida altissima Riddell. Water-Hemp. A weed in low fields.
Acnida tamariscina (Nutt.) Wood. Around marshes, on river flood-plains, and in drowned out areas in fields.

NYCTAGANCEAE

- Mirabilis nyctaginea* (Michx.) MacM. Wild Four o'clock. Roadsides and banks; weed in cultivated ground.
Mirabilis hirsuta (Pursh.) MacM. Gravelly roadside, Emmet Tp.
Mirabilis albida (Walt.) Heimerl. Dry prairie roadsides.

ARAZACEAE

- Mollugo verticillata* L. Carpetweed. Shore of Tuttle Lake. Introd.

PORTULACEAE

- Portulaca oleracea* L. Purslane. An introduced weed in gardens.

CARYOPHYLLACEAE

- Arenaria lateriflora* L. Sandwort. Infrequent in upland woods, south of Estherville.
Arenaria serpyllifolia L. On dry ridge, southwest part of Estherville. Introduced.
Stellaria media (L.) Cyrillo. Chickweed. Common weed in damp, shady lawns; also around springy, shaded places. Introduced.
Stellaria graminea L. Stitchwort. In open grassy woods, Oak Hill. Introduced.
Stellaria longifolia Muhl. Long-leaved Stitchwort. In wet places in open woods.
Cerastium vulgatum L. Mouse-ear Chickweed. In moist, shaded ground and pastures.
Cerastium nutans Raf. Nodding Chickweed. Common on wooded slopes west of Estherville.
Agrostemma githago L. Corn-Cockle. Formerly found in grain fields.
Lychnis alba Mill. White Campion. Introduced in fields and along roadsides.
Silene czerei Baumg. This was first observed along railroad tracks in the south part of Estherville, in 1925. This was one of the first places from which it was reported as established in this country. A native of southeastern Europe.
Silene stellata (L.) Ait. f. Starry Campion. Common, open woods and borders.
Silene antirrhina L. Sleepy Catchfly. Waste ground. Roadsides.
Silene noctiflora L. Night-flowering Catchfly. Weed in fields and roadsides.
Saponaria officinalis L. Bouncing-Bet. Established along roadsides near dwellings and cemeteries.
Saponaria vaccaria L. Cowherb. Adventive in wheat fields. (Cratty).
Gypsophila paniculata L. Baby's-breath. Escaped and abundant in old gravel pit in the southeast part of Estherville, east of M. & St. L. tracks.

CERATOPHYLLACEAE

- Ceratophyllum demersum* L. Hornwort. In quiet water. High Lake.

NYMPHAEACEAE

- Nuphar advena* (Ait.) Ait. f. Yellow Pond-lily. Pond east of High Lake; "Long Lake," High Lake Tp.; abundant in Cheever Lake.
Nymphaea tuberosa Paine. White Water-lily. Recorded by Cratty as once common in lakes. Persisted in Iowa Lake in the early twenties.

RANUNCULACEAE

- Ranunculus longirostris* Godr. Stiff White Water-Crowfoot. Formerly in small ponds and sloughs. In recent years in an old river channel north of Estherville; also abundant in a slough at the west end of Swan Lake. Later it again disappeared from these locations.
Ranunculus cymbalaria Pursh. forma *hebecaulis* Fern. Seaside Crowfoot. Along edges of ponds and sloughs and in wet places on low prairie.
Ranunculus flabellaris Raf. Yellow Water-Crowfoot. In shallow water in small prairie sloughs and in small sloughs in High Lake woods.
Ranunculus sceleratus L. Cursed Crowfoot. Edges and mud flats of ponds and marshes.
Ranunculus abortivus L. Kidney-leaf Crowfoot. Low or damp woods; flood plains.
Ranunculus rhomboideus Goldie. Early Prairie-buttercup. Found locally where bits of dry prairie remains.
Ranunculus pennsylvanica L. Bristly Crowfoot. Around marshes and in wet ground.
Ranunculus septentrionalis Poir. Buttercup. Low open woods, low prairie and alluvial bottoms.
Ranunculus acris L. Tall Buttercup. Reported by both Cratty and Ada Hayden.
Thalictrum dasycarpum Fisch. & Lall. Purple Meadow-Rue. Low prairie, meadows and borders.
Anemonella thalictroides (L.) Spach. Rue-Anemone. Rather rare in upland woods, southwest of Estherville.
Hepatica acutiloba DC. Hepatica. Very common in woods west and south of Estherville.
Anemone cylindrica Gray. Long-headed Anemone. Grassy open woods; upland prairie.
Anemone virginiana L. Thimbleweed. In open woods.
Anemone canadensis L. White Anemone. Roadsides, grasslands, open woods.
Anemone quinquefolia L. var. *interior* Fern. Wood-Anemone. Once local along a high bank and adjoining woods in the High-Ingham lakes area, but has been destroyed by clearing. Also local in high woods south of Estherville.
Anemone patens L. var. *wolfgangiana* (Bess.) Koch. Pasque-flower. Originally growing on most of the upland prairie, but more often on the northeast or east side of knolls and slopes. Still found where bits of such prairie remains.
Clematis virginiana L. Virgin's-bower. Along borders, wooded banks and roadsides.
Isopyrum biternatum (Raf.) T. & G. False Rue-Anemone. In rich woods.
Caltha palustris L. Marsh-Marigold. In marshes along the Des Moines River flood plain in High Lake, but more abundant in fens and around springs in Emmet and Estherville townships.
Aquilegia canadensis L. var. *hybrida* Hook. Wild Columbine. Wooded slopes and banks.
Delphinium virescens Nutt. Prairie Larkspur. On upland prairie and open wooded ridges.
Actaea rubra (Ait.) Willd. Red Baneberry. Rather frequent in woods.
Actaea rubra (Ait.) Willd. forma *neglecta* (Gillman) Robins. White-fruited Baneberry. Less frequent in woods. The plant reported by Fitzpatrick and also by Shimek as *Actaea alba* (L.) Mill. probably referred to this form.

BERBERADACEAE

- Caulophyllum thalictroides* (L.) Michx. Blue Cohosh. Common in woods, especially at High Lake.

MENISPERMACEAE

Menispermum canadense L. Moonseed. Open woods and borders.

PAPAVERACEAE

Sanguinaria canadensis L. Bloodroot. Common in rich woods.

Dicentra cucullaria (L.) Bernh. Dutchman's-Breeches. Common in rich woods.

Corydalis micrantha (Engelm.) Gray. Around edges of dry fields.

CAPPARIDACEAE

Polanisia graveolens Raf. Clammyweed. On dry sand of lake shores.

Polanisia trachysperma T. & G. Large-flowered Clammyweed. In similar situations but less common.

CRUCIFERAE

Draba reptans (Lam.) Fern. Whitlow-grass. Abundant in old gravel pit in sect. 32, High Lake.

Berteroa incana (L.) DC. Hoary Alyssum. Collected on ballast along M. & St. L. tracks north of Estherville.

Alyssum alyssoides L. Yellow Alyssum. Collected in grassy woods, Oak Hill Cemetery.

Thlaspi arvense L. Penny-Cress. Locally along roadsides.

Lepidium campestre (L.) R. Br. Cow-Cress. Introduced in timothy fields and waste ground in southwest part of Estherville.

Lepidium virginicum L. Poor-Man's Pepper. Dry soil; roadsides.

Lepidium densiflorum Schrad. Along roads and paths and in waste ground.

Capsella bursa-pastoris (L.) Medic. Shepherd's-purse. A weed in yards and waste ground.

Camelina sativa (L.) Crantz. False Flax. In flax fields.

Brassica kaber (DC.) L. C. Wheeler var. *pinnatifida* (Stokes) L. C. Wheeler. Charlock, Crunchweed. In grain fields and roadsides.

Brassica juncea (L.) Coss. Smooth Mustard. Introduced weed.

Brassica nigra (L.) Koch. Black Mustard. Introduced weed.

Diplotaxis muralis (L.) DC. Wall Rocket. Some years ago established in gravelly ground along Rock Island R. R. tracks, south part of Estherville.

Conringia orientalis (L.) Dumort. Hare's-ear-Mustard. Occasionally introduced in farm yards.

Sisimbrium officinale (L.) Scop. var. *leiocarpum* DC. Hedge-Mustard. Common weed in barnyards and pastures.

Sisimbrium altissimum L. Tumble-Mustard. In gravelly soil and on railroad ballast.

Descurainia pinnata (Walt.) Britt. var. *brachycarpa* (Richards.) Fern. Tansy-Mustard. Common on gravelly soil and railroad ballast.

Hesperis matronalis L. Dame's Rocket. Roadside south side of sect. 33, Twelve-mile Lake; waste ground and abandoned gardens, Estherville.

Erysimum cheirantoides L. Wormseed Mustard. Frequent along shady banks.

Erysimum inconspicuum (S. Wats.) MacM. Smaller Prairie-Rocket. On gravel plain between Wallingford and Estherville and on gravel in south part of Estherville.

Rorippa amphibia (L.) Bess. forma *indivisa* (DC.) Reichb. The author first noticed this plant in the summer of 1932, growing along muddy stretches of the Des Moines River in sect. 21, Emmet. During the following years it rapidly spread along the river banks, until it had occupied much of the flood plain above Estherville and also below. In 1932 it had just begun to appear in eastern United States, having first become established along the St. Lawrence River in Canada.

Rorippa prostrata (Bergeret) Schinz & Thell. Like the above, a recent immigrant from Europe. Occurs in dense patches on the flood plain of the Des Moines River north of Estherville.

- Rorippa islandica* (Oeder) Barbas var. *fernaldiana* Butt. & Abbe. Marsh Cress. In wet seasons common in low fields; mud flats.
- Rorippa islandica* var. *hispida* (Desv.) Butt. & Abbe. With the preceding but less common.
- A Armoracia lapathifolia* Gilib. Horseradish. An occasional, but persistent escape from cultivation.
- Barbarea vulgaris* R. Br. Winter-Cress. In sandy soil, Estherville.
- Barbarea vulgaris* var. *arcuata* (Opiz) Fries. Was established along roadside sect. 11, Emmet, many years ago, from where it has spread.
- Dentaria laciniata* Muhl. Pepperroot. Common in woods especially at High Lake. There a slender form with ascending leaves, of which there are six instead of three, and usually alternate, occurs in two different places. The flowers are smaller than in the regular form. This form has not been mentioned in manuals, except that C. C. Deam, in *Flora of Indiana* quoted J. M. Coulter as referring to variations in this species, mentioning forms with two or four leaves, sometimes alternate, but did not mention six.
- Cardamine bulbosa* (Schreb.) BSP. Spring Cress. Along water courses, in springy places and in fens.
- Cardamine pensylvanica* Muhl. Bitter Cress. In wet places along streams and brooks.
- Cardamine parviflora* L. var. *arenicola* (Britt.) O. E. Schulz. Bitter Cress. Frequent in woods and along banks.
- Arabis hirsuta* (L.) Scop. var. *pyncocarpa* (M. Hopkins) Rollins. Hairy Rock-Cress. In woods, along banks, in meadow or prairie.
- Arabis divaricarpa* Nels. Purple Rock-Cress. On sand banks along the southeast side of Tuttle Lake.
- Arabis perstellata* E. L. Br. var. *shortii* Fern. Toothed Rock-Cress. Wooded slopes and banks; orchards and yards.
- Arabis canadensis* L. Sicklepod. In upland woods, Estherville.

CRASSULACEAE

- Sedum purpureum* (L.) Link. Live-forever. Established in a ravine at the edge of Oak Hill Cemetery.

SAXIFRAGACEAE

- Penthorum sedoides* L. Ditch-Stonecrop. In wet places, meadows and ditches.
- Heuchera richardsonii* R. Br. var. *grayana* Rosend. Butt. & Lak. Local on gravelly knolls and hillsides.
- Parnassia glauca* Raf. Grass-of-Parnassus. According to Cratty, "once common on low prairie." Now restricted to fens in Emmet and Estherville townships.
- Ribes cynosbati* L. Prickly Gooseberry. In upland woods at Estherville.
- Ribes missouriensis* Nutt. Common Gooseberry. Common in all woods.
- Ribes americanum* Mill. Wild Black Currant. Common in low open woods, borders of marshes, and in fencerows.
- Ribes odoratum* Wendland. f. Planted and escaped in fencerows on farms, but modern road grading probably has destroyed it.

ROSACEAE

- Spiraea alba* Du Roi. Western Meadow-sweet. Once common on prairie, according to Cratty, but has since become extremely rare. Has been confined to roadsides where it has been destroyed by road grading. There is a station along road through sect. 26, Emmet.
- Pyrus Malus* L. Common Apple. Spread from cultivation. Trees occur in ravines at Estherville, and along open or wooded roadsides.
- Pyrus ioensis* (Wood) Bailey. Wild Crab. Along fringes of woods, along lake banks and streams, sometimes forming thickets. Along top of ravines, Estherville woods, are trees with deeper pink petals.
- Amelanchier alnifolia* Nutt. Juneberry. Along banks of brook, two miles south of Wallingford, sect. 24, Twelve-mile Lake.
- Amelanchier sanguinea* (Pursh.) DC. Specimens sent to Dr. Wiegand in 1930 were considered by him to be "almost identical with our New

- York state forms of *A. sanguinea*." As northern Iowa is included in the range of the species in Gray's Manual, it seems that his determination was retained.
- Amelanchier humilis* Wieg. This includes a large number of forms differing widely in shape and serration of leaves and in size of petals. High woods at Estherville and high lake banks.
- Amelanchier humilis* var. *compacta* Nielson. High woods south of Estherville.
- Amelanchier humilis* var. *exserrata* Nielson. Roadside sect. 3, Emmet; Estherville, high woods.
- Amelanchier arborea* (Michx. f) Fern. Unusual, and few trees are typical. East branch of Des Moines River.
- Amelanchier arborea* (Michx. f) Fern. *X humilis* Weig. Several trees on a high ridge south of Oak Hill Cemetery were thus referred to by Dr. Wiegand. The largest has a diameter of six inches.
- Crataegus punctata* Jacq. Dotted Thornapple. Fairly common in open woods and thickets.
- Crataegus punctata* var. *aurea* Ait. Yellow-fruited Thornapple. Fort Defiance State Park.
- Crataegus chrysoarpa* Ashe. Round-leaved Thornapple. Along east Des Moines River west of Armstrong, banks of Tuttle Lake, and in the upland woods of Fort Defiance State Park. Slightly different material from the south bank of Swan Lake was named *C. pubifolia* Ashe by E. H. Wilson of the Arnold Arboretum. This is not mentioned in Gray.
- Crataegus mollis* (T. & G.) Scheele. Thornapple. In open woods, and often in low pastures around lakes and sloughs.
- Crataegus succulenta* Link. Southwest corner of sect. 10, Estherville; Bur Oak Lake, High Lake.
- Crataegus succulenta* var. *macracantha* (Lodd.) Eglest. Long-spined Thornapple. In the woods of the western part of Estherville, south of Highway 9; south of Estherville, west of Highway 17.
- Crataegus calpodendron* (Ehrh.) Medic. In open upland woods north of Estherville; upland woods south of Estherville.
- Fragaria virginiana* Duchesne. Meadow Strawberry. High Lake.
- Fragaria virginiana* var. *illinoensis* (Prince) Gray. Common.
- Fragaria vesca* L. Woodland Strawberry. Open woods. High Lake, Estherville.
- Fragaria vesca* var. *americana* Porter. Woods south of Estherville.
- Potentilla palustris* (L.) Scop. Marsh Cinquefoil. Recorded by Cratty as rare in bogs in eastern part of the county in early years.
- Potentilla arguta* Pursh. Prairie Cinquefoil. On upland prairie slopes and gravelly knolls.
- Potentilla argentea* L. Silvery Cinquefoil. Introduced in a dry pastured hillside southwest part of Estherville and near Oak Hill; also in the southeast part of Estherville.
- Potentilla recta* L. Introduced in open woods in Fort Defiance State Park. Roadsides, Ellsworth.
- Potentilla paradoxa* Nutt. Bushy Cinquefoil. Sandy shores and beaches.
- Potentilla nicolletii* (S. Wats.) Sheld. Sandy shores. High Lake.
- Potentilla millegrana* Engelm. Shores. Ingham Lake. Estherville.
- Potentilla pentandra* Engelm. Along streams and borders of marshes.
- Potentilla norvegica* L. Roadsides, shores, and waste places.
- Potentilla simplex* Michx. Old-field Cinquefoil. Roadside, Ellsworth; open grassy woods in sect. 15, Estherville. The latter has appressed pubescens.
- Potentilla anserina* L. Silverweed. In 1923 this was growing in a large, recently drained peat bog northwest of Armstrong.
- Geum canadense* Jacq. Avens. Along river north of Estherville; low woods, High Lake.
- Geum canadense* Jacq. var. *camporum* (Rydb.) Fern. Common. Open woods.
- Geum aleppicum* Jacq. var. *strictum* (Ait.) Fern. Yellow Avens. Edge of marshy ground north of Highway 9, sect. 5, Estherville.

- Rubus idaeus* L. var. *aculeatissimus* Regal & Tiling. Wild Red Raspberry. Borders of woods and fence rows.
- Rubus occidentalis* L. Black Raspberry. Borders of woods, thickets, and fence rows. In woods in north part of Estherville, larger-fruited plants are no doubt escapes from cultivated forms.
- Rubus allegheniensis* Porter. Wild Blackberry. Upland woods, slopes and ravines at Estherville. Determined by Dr. Rydberg.
- Agrimonia gryposepala* Wallr. Frequent in woods.
- Agrimonia striata* Michx. On prairie and in open woods and borders. Bristles of fruits irregular in length and close together at base.
- Agrimonia pubescens* Wallr. Hillsides in Estherville woods. Bristles of fruits regular in length and spaced evenly apart at base.
- Rosa eglanteria* L. Sweet Briar, Eglantine. For some time was established in a brushy pasture in sect. 15, Estherville.
- Rosa arkansana* Porter. var. *suffulta* (Greene) Cockerell. Prairie Rose. Abundant along prairie roadsides, and very variable.
- Rosa blanda* Ait. Wood Rose. Borders and roadsides in and near woods.
- Prunus americana* Marsh. Wild Plum. Borders, fence rows and thickets. Fruit varies much in size, shape, and flavor.
- Prunus americana* var. *lanata* Sudw. Borders. Near Oak Hill Cemetery.
- Prunus pennsylvanica* L. f. Bird- or Pin-Cherry. Upland woods and borders, south and west of Estherville, and farther south along the hills.
- Prunus serotina* Ehrh. Black-Cherry. Very rare at High Lake; most, or all of larger trees west of Estherville are gone.
- Prunus virginiana* L. Choke-Cherry. Borders and thickets.

LEGUMINOSAE

- Desmanthus illinoensis* (Michx.) MacM. Prairie-Mimosa. Has been common in years of droughts along dry shores of our lakes. High, Tuttle, and Eagle lakes. For some years lakes have been full and it has been absent except at Eagle Lake.
- Gymnocladus dioica* (L.) Koch. Kentucky Coffee-tree. Some years ago there were large trees at the east end of High Lake; others on island and on south side of Ingham Lake; on peninsula in Cunningham slough, where most trees were cut, resulting in dense second growth. There have been three trees on School Section Creek in Estherville.
- Cassia fasciculata* Michx. Partridge-Pea. On sandy or gravelly soil, especially where moist and springy.
- Baptisia leucophaea* Nutt. Wild Indigo. Prairie hillsides in the eastern part of the county.
- Trifolium pratense* L. var. *sativum* (Mill.) Schreb. Red Clover. Roadsides.
- Trifolium repens* L. White Clover. Pastures and roadsides.
- Trifolium hybridum* L. var. *elegans* (Savi.) Boiss. Alsike Clover. Roadsides.
- Trifolium procumbens* L. Low Hop-Clover. Pastures and waste ground.
- Melilotus officinalis* (L.) Lam. Yellow Sweet Clover. Roadsides.
- Melilotus alba* Desr. White Sweet Clover. Roadsides, waste ground.
- Medicago sativa* L. Alfalfa. Persistent along roadsides.
- Medicago lupulina* L. var. *glandulosa* Neilr. Black Medick. Roadsides, waste ground, and pastures.
- Psoralea argophylla* Pursh. Silvery-leaved Psoralea. Common on upland prairie.
- Psoralea esculenta* Pursh. Breadroot, Pomme de Prairie. Infrequent on high prairie and knolls.
- Amorpha canescens* Pursh. Leadplant. One of the dominant plants on some types of upland prairie.
- Amorpha nana* Nutt. Dwarf False Indigo. In the eastern part of the county but now very rare. Northwest corner of sect. 36, Jack Creek. Armstrong (Cratty).
- Amorpha fruticosa* L. False Indigo. Typical form rare. Banks of High Lake.
- Amorpha fruticosa* var. *angustifolia* Pursh. The common form. Low banks of lakes and marshes.

- Petalostemum candidum* (Willd.) Michx. White Prairie-Clover. Frequent on dry prairie.
- Petalostemum purpureum* (Vent.) Rydb. Purple Prairie-Clover. One of the typical dry prairie plants.
- Robinia pseudo-acacia* L. Black Locust. Planted along road banks in Fort Defiance State Park and spread there and escaped to other areas.
- Astragalus canadensis* L. Milk Vetch. Prairie knolls, banks and borders.
- Astragalus goniatus* Nutt. Purple Milk Vetch. There was once a patch in a high prairie pasture in sect. 28, Emmet.
- Astragalus caryocarpus* Ker. Ground Plum. On prairie knolls and hillsides.
- Oxytropis lambertii* Pursh. Stemless Locoweed. Rare on knolls and hillsides in sections 29 and 30 in Emmet Tp.
- Glycyrrhiza lepidota* (Nutt.) Pursh. Licorice. On upland or sandy prairie.
- Desmodium glutinosum* (Muhl.) Wood. Large-leaved Tick-trefoil. Abundant in woods at High Lake and common throughout.
- Desmodium illinoense* Gray. Rare. Hillside in state park woods.
- Desmodium canadense* (L.) DC. Showy Tick-trefoil. Common along roadsides, fencerows, and borders of woods.
- Desmodium cuspidatum* (Muhl.) Loud. var. *longifolium* (T. & G.) Schub. Long-leaved Tick-trefoil. Along a border and a roadside in the High Lake woods; in rather open woods at Estherville.
- Desmodium perplexum* Schub. In dry open woods at Estherville; once common in uncleared areas of Oak Hill Cemetery.
- Lespedeza capitata* Michx. Tall Bush-Clover. Frequent on upland prairie.
- Lespedeza leptostachya* Engelm. Prairie Bush-Clover. Dry prairie hillsides and knolls.
- Vicia americana* Muhl. Vetch. Common. Prairie, grassy knolls and banks.
- Vicia americana* var. *truncata* (Nutt.) Brewer. Roadside, south side of sect. 15, Ellsworth.
- Lathyrus palustris* L. var. *linearifolius* Ser. Vetchling. In low meadows and grassland.
- Lathyrus venosus* Muhl. var. *intonsus* Butt. & St. John. Veiny Pea. Open woods, borders, and prairie.
- Lathyrus ochroleucus* Hook. Cream-colored Vetchling. Common in upland woods south and west of Estherville.
- Apios americana* Medic. Groundnut. Wild Bean. Infrequent along low banks, borders of marshes and around springy places.
- Strophostyles helvola* (L.) Ell. Trailing Wild Bean. Infrequent. Shores of lakes and along river banks.
- Strophostyles leiosperma* (T. & G.) Piper Small Wild Bean. Infrequent. Shores and banks of lakes and rivers.
- Amphicarpa bracteata* (L.) Fern. Hog-Peanut. Very common, woods and shady slopes.
- Amphicarpa bracteata* var. *comosa* (L.) Fern. Coarser and more hirsute. In rich open ground, fencerows and roadside ditches. Northwest corner of sect. 12, Emmet.

LINACEAE

- Linum usitatissimum* L. Flax. Roadsides and sometimes waste places but hardly persists.
- Linum sulcatum* Riddell. Grooved Yellow Flax. On dry prairie.

OXALIDACEAE

- Oxalis violacea* Raf. Violet Wood-Sorrel. In dry or gravelly soil; often at the edges of fields.
- Oxalis corniculata* L. Creeping Wood-Sorrel. A weed around greenhouses.
- Oxalis stricta* L. Yellow Wood-Sorrel. A common weed in gardens among perennials and in lawns. Ours is largely the var. *piletocarpa* Wieg. which is not recognized in Gray.
- Oxalis florida* Salisb. On dry prairie, southwest corner of the county.
- Oxalis europaea* Jord. Dry woods east side of Cheever Lake and other locations. Some material is forma *pilosella* Wieg.

GERANIACEAE

- Geranium maculatum* L. Wild Cranesbill. Local. High Lake woods and in Fort Defiance State Park.
Geranium Bicknellii Britt. Was once frequent on slopes of ravines around Oak Hill Cemetery at Estherville.

ZYGOPHYLLACEAE

- Tribulus terrestris* L. Caltrop. On dump in Estherville.

RUTACEAE

- Xanthoxylum americanum* Mill. Prickly Ash. Common in woods, often forming dense thickets.

POLYGALACEAE

- Polygala incarnata* L. Collected once by Cratty near Armstrong.
Polygala sanguinea L. Also collected by Cratty near Armstrong.
Polygala verticillata L. var. *isocycle* Fern. Whorled Milkwort. Grows both on hillsides and on moist prairie.

EUPHORBIACEAE

- Acalypha rhomboidea* Raf. Three-seeded Mercury. Moist open woods, often around springs.
Acalypha virginica L. In rather dry open woods and yards.
Euphorbia dentata Michx. Has become established on a dry hillside in the north part of Estherville.
Euphorbia cyperissias L. Cypress Spurge. Escaped from cemeteries to roadsides.
Euphorbia corollata L. Flowering Spurge. On gravelly soil along the Des Moines River plain in the south part of High Lake.
Euphorbia supina Raf. Milk-purslane. In dry soil, roadsides and pastures.
Euphorbia maculata L. Eyebane. In dry fields and sandy soil.
Euphorbia serpyllifolia Pers. Thyme-leaved Spurge. In dry ground.
Euphorbia glyptosperma Engelm. In dry or cultivated ground.

CALLITRICHACEAE

- Callitriche palustris* L. Water-Starwort. Generally rare, but a few years ago was very abundant in a brook running from springy ground in sect. 24, Estherville Tp. to the Des Moines River.

ANACARDIACEAE

- Rhus typhina* L. Staghorn-Sumach. Rare. On a high bank in woods south side of Iowa Lake; southeast of Armstrong on east fork of Des Moines River (Cratty).
Rhus glabra L. Smooth Sumach. Roadside banks, borders, and slopes.
Rhus radicans L. var. *vulgaris* (Michx.) DC. forma *negundo* (Greene) Fern. Climbing Poison Ivy. Rare. Bank of Des Moines River, south of Estherville; bank of Ingham Lake, southeast side.
Rhus radicans L. var. *rydbergii* (Small) Rehd. Bushy Poison Ivy. Common; woods, banks, borders, and roadsides.

CELASTRACEAE

- Euonymus atropurpureus* Jacq. Wahoo. Estherville and High Lake woods.
Celastrus scandens L. Climbing Bittersweet. No longer common. In open brushy woods.

STAPHYLEACEAE

- Staphylea trifolia* L. Bladdernut. In wooded valleys in the west part of Estherville; on island in Swan Lake.

ACERACEAE

- Acer saccharum* Marsh. Sugar Maple. Rare. Upland woods north of Estherville; riverbank south of Estherville, near Highway 17. Only a few trees are typical *saccharum*.
- Acer nigrum* Michx. Black Sugar Maple. Common in woods at Estherville, Emmet Grove, Ingham Lake, and Iowa Lake. There are various leaf forms.
- Acer saccharinum* L. Soft Maple. Common along the east and west branches of the Des Moines River.
- Acer negundo* L. Box-Elder. Low woods and along streams.

BALSAMINACEAE

- Impatiens pallida* Nutt. Pale Touch-me-not. Abundant in rich woods at High Lake and other places.
- Impatiens capensis* Meerb. (*I. biflora* Walt.) Spotted Touch-me-not. Common around springy places in woods, and in open ground in fens and edges of marshes.

RHAMNACEAE

- Rhamnus cathartica* L. Buckthorn. Escaped into high woods west and south of Estherville.
- Ceanothus americana* L. var. *pitcheri* T. & G. New Jersey Tea. Frequent on dry prairie, and on open, grassy ridges in woods.

VITACEAE

- Parthenocissus quinquefolia* (L.) Planch. forma *hirsuta* (Don.) Fern. Virginia Creeper. In open woods at Estherville.
- Parthenocissus inserta* (Kerner) K. Fritsch. The common species. Open woods, thickets, and along fences in the open country.
- Vitis riparia* Michx. Wild Grape. Common in woods and along banks and fences.

TILIACEAE

- Tilia americana* L. Basswood. One of the common trees in most woods.

MALVACEAE

- Malva sylvestris* L. Tall Mallow. Sometimes persists around farm yards.
- Malva neglecta* Wallr. Mallow, Cheeses. Common in barnyards, along roadsides, and in back alleys in towns.
- Malva parviflora* L. In similar situations. On banks of drainage ditch in Ellsworth.
- Abutilon theophrasti* Medic. Velvet-leaf. A weed in barnyards and in fields.
- Hibiscus trionum* L. Flower-of-an hour. An introduced weed in fields.

GUTTIFERAE

- Hypericum pyramidatum* Ait. Great St. John's-wort. Rare and local. Along the Des Moines River, sect. 28, Emmet.
- Hypericum canadense* L. St. John's-wort. Very rare in wet ground at High Lake; Armstrong (Cratty).
- Hypericum virginicum* L. Marsh. St. John's-wort. Recorded by Cratty.

CISTACEAE

- Helianthemum bicknellii* Fern. Frostweed. On gravelly knolls in Emmet; on grassy ridges and open places in Estherville woods; High Lake.

VIOLACEAE

- Viola cucullata* Ait. A specimen with long slender, acute cleistogamous flowers, collected along M. & St. L. tracks in the north part of Estherville, was sent to Dr. W. A. Anderson in 1943. Dr. Anderson stated: "I can make nothing of it but *V. cucullata*." I have not since found any more material like it.

- Viola papilionacea* Pursh. Meadow Violet. In open ground, grassland, roadside ditches, and in sunny situations about dwellings.
- Viola papilionacea* Pursh. X *V. pedatifida* Don. Common on prairie, especially along railroads.
- Viola missouriensis* Greene. Yards, roadsides, railroad ballast, and sandy bottoms along streams. The writer has not been able to separate *Viola lucidifolia* Newbro from this by any constant character in our area.
- Viola nephrophylla* Greene. Bog Violet. The common violet in fens in Emmet and Estherville townships.
- Viola sororia* Willd. Hairy Blue Violet. Wood Violet. Abundant in woods, orchards and shaded yards.
- Viola septentrionalis* Greene. Northern Blue Violet. In open woods.
- Viola pedatifida* G. Don. Prairie Violet. Common on dry prairie.
- Viola pedatifida* G. Don. X *V. sororia* Willd. In grassy places in open woods.
- Viola pubescens* Ait. var. *peckii* House. Downy Yellow Violet. Not common and intergrades with the following.
- Viola pennsylvanica* Michx. var. *leiocarpa* (Fern. & Wieg.) Fern. Smoother Yellow Violet. Abundant in woods.
- Viola rugulosa* Greene. White Violet. At one time abundant on a tiny island in a pond north of High Lake; in woods near the west end of Swan Lake; banks of brook in sect. 6, High Lake, where it still grows; in woods in the north part of Estherville, where it has escaped from cultivation. In his former list the author called attention to our white violet as being this species rather than *V. canadensis* L. as it had been called by Iowa botanists.

ELEAGNACEAE

- Shepherdia argentea* Nutt. Buffalo-berry. At Estherville, on high hill by stand pipe, and in a nearby location where it has formed a dense growth in an opening in the woods. The most eastern known distribution in Iowa.

LYTHRACEAE

- Lythrum alatum* Pursh. Loosestrife. In wet ground, prairie, and ditches.

ONOGRACEAE

- Ludwigia polycarpa* Short & Peter. Rare. High Lake and Armstrong.
- Epilobium angustifolium* L. Great Willowherb. Fireweed. Recorded by Cratty as follows: "Collected but once in low ground one mile north-east of Armstrong."
- Epilobium leptophyllum* Raf. Narrow-leaved Willowherb. Infrequent in marshes.
- Epilobium coloratum* Biehler. Purple-leaved Willowherb. Frequent in marshes.
- Epilobium glandulosum* Lehm. var. *adenocaulon* (Hausk.) Fern. Northern Willowherb. In wet ground; less common.
- Oenothera biennis* L. Evening Primrose. A common weed.
- Oenothera biennis* var. *pycnocarpa* (Atkinson & Bartlett) Wieg. Common weed.
- Oenothera serrulata* Nutt. Tooth-leaved Primrose. Frequent on dry prairie.
- Gaura biennis* L. Roadside sect. 7, Estherville; sect. 22, High Lake.
- Circaea quadrifida* (Maxim.) Franch. & Sav. var. *canadensis* (L.) Hara. Enchanter's Nightshade. Common in woods.

HALORAGACEAE

- Myriophyllum exalbescens* Fern. Water-Milfoil. In ponds and sloughs.
- Myriophyllum heterophyllum* Michx. Recorded by Cratty from ponds.

ARALIACEAE

- Aralia racemosa* L. Spikenard. In rich woods, often on decayed logs and stumps. Known for its spicy-aromatic roots.
- Aralia nudicaulis* L. Wild Sarsaparilla. Along wooded banks and slopes.
- Panax quinquefolium* L. Ginseng. Once common in rich woods.

UMBELLIFERAE

- Sanicula marilandica* L. Sanicle. Common in more open woods.
Sanicula gregaria Bickn. Clustered Sanicle. Abundant in woods.
Sanicula canadensis L. Short-styled Sanicle. Common in woods. A form once common in High Lake woods had long styles, much longer than bristles of fruit.
Eryngium yuccifolium Michx. Rattlesnake-master, Button-Snakeroot. On low virgin prairie, persisting along roadsides.
Osmorhiza claytoni (Michx.) C. B. Clarke. Woolly Sweet Cicily. Common in woods.
Osmorhiza longistylis (Torr.) DC. Smooth Sweet Cicily. Anise-root. Common in woods.
Osmorhiza longistylis var. *villicaulis* Fern. In High Lake woods.
Zizia aptera (Gray) Fern. Heart-leaved Alexanders. Local but frequent on light prairie soil in the northern tier of townships
Zizia aurea (L.) W. D. J. Koch. Golden Alexanders. Common, meadows and borders.
Cicuta bulbifera L. Bulb-bearing Water-Hemlock. Local in marshes in the Ingham and High Lake area, Four-mile Lake, and in the eastern part of the county.
Cicuta maculata L. Water-Hemlock. Common on low prairie and in marshy areas.
Cryptotaenia canadensis (L.) DC. Honewort. Common in woods.
Carum carvi L. Caraway. Escaped from gardens to roadsides.
Taenidia integerrima L. Drude. Yellow Pimpernel. Mostly along high banks and in upland woods.
Sium suave Walt. Water-parsnip. Frequent in marshes and on mud.
Berula pusilla (Nutt.) Fern. Water-parsnip. Very rare. In a shaded brook on bank of Des Moines River, sect. 16, Emmet. Brook since dried and station destroyed.
Thaspium barbinode (Michx.) Nutt. Meadow-parsnip. Open woods, borders, and low meadows.
Conioselinum chinense (L.) BSP. Hemlock-parsley. Cratty reported a specimen collected in Estherville woods by T. J. Fitzpatrick in 1903.
Lomatium orientale C. & R. White-flowered Parsley. Rare. High banks of Des Moines River, sect. 14, Estherville; gravelly hills and slopes sect. 28, Emmet.
Pastinaca sativa L. Parsnip. Escaped and a roadside weed.
Heraclaeum maximum Bartr. Cow Parsnip. In low woods. High Lake, Estherville.
Daucus carota L. Wild Carrot, Queen Anne's-Lace. Introduced weed along roadsides. Abundant in hilly areas in western part of county.

CORNACEAE

- Cornus stolonifera* Michx. Red Osier Dogwood. Low borders, edges of marshes, and along fences in low ground. High Lake, Tuttle Lake.
Cornus rugosa Lam. Round-leaved Dogwood. Frequent in Estherville woods; rare, along East Des Moines River.
Cornus drummondii Meyer. Rough-leaved Dogwood. Iowa Lake and Armstrong Grove (Cratty).
Cornus obliqua Raf. Silky Dogwood. Kinnikinnik. In marshy woods and borders at Ingham Lake. Estherville. Young stems beautiful reddish-purple in spring.
Cornus racemosa Lam. Panicked Dogwood. Once formed an almost impenetrable brush in cut-over woods at High Lake.
Cornus alternifolia L. f. Alternate-leaved Dogwood. Green Osier. In Estherville woods and along east Des Moines River. A beautiful ornamental shrub.

PYROLACEAE

- Pyrola secunda* L. One-sided Wintergreen. Very rare. In woods southwest of Estherville.

Pyrola elliptica Nutt. Shinleaf. Local along slopes and ridges of Estherville woods; a station at High Lake long since destroyed.

PRIMULACEAE

Lysimachia thyrsoflora L. Tufted Loosestrife. In marshes.

Lysimachia ciliata L. Fringed Loosestrife. Common.

Lysimachia lanceolata Walt. Recorded by Cratty as rare in low ground.

Lysimachia quadriflora Sims. On low prairie. Common in fens.

OLEACEAE

Fraxinus pennsylvanica Marsh. var. *austini* Fern. Red Ash. Infrequent. Mostly near lake and river banks. High, Tuttle, and Swan lakes, Estherville.

Fraxinus pennsylvanica Marsh. var. *subintegerrima* (Vahl.) Fern. Green Ash. Our common ash. Woods and banks.

Fraxinus nigra Marsh. Black Ash. There was originally an almost solid stand of this ash in the boggy ground around a spring north of Estherville, in sect. 2, Estherville. A number of trees remain.

GENTIANACEAE

Gentiana crinita Froel. Fringed Gentian. Has been infrequent in springy ground in the Estherville vicinity. In old gravel pit bottom south part of Estherville; in a boggy roadside between section 24 and 25 Estherville; along M. & St. L. R. R. right-of way one and one-half miles north of Estherville; in fen west side of river in sect. 3, Estherville. It has become extremely rare at the present time.

Gentiana procera Holm. Smaller Fringed Gentian. Frequent in fens in Emmet and Estherville townships.

Gentiana quinquefolia L. var. *occidentalis* (Gray) Hitchc. Collected by Cratty "in woods near Estherville."

Gentiana puberula Michx. Prairie Gentian. Infrequent on the few spots of dry prairie still left, blooming in late September.

Gentiana andrewsii Grieseb. Closed Gentian. Low prairie, and in marshy borders of woods and thickets.

Menyanthes trifoliata L. var. *minor* Raf. Buckbean. Reported by Cratty as frequent in bogs in the eastern part of the county. Was common in a marsh in sections 22 and 29 in High Lake about 1930.

APOCYNACEAE

Apocynum androsaemifolium L. Spreading Dogbane. In open woods and along roadside banks in woods.

Apocynum cannabinum L. Indian Hemp. Borders of marshes, ditches and low open ground.

Apocynum sibiricum Jacq. The most common species. Abundant around borders of marshes and along low roadsides.

Apocynum sibiricum var. *cordigerum* (Greene) Fern. Rare. North side of High Lake Cemetery.

ASCLEPIADACEAE

Asclepias tuberosa L. Butterflyweed. Pleurisy-root. In dry and especially sandy prairie.

Asclepias incarnata L. Swamp-Milkweed. Around borders of marshes, sloughs, and springy places.

Asclepias sullivantii Engelm. Mostly in virgin prairie soil.

Asclepias ovalifolia Dene. Rare. On prairie; sometimes near woods.

Asclepias syriaca L. Common Milkweed. A weed in fields and pastures.

Asclepias speciosa Torr. Showy Milkweed. Along low prairie roadsides; moist soil bordering marshes and sloughs.

Asclepias verticillata L. Whorled Milkweed. Common on dry prairie, roadsides, pastures and oak woods.

Asclepias viridiflora Raf. (*Acerates* Eaton) Green Milkweed. On dry prairie, Emmet. The typical form is rare here.

- Asclepias viridiflora* var. *lanceolata* (Ives) Torr. More common. Dry prairie, open woods and ridges. A specimen from a ridge in Estherville woods has peduncles $3\frac{1}{2}$ cm. long. Some very narrow-leaved plants are near var. *linearis* (Gray) Fern.
- Asclepias lanuginosa* Nutt. Woolly Milkweed. Rare. Dry prairie, High Lake. Ellsworth.

CONVOLVULACEAE

- Ipomoea hederacea* (L.) Jacq. Ivy-leaved Morning-glory. In waste ground, Estherville.
- Ipomoea purpurea* (L.) Roth. Common Morning-glory. In cultivated or waste ground; river bank, Estherville.
- Convolvulus sepium* L. Wild Morning-glory. A weed in fields.
- Convolvulus arvensis* L. Field-Bindweed. A weed along railroad tracks and some roadsides.
- Cuscuta polygonorum* Engelm. High Lake.
- Cuscuta cephalanthi* Engelm. High Lake; Iowa Lake (Cratty).
- Cuscuta pentagona* Engelm. High Lake; Armstrong (Cratty).
- Cuscuta coryli* Engelm. On *Solidago*, Estherville.
- Cuscuta gronovii* Willd. In wet shady ground, High Lake, Estherville.
- Cuscuta glomerata* Choisy. Common on tall herbs.
- Cuscuta megalocarpa* Rydb. On *Rudbeckia laciniata* and other tall herbs, along river, Estherville. Also L. H. Pammel.

POLEMONIACEAE

- Collomia linearis* Nutt. Common along railroad tracks.
- Phlox divaricata* L. var. *laphamii* Wood. Blue Wood Phlox. Common in woods.
- Phlox pilosa* L. var. *fulgida* Wherry. Prairie Phlox. Common along prairie roadsides and railway right-of-way, especially between Estherville and Superior.

HYDROPHYLLACEAE

- Hydrophyllum virginicum* L. Waterleaf. Abundant in rich woods.
- Ellisia nyctelia* L. In low woods; shady or cultivated ground near dwellings.

BORAGINACEAE

- Onosmodium occidentale* Mackenz. Western False Gromwell. Frequent on dry prairie.
- Lithospermum latifolium* Michx. American Gromwell. Common in woods, High Lake.
- Lithospermum incisum* Lehm. Narrow-leaved Puccoon. In sandy or gravelly soil. Prominent on the Des Moines River gravel plain.
- Lithospermum canescens* (Michx.) Lehm. Hoary Puccoon. Common on upland prairie or gravel.
- Cynoglossum officinale* L. Common Hound's-tongue. Introduced in a hilly pasture and adjoining roadside, sect. 33, Emmet.
- Lappula echinata* Gilib. Stickseed. Common in dry waste ground and pastures.
- Lappula redowskii* (Hornem.) Greene var. *occidentalis* (Wats.) Rydb. Common in dry pastures.
- Hackelia virginiana* (L.) I. M. Johnston. Stickseed. Beggar's-Lice. Very common in woods.

VERBENACEAE

- Verbena urticifolia* L. White Vervain. In low pastures and on flood plains. Common.
- Verbena hastata* L. Blue Vervain. Common in low pastures.
- Verbena stricta* Vent. Hoary Vervain. Abundant in upland or hilly pastures. Forma *roseiflora* Banks, with rose-colored flowers, and forma *albiflora* Wadmond, with white flowers, occur.
- Verbena bracteata* Lag. & Rodr. Prostrate Vervain. In dry barnyards, tramped ground, and pastures.

Lippia lanceolata Michx. var. *recognita* Fern. & Grisc. Fog-fruit. Along shores of lakes. Has become frequent in recent years.

LABIATAE

Teucrium canadense L. var. *virginicum* (L.) Eat. Wood-sage. Frequent in low open woods or open ground.

Teucrium occidentale Gray. var. *boreale* (Bickn.) Fern. Hairy Germander. Around the borders of marshes and in other moist ground.

Scutellaria lateriflora L. Mad-dog Scullcap. Swampy margins of marshes, sloughs, and around springs.

Scutellaria epilobiifolia A. Hamilton. Marsh Scullcap. Wet meadows and shores.

Scutellaria parvula Michx. var. *leonardi* (Epling) Fern. Small Scullcap. On low prairie and on moist, gravelly hillsides.

Agastache nepetoides (L.) Ktze. Yellow Giant Hyssop. Along border of slough, south side of Ingham Lake; also in woods north of Estherville.

Agastache foeniculum (Pursh.) Ktze. Fragrant Giant Hyssop. Dry open woods and hillsides. Two miles north of Estherville (Station destroyed); outside of entrance to Fort Defiance State Park.

Agastache scrophulariaefolia (Willd.) Ktze. Giant Hyssop. Common along borders and wooded roadsides.

Nepeta cataria L. Catnip. Weed in waste ground, farm groves, yards.

Glechoma hederacea L. Ground Ivy. Established and locally abundant in Estherville woods.

Glechoma hederacea L. var. *micrantha* Moricand. Introduced in yards since pioneer times; escaped into damp, deep woods, Estherville.

Dracocephalum parviflorum Nutt. Dragonhead. In cultivated ground, near woods at Estherville.

Prunella vulgaris L. Selfheal. Introduced in low pastures and low open woods.

Physostegia virginiana (L.) Benth. var. *speciosa* (Sweet) Gray. False Dragonhead. In swampy woods near Ingham Lake; has become abundant on floodplain of the Des Moines River.

Leonorus cardiaca L. Motherwort. An introduced weed in farm groves and in woods near dwellings.

Stachys palustris L. var. *pilosa* (Nutt.) Fern. Hedge-Nettle. In moist depression on pastured hills in western Emmet Tp.

Stachys palustris var. *nipigonensis* Jennings. Roadside, sect. 15, Ellsworth; flood plain Des Moines River.

Stachys palustris var. *homotricha* Fern. The most common form. In low or wet ground. On prairie sometimes very slender and small-leaved.

Stachys palustris var. *phaneropoda* Weath. A form with petioled leaves. Weatherby probably based this variety, at least partly, on Estherville material sent him in 1928.

Salvia reflexa Hornem. Sage. A barnyard and pasture weed in many parts of the county.

Salvia sylvestris L. Established in and around the Wallingford gravel pit.

Monarda fistulosa L. var. *mollis* (L.) Benth. Wild Bergamot. Open woods, prairie pastures, and roadsides.

Hedeoma hispida Pursh. Rough Pennyroyal. Dry pastures and fields.

Pycnanthemum virginianum (L.) D. & J. Mountain-Mint. Common in low prairie pastures, borders of fens, and on gravel.

Lycopus virginicus L. Bugleweed. In wet ground.

Lycopus uniflorus Michx. In wet ground.

Lycopus americanus Muhl. Water-Horehound. Common in marshy or wet ground.

Lycopus rubellus Moench. In wet places on the floodplain of the Des Moines River.

Lycopus asper Greene. Bugleweed. In wet ground; floodplains.

Mentha gentilis L. Creeping Mint. Established on a farm grove in Center Tp.; in waste ground in Estherville.

Mentha arvensis L. forma *glabra* (Benth.) S. R. Stewart. Wild Mint. Along river floodplain, Estherville.

Mentha arvensis L. var. *villosa* (Benth.) S. R. Stewart. Common in low ground. Forma *glabrata* (Benth.) S. R. Stewart, in fens, sect. 21, Emmet.

SOLANACEAE

Solanum americanum: Mill. Black Nightshade. Dry open woods and waste ground. Native.

Solanum nigrum L. Black Nightshade. Waste places, disturbed soil, gardens; naturalized.

Solanum carolinense L. Horse-nettle. Low ground, High Lake; roadside west of Fourth Street bridge, Estherville.

Solanum rostratum Dunal. Buffalo-bur. Introduced from the plains. Barnyards and hog pastures.

Physalis pubescens L. Ground Cherry. Escaped to waste ground.

Physalis ixocarpa Brothero. Tomatillo. As a weed in a sandy field on river valley, southwest of Estherville.

Physalis subglabrata Mackenz. & Bush. Smooth Ground-cherry. Rather common, prairie and prairie roadsides.

Physalis macrophysa Rydb. Some years ago frequent in cultivated ground in the southwest part of Estherville.

Physalis lanceolata Michx. On prairie. Recorded by Cratty.

Physalis virginiana Mill. The common Ground-cherry of the dry prairie. A form collected in Emmet Tp., has the fruiting calyx much longer than normal, up to 5 cm. long. Regarding this C. A. Weatherby wrote in 1929: "I cannot find anything here to match the very long fruit in your specimen."

Physalis heterophylla Nees. var. *ambigua* (Gray) Rydb. Clammy Ground-cherry. A weed in cultivated ground.

Lycium halimifolium Mill. Matrimony-vine. Occasionally escaped to roadsides, and to vacant areas in towns.

Datura stramonium L. Jimsonweed. Used to grow in pastures near Iowa Lake. Introduced.

SCROPHULARIACEAE

Verbascum thapsus L. Mullein. An introduced weed in dry pastures.

Verbascum blattaria L. Moth-Mullein. In 1937 began to appear in a meadow at High Lake.

Linaria vulgaris Hill. Butter-and-eggs. Introduced and often established in farmyards.

Scrophularia lanceolata Pursh. Figwort. In open woods.

Scrophularia marilandica L. Figwort. Mostly in open woods.

Mimulus ringens L. Monkey-flower. Frequent in wet or muddy places. River floodplains.

Mimulus glabratus HBK. var. *fremontii* (Benth.) Grant. Yellow Monkey-flower. Rare. Found only in a quiet brook sect. 28, Emmet.

Gratiola neglecta Torr. Clammy Hedge-hyssup. In muddy ground in wet years.

Lindernia dubia (L.) Pennel. False Pimpernel. In wet, muddy ground, High Lake woods; floodplain of Des Moines River.

Wulfenia bullii (Eat.) Barnh. (*Syntheris* Heller). Kitten Tails. On dry hillsides and oak knolls west side of Des Moines River in sections 28 and 33, and on the east side in sect. 34, in Emmet Tp.

Veronicastrum virginicum (L.) Farw. Culver's-root. Open woods, borders, low prairie, and roadsides.

Veronica comosa Richter. Water-Speedwell. Brooks and ditches. In running water.

Gerardia aspera Dougl. Purple Gerardia. Infrequent on prairie ridges along the Des Moines River. High Lake and Emmet.

Gerardia paupercula (Gray) Britt. Frequent in fens in Emmet Tp.; Armstrong (Cratty).

Gerardia tenuifolia Vahl. var. *macrophylla* Benth. Slender Gerardia. In moist ground; along sandy shores, and in dry years, along receding beaches.

Gerardia auriculata Michx. Auricled Gerardia. Infrequent and local on low prairie, High Lake and Emmet; sect. 25, Lincoln; on sandy bottom of Ryan Lake (Drained.)

Castilleja sessiliflora Pursh. Downy Painted-cup. On dry prairie hillsides and knolls.

Pedicularis lanceolata Michx. Swamp Lousewort. Low or marshy prairie and borders.

Pedicularis canadensis L. Wood-betony. On low peaty prairie; north hillsides in Estherville woods.

OROBANCHACEAE

Orobanche uniflora L. One-flowered Broom-rape. Very rare. Southeast bank of High Lake, May 1910; High Lake woods, May 1909 and May 1921. "North shore of Weller Lake, Armstrong," Cratty.

LENTIBULARIACEAE

Utricularia vulgaris L. Greater Bladderwort. Abundant in shallow ponds and sloughs.

Utricularia minor L. "Very rare in marsh northeast of Armstrong," Cratty.

Utricularia intermedia Hayne. "Rare in marsh east of Armstrong," Cratty.

PHRYMACEAE

Phryma leptostachya L. Lopseed. Frequent in woods.

PLANTAGINACEAE

Plantago major L. Common weed, yards and roadsides.

Plantago rugelii Dcne. With the preceding.

Plantago lanceolata L. Ribgrass. Introduced with clover and timothy seed.

Plantago aristata Michx. In abandoned gravel pit, sect. 32, High Lake.

Plantago purshii R. & S. Abundant on gravel plain and gravel knolls along the Des Moines River, through the county.

RUBIACEAE

Galium aparine L. Cleavers. Cling-rascal. Abundant in low woods.

Galium triflorum Michx. Sweet-scented Bedstraw. Common in woods.

Galium boreale L. var. *intermedium* DC. Northern Bedstraw. The common form. Prairie, open woods, and banks.

Galium boreale L. var. *hyssoifolium* (Hoff.) DC. Open woods near Oak Hill Cemetery.

Galium trifidum L. On marshy prairie, High Lake; in fens, Emmet.

Galium obtusum Bigel. Low prairie; marshy openings in woods.

Galium concinnum T. & G. Shining Bedstraw. In Estherville woods.

CAPRIFOLIACEAE

Diervilla lonicera Mill. Bush-Honeysuckle. Rare on steep hillsides in Estherville woods, north and south of Oak Hill Cemetery and in the State Park.

Lonicera tatarica L. Tartarian Honeysuckle. Established in open woods around Estherville.

Lonicera dioica L. Honeysuckle. In woods and along banks.

Lonicera dioica L. var. *glaucescens* (Rydb.) Butters. In woods and along banks. Swan Lake.

Symphoricarpus occidentalis Hook. Wolfberry. Common. Open woods, pastured hillsides, and prairie knolls. A form along the south side of Tuttle Lake has smaller leaves and flowers and a bearded style.

Triosteum perfoliatum L. Wild Coffee. Horse-gentian. Infrequent in woods.

Virburnum lentago L. Black Haw. Nannyberry. Along banks, and borders of woods.

Virburnum rafinesquianum Schultes. Downy Arrow-wood. In open, upland woods, west and south of Estherville.

Virburnum rafinesquianum var. *affine* (Bush). House. In upland woods at Estherville.

Sambucus canadensis L. Elderberry. Open woods, along fencerows near woods and on prairie.

CUCURBITACEAE

Sicyos angulatus L. Bur-Cucumber. Along low river banks north of Estherville.

Echinocystis lobata (Michx.) T. & G. Wild Cucumber. In low woods and thickets and abundant along low river banks.

CAMPANULACEAE

Specularia perfoliata (L.) A. DC. Venus's Looking-glass. Infrequent in open woods in the vicinity of Oak Hill Cemetery, Estherville.

Campanula rapunculoides L. European Bellflower. Escaped along roadsides and near cemeteries.

Campanula americana L. Tall Bellflower. On slopes and in low ground in woods.

Campanula aparinoides Pursh. Bedstraw Bellflower. Around springy places in the Estherville vicinity; marshes, eastern part of county (Cratty).

Campanula uliginosa Rydb. Marsh Bellflower. Along borders of sloughs. North side of High Lake, and southeast side of Ingham Lake.

Lobelia siphilitica L. Great Lobelia. Around marshes and along low borders of woods.

Lobelia spicata Lam. Spiked Lobelia. On low prairie.

Lobelia spicata var. *hirtella* Gray. On low prairie and sometimes on higher ground.

Lobelia inflata L. Indian-tobacco. Local in upland woods south of Estherville.

Lobelia kalmii L. Brook Lobelia. Common in wet fens in Emmet Tp., and more rare in a fen southeast of Estherville.

COMPOSITAE

Vernonia fasciculata Michx. Ironweed. Low prairie, river bottoms, and pastures.

Eupatorium maculatum L. Joe-Pye-weed. In fens, and wet ground around springs, usually in the open. One form is *E. Bruneri* A. Gray, which is not mentioned in Gray.

Eupatorium purpureum L. In low or dry woods. The author is unable to find specimens that agree in detail with the descriptions of either this or *E. fistulosum* Barrett. Our plants have solid stems, which places them with this species, but they definitely are not vanilla-scented as this species is supposed to be.

Eupatorium altissimum L. Tall Boneset. On knolls and ridges, and high banks of lakes. In openings in woods, west part of Estherville.

Eupatorium perfoliatum L. Boneset. Common along borders of marshes and sloughs.

Eupatorium rugosum Houtt. White Snakeroot. Very common in woods.

Kuhnia eupatorioides L. var. *corumbolosa* T. & G. Prairie False Boneset. Common on dry prairie.

Liatris pycnostachya Michx. Prairie Blazing-star. Common on low prairie.

Liatris aspera Michx. Button Blazing-star. Common on dry prairie and open ridges in woods.

Liatris ligulistylis (Nels.) K. Schum. In an area of flat virgin prairie in sect. 25, Lincoln Tp., grows abundantly a very tall form of *Liatris*, with long-peduncled heads, peduncles and phyllaries conspicuously red in the fresh plant. Some specimens, collected September 1, 1952, were sent to Gray Herbarium, where they were examined by Dr. Lulu O. Gaiser. Dr. Gaiser did not consider the specimens to be true *L. ligulistylis* of farther west and north, but rather intermediates or hybrids, nearer to that species than to *L. aspera*, and called attention to similar intermediates found in Minnesota and the Dakotas. Dr. Gaiser also stated in regard to the Emmet County specimens: "The fact that they are so tall even suggests a kind of hybrid vigor that outstrips either parental species."

- The part of the prairie where this *Liatris* was most luxuriant was put under cultivation in 1953, but perhaps scattered plants may be found in the remaining portion.
- Liatris punctata* Hook. Dotted Blazing-star. Common locally on the gravel plain of the Des Moines River, and on high prairie in Twelve-mile Lake and Lincoln townships.
- Liatris squarrosa* (L.) Michx. var. *hirsuta* Rydb. Blazing-star. On dry prairie in the southwestern corner of the county. Sect. 31, Twelve-mile Lake; more common on a beautiful area of prairie in sect. 32; also in sections 29 and 33.
- Grindelia squarrosa* (Pursh.) Dunal. Gumweed. Local on dry hillsides in south part of High Lake, in Jack Creek, and in Lincoln.
- Solidago flexicaulis* L. Wood, or Zigzag Goldenrod. Wooded banks and shady cool slopes.
- Solidago speciosa* Nutt. var. *angustata* T. & G. Slender Showy Goldenrod. On dry prairie and knolls. High Lake, Estherville, and Emmet townships.
- Solidago missouriensis* Nutt. Along Rock Island railroad tracks, northwest of Estherville, and in Emmet. According to some authorities Iowa is not included in the range of this species, but as it is treated in Gray the writer includes it for Emmet County.
- Solidago missouriensis* var. *fasciculata* Holzinger. Common on dry prairie, especially in Emmet. As the writer understands it this includes both *S. glaberrima* Martens and its var. *moritura* Palmer & Steyerl.
- Solidago nemoralis* Ait. Field Goldenrod. Dry open woods; dry or gravelly prairie and knolls.
- Solidago nemoralis* var. *decemflora* (DC.) Fern. In similar situations.
- Solidago canadensis* L. var. *gilvocanescens* Rydb. (*S. pruinosa* Greene). Pasture Goldenrod. Abundant in low or gravelly pastures and on drier borders of fens.
- Solidago canadensis* L. var. *hargerii* Fern. Gray gives this a more eastern range. The author's material was named by Dr. L. H. Shinnars, who suggested that this variety should rather be called *S. altissima* var. *hargerii*. Some have called it *S. altissima* L., but it is decidedly different from the larger-headed *S. altissima* farther east in the state. It is common in open or pastured woods, and also along roadsides.
- Solidago gigantea* Ait. Large Goldenrod. In low open ground and along borders.
- Solidago gigantea* var. *leiophylla* Fern. Smooth Goldenrod. The most common form. Low ground, roadside ditches, and borders. (One specimen was called by Dr. Shinnars as follows: *Solidago dumetorum* Lunell (*S. gigantea* X *S. pruinosa*). *S. dumetorum* is not mentioned in Gray.)
- Solidago rigida* L. Stiff Goldenrod. Common on dry prairie roadsides, dry banks and borders.
- Solidago riddellii* Frank. Grass-leaved Goldenrod. In fens, Emmet and Estherville townships; low prairie, High Lake.
- Solidago graminifolia* L. Bushy Goldenrod. Infrequent in low ground, and in fens.
- Boltonia latisquama* Gray var. *microcephala* Fern. & Griseb. Boltonia. Common around sloughs and marshes.
- Aster woldeni* Rydb. Along roadsides between sections 30 and 31, in Ellsworth Tp.; also a mile west in Emmet Tp.; on high prairie sect. 33, Emmet Tp. It is stated in Gray that this is an evident hybrid and combines in varying degrees the characters of *A. azureus*, *A. shortii*, and *A. sagittifolius*. All of these have cordate lower leaves, while in *A. woldeni* there is no suggestion of cordate leaves. Neither *A. azureus* nor *A. shortii* are found in this part of the state. The author has not seen *A. azureus* within 80 miles, and *A. shortii* is found only in the eastern part of the state.
- Aster cordifolius* L. Wood Aster. Abundant in hilly woods, and along wooded banks and slopes. In our plants the phyllaries vary from obtuse to subacute, up to Imm. broad, to narrower and more attenuate,

- and it probably grades into the var. *moratus* Shinners, which here does not seem very distinct.
- Aster sagittifolius* Wedemeyer. Arrow-leaved Aster. In upland woods, sections 21 and 28, Emmet Tp. Passes through many forms, (forma *hirtellus* (Lindl.) Shinners), into the following variety which is the common plant.
- Aster sagittifolius* var. *drummondii* (Lindl.) Shinners. With the above in Emmet Tp.; also escaped from transplantings into woods in the north part of Estherville.
- Aster oblongifolius* Nutt. On dry knolls and open ridges along the Des Moines River and westward. This includes the var. *rigidulus* Gray (*A. kumleini* Fries.), which is our common form.
- Aster novae-angliae* L. New England Aster. In low ground along banks and borders and roadsides. The forma *roseus* (Desf.) Britt. is rare.
- Aster puniceus* L. Red-stem Aster. Around sloughs, marshes, and fens. Hybrids with *A. simplex* or its variety are common. Passes into the following variety through various gradations.
- Aster puniceus* var. *firmus* (Nees.) T. & G. This includes the var. *lucidulus* Gray, in all its forms, and apparently is wide enough in its scope to also include the very distinct-looking *A. nebraskensis* Britton. Local specimens which were identified as that species by both Rydberg and Weatherby, perhaps can be worked into this variety. Gray makes no mention of *A. nebraskensis*.
- Aster sericeus* Vent. Silky Aster. Rather frequent on dry prairie, and on open, grassy ridges in Estherville woods.
- Aster laevis* L. Smooth Aster. (Includes *A. concinnus* of ed. 7) Common. Dry prairie, roadsides, ridges and hillsides in woods, and along banks. Wide-leaved forms may be called forma *latifolius* (Porter) Shinners.
- Aster pilosus* Willd. On high, open hillside in the west part of Estherville.
- Aster pilosus* var. *demotus* Blake. In the same location. Also in sandy ground on the southwest side of Twelve-mile Lake.
- X *Aster amethystinus* Nutt. Usually on moist prairie, at the dry edge of marshy places.
- Aster ericoides* L. Dense-flowered Aster. Very common on dry prairie. Consists of forma *prostratus* (Ktze.) Fern., forma *exiguus* Fern., forma *caeruleus* (Benke) Blake, and forma *gramsii* Benke.
- Aster ericoides* L. X *Aster oblongifolius* Nutt. (*Aster batesii* Rydb.) Roadside, west side of sect. 12, Emmet. Specimen named by L. H. Shinners.
- Aster commutatus* (T. & G.) Gray. In upland fen north of Estherville, sect. 10, Estherville. Determined by L. H. Shinners.
- Aster lateriflorus* (L.) Britt. In gravelly ground near Rock Island tracks, south part of Estherville.
- Aster ontarionis* Wieg. Low, or higher woods, and very abundant on floodplains of streams, in open ground or in shade.
- Aster praealtus* Poir. Willow-leaved Aster. Very abundant, and variable according to habitat.
- Aster praealtus* var. *angustior* Wieg. High Lake, Emmet.
- Aster praealtus* var. *subasper* (Lindl.) Wieg. High Lake.
- Aster coerulescens* DC. Not in Gray. A specimen was thus named by Dr. Shinners.
- Aster simplex* Willd. Common along roadsides, especially among, or under trees.
- Aster simplex* var. *ramosissimus* (T. & G.) Cronq. Eagle Lake shore.
- Aster junciformis* Rydb. Rush Aster. Locally frequent in fens in sect. 21, Emmet.
- Aster johannensis* Fern. Banks of Cheever Lake.
- Aster ptarmicoides* (Nees.) T. & G. Upland White Aster. On high prairie in the western part of the county, west of the Des Moines River.
- Aster umbellatus* Mill. var. *pubens* Gray. Flat-topped White Aster. Common in fens and around springs.
- Aster brachyactis* Blake. Rayless Aster. During years of drought, with widened beaches around lakes and sloughs, this becomes common.

- During the wet years it is almost absent.
- Erigeron philadelphicus* L. Fleabane. In wet fields and along shores.
- Erigeron annuus* L. Daisy-Fleabane. Hay fields, pastures, and roadsides.
- Erigeron strigosus* Muhl. var. *beyrichii* (Fisch. & Mey.) T. & G. In dry pastures.
- Erigeron canadensis* L. Horseweed. A weed in fields and waste ground.
- Erigeron divaricatus* Michx. Low Horseweed. On Des Moines River floodplain in High Lake.
- Antennaria neglecta* Greene. Pastures, open woods, and prairie.
- Antennaria plantaginifolia* (L.) Hook. Plantain-leaved Everlasting. In dry open woods and pastures.
- Iva xanthifolia* Nutt. Marsh Elder. In waste ground and vacant yards.
- Ambrosia trifida* L. Great Ragweed. Common weed. Forma *integrifolia* (Muhl.) Fern. In dry, thin soil or among trees.
- Ambrosia artemisiifolia* L. var. *elatior* (L.) Desc. Small Ragweed. Abundant weed. Forma *villosa* Fern. & Griseb. is common.
- Ambrosia psilostachya* DC. var. *coronifolia* (T. & G.) Farw. In sandy or gravelly soil, lake banks and gravel plains.
- Xanthium chinense* Mill. Cocklebur. Low ground, fields and floodplains.
- Xanthium italicum* Moretti. Sandy soil, lake shores, and cultivated fields.
- Xanthium varians* Greene. Fields, lake shores Tuttle Lake.
- Xanthium wootoni* Cockerell. Shore of Tuttle Lake in dry years.
- Silphium perfoliatum* L. Cup-plant. In low ground, along low borders.
- Silphium integrifolium* Michx. Entire-leaved Rosinweed. Rare. Along M. & St. L. R. R. just north of Estherville.
- Silphium laciniatum* L. Rosinweed. Compass-plant. Once common on virgin prairie. Still survives along some roadsides and along railroads where prairie conditions have been preserved.
- Heliopsis helianthoides* (L.) Sweet. Oxeye. Smooth specimens are rare in woods. Most plants are the variety.
- Heliopsis helianthoides* var. *scabra* (Dunal) Fern. Very common along roadsides.
- Rudbeckia laciniata* L. Tall Coneflower. Low open woods and borders; floodplains.
- Rudbeckia serotina* Nutt. Black-eyed Susan. Hayfields, meadows and roadsides.
- Echinacea angustifolia* Dc. Purple Coneflower. Along railroads and dry prairie roadsides.
- Ratibida pinnata* (Vent.) Bernh. Gray Coneflower. Common along prairie roadsides. One of the prominent plants of the dry prairie.
- Helianthus annuus* L. Common Sunflower. Escaped from cultivation to roadsides and fence rows.
- Helianthus petiolaris* Nutt. An annual introduced from farther west. For some years was a frequent weed in flax fields.
- Helianthus laetiflorus* Pers. Showy Sunflower. Infrequent along fence rows. Emmet, Ellsworth, and no doubt other parts.
- Helianthus laetiflorus* var. *rigidus* (Cass.) Fern. Stiff Sunflower. Common on dry prairie and roadsides.
- Helianthus laetiflorus* var. *subrhomboides* (Rydb.) Fern. On gravelly soil in the southeast part of Estherville.
- Helianthus maximiliani* Schrad. Common along prairie roadsides.
- Helianthus strumosus* L. Wood Sunflower. Open woods, borders and wooded roadsides.
- Helianthus trachelifolius* Mill. Open woods and borders.
- Helianthus tuberosus* L. var. *subcanescens* Gray. Gray Artichoke. Common weed around woods.
- Helianthus grosseserratus* Martens. Sawtooth Sunflower. Common. Low roadsides, fields, and around fens.
- Verbesina encelioides* (Cav.) B. & H. var. *exauriculata* Robins. & Greenman. Crown-beard. Some years ago this was established in a pasture in sect. 20, Ellsworth.
- Coreopsis palmata* Nutt. Tickseed. Frequent on upland prairie.

- Bidens cernua* L. Stick-tight. Bur-Marigold. Along shores of lakes and marshes.
- Bidens connata* Muhl. Swamp Beggar-ticks. In wet ground. Estherville.
- Bidens comosa* (Gray) Wieg. Leafy-bracted Tickseed. Borders of sloughs and around lakes.
- Bidens vulgata* Greene. forma *puberula* (Wieg.) Fern. Hairy Beggar-ticks. Shores of sloughs and rivers.
- Bidens frondosa* L. Low ground, wet fields.
- Galinsoga ciliata* (Raf.) Blake. Roadside between Ellsworth and Emmet townships, south of Highway 17; back alleys in Estherville.
- Helenium autumnale* L. var. *canaliculatum* (Lam.) T. & G. Sneezeweed. Along banks and borders of marshes and sloughs.
- Achillea millefolium* L. Yarrow. In dry pastures. Abundant in pastured upland prairie.
- Achillea lanulosa* Nutt. In dry pastures.
- Anthemis cotula* L. May-weed, Dog-fennel. Common in barnyards.
- Matricaria matricarioides* (Less.) Porter. Rayless Chamomile. In farm yards, and abundant along shoulders of some highways.
- Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecoq. & Lamotte. Ox-eye Daisy. Rarely escaped along roadsides. Oak Hill Cemetery.
- Tanacetum vulgare* L. Tansy. Occasionally established along roadsides near farm yards.
- Artemisia caudata* Michx. Tall Wormwood. On gravelly knolls and sandy banks.
- Artemisia glauca* Pall. Linear-leaved Wormwood. Along dry banks and beaches.
- Artemisia biennis* Willd. Biennial Wormwood. Often a weed in barnyards.
- Artemisia serrata* Nutt. On prairie, sandy lake banks, and borders of woods.
- Artemisia ludoviciana* Nutt. Mugwort. Borders of woods and prairie.
- Artemisia ludoviciana* var. *gnaphalodes* (Nutt.) T. & G. Dry prairie hills, and roadside banks.
- Artemisia ludoviciana* var. *latifolia* (Bess.) T. & G. Broad-leaved Wormwood. On gravelly ground in the south part of Estherville.
- Artemisia ludoviciana* var. *pabularis* (Nels.) Fern. On gravelly ground in the south part of Estherville.
- Artemisia absinthium* L. Wormwood. Recorded by Cratty as introduced in waste places.
- Erechtites hieracifolia* (L.) Raf. var. *intermedia* Fern. Fireweed. Rare or occasional. In years of low water has appeared along shores of lakes; in ravine near Estherville.
- Cacalia tuberosa* Nutt. Tuberous Indian-plantain. Infrequent on level prairie and sometimes on higher ground.
- Senecio congestus* (R. Br.) DC. var. *palustris* (L.) Fern. Marsh-Fleabane. During series of dry years early in the century became very abundant on wide dry beaches of lakes and ponds, and very conspicuous around Ingham Lake. Now seldom seen.
- Senecio integerrimus* Nutt. Groundsel. On a prairie roadside in Emmet; along railroad right-of-way between Estherville and Wallingford; in pastured land north of the Des Moines River bridge in that area, partly in open oak woods. Many plants in this area are long-hairy, and a specimen sent to Dr. J. M. Greenman in 1926, was referred by him to a far western species, *S. hookeri* T. & G. Perhaps our plants are better considered a pubescent form of *S. integerrimus*.
- Senecio plattensis* Nutt. On high prairie hills and knolls. Rare within the county but more common along the Des Moines River, across the state line in Minnesota.
- Senecio pauperculus* Michx. Rare. On prairie two miles east of Wallingford; on the crest of a high eroded slope along valley on county farm.
- Senecio pauperculus* var. *balsamitae* (Muhl.) Fern. In muck near the north end of large fen in sect. 21, Emmet; highway ditches, along 17, northward from Estherville.

- Senecio aureus* L. var. *intercurtus* Fern. Golden Ragwort. Squaw-weed. Low roadside, one mile south of Highway 17, between Emmet and Ellsworth townships.
- Senecio aureus* L. var. *gracilis* (Pursh.) Wood. In eroded drift near top of south slope of ravine in woods south of Estherville, west of Highway 17.
- Senecio aureus* L. var. *semicordatus* (Mackenz. & Bush) Greenm. Prairie, High Lake.
- Arctium tomentosum* Mill. Burdock. In Estherville woods.
- Arctium minus* (Hill) Bernh. Burdock. Common weed. Farm yards and groves.
- Carduus acanthoides* L. Plumeless Thistle. In ground around old stack bottom in sect. 8, Emmet, in 1928.
- Cirsium vulgare* (Savi) Tenmore. Bull Thistle. Weed in pastures.
- Cirsium flodmani* (Rydb.) Arthur. Woolly Thistle. Dry ground, and common on pastured prairie.
- Cirsium discolor* (Muhl.) Spreng. Field Thistle. Low ground, fencerows, in the vicinity of woods and borders.
- Cirsium iowense* (Pammel) Fern. Iowa Thistle. Along roadsides and in fence rows. Colonies of white-flowered plants have been observed.
- Cirsium arvense* (L.) Scop. Canada Thistle. Much too abundant around the borders of marshes, along river bottoms, often on state-owned land.
- Centaurea maculosa* Lam. Spotted Knapweed. Locally abundant along roadside near the south side of Twelve-mile Lake.
- Cichorium intybus* L. Chicory. Introduced in pastures and along roads in some localities.
- Tragopogon major* Jacq. Goat's-beard. A common introduced weed along roadsides.
- Taraxacum erythrospermum* Andr. Red-seeded Dandelion. In sandy or light soil, but also in yards and lawns with the following.
- Taraxacum officinale* Weber. Common Dandelion.
- Sonchus arvensis* L. var. *glabrescens* Guenth, Grab. & Wimm. Smooth Perennial Sow-Thistle. Has become common in fields and nearby roadsides.
- Sonchus oleraceus* L. Common Sow-Thistle. A weed in waste ground.
- Sonchus asper* (L.) Hill. Spiny-leaved Sow-Thistle. Weed in waste ground.
- Lactuca scariola* L. Prickly Lettuce. A common weed in yards and groves.
- Lactuca scariola* L. forma *integrifolia* (Bogenh.) G. Beck. Common in similar situations.
- Lactuca canadensis* L. var. *longifolia* (Michx.) Farw. Tall Lettuce. Woods, borders, and open ground.
- Lactuca ludoviciana* (Nutt.) Riddell forma *campestris* (Greene) Fern. Western Lettuce. Roadside sand prairie.
- Lactuca pulchella* (Pursh.) DC. Blue Lettuce. Local along roadsides.
- Lactuca biennis* (Moench.) Fern. Tall Lettuce. Common in low open woods. Our plants are usually bristly-hirsute, with dirty-creamy flowers.
- Lygodesmia juncea* (Pursh) D. Don. Dry prairie hills and knolls.
- Agoseris cuspidata* (Pursh) Raf. Prairie False Dandelion. Prairie knolls and slopes. Fort Defiance State Park.
- Prenanthes racemosa* Michx. Glaucus White Lettuce. Along prairie roadsides.
- Prenanthes aspera* Michx. Rough White Lettuce. Along prairie roadsides. Frequent in Emmet and Ellsworth townships.
- Prenanthes alba* L. White Lettuce. Rattlesnake-root. Frequent in woods and along banks.
- Hieracium canadense* Michx. var. *fasciculatum* (Pursh.) Fern. Hawk-weed. In upland woods south of Estherville.
- Hieracium umbellatum* L. Reported by Dr. Ada Hayden as *H. scabriusculum* Schwein., from "wooded slopes along Brown Creek south east of Estherville."

PLANTS REPORTED FROM THE COUNTY
BUT NOT INCLUDED IN THIS LIST

Some of the following were misidentifications. Others were credited to Emmet County by T. J. Fitzpatrick in "Manual of Flowering Plants of Iowa," 1899, and a few by B. Shimek in various of his published papers. None of these have been collected by the author but he realizes the possibility that some may have become extinct as have a number of other species during more recent decades.

Acerates floridana (Lam.) Hitchc. Shimek. This is now *Asclepias hirtella* (Pennell) Wooden.

Allium cernuum Roth. Reported by Fitzpatrick and Cratty. A misidentification.

Angelica atropurpurea L. Shimek.

Asclepias purpurascens L. Fitzpatrick.

Campanula rotundifolia L. Fitzpatrick.

Eragrostis pilosa (L.) Beauv. of Gray, eighth edition, is not the plant referred to in the author's earlier list.

Galium palustre L. Shimek.

Geranium pusillum L. Not established. Reported by Cratty from a specimen collected in the author's yard.

Geum triflorum Pursh. Shimek.

Hydrocotyle americana L. Cratty mistook the root leaves of another plant for those of this species and it was erroneously included in his "Iowa Plant Notes, IV."

Lithospermum gmelini (Michx.) Hitchc. Fitzpatrick.

Lonicera sullivanti Gray. Fitzpatrick.

Ludvigia palustris (L.) Ell. Fitzpatrick.

Panicum dichotomum L. Included by Cratty in "Flora of Emmet County" but later excluded from his Iowa flora.

Phlox maculata L. Fitzpatrick.

Symphoricarpos orbiculatus Moench. Credited to Estherville woods by Shimek. Flowering specimens of a form of *S. occidentalis* Hook, with bearded style, found in Estherville woods, may have been mistaken for this.

Stachys aspera Michx. Fitzpatrick. This may have been the form of *S. palustris* with petioled leaves.

Thaspium trifoliatum aureum (Nutt.) Britton. Cratty. This was probably intended for *Thaspium barbinode*, which was missing from his flora.

Viola palmata L. The hybrid *Viola pedatifida* X *V. sororia* was mistaken for this.

List of References

- Cratty, R. I. 1904. Flora of Emmet County, Iowa. Proc. Iowa Acad. Sci. XI: 201-251.
- Cratty, R. I. 1905. Flora of Emmet County, Iowa. II. Iowa Naturalist, Vol. I: 36-38.
- Fernald, M. L. 1950. Gray's Manual of Botany. 8th Ed. American Book Co.
- Fitzpatrick, T. J. 1899. Manual of the flowering plants of Iowa. Privately pub.
- Pammel, L. H. 1903. The grasses of Iowa. Part II. Iowa Geol. Survey, Supplementary report.
- Shimek, B. 1915. The plant geography of the Lake Okoboji region. Lab. Nat. Hist. Univ. Iowa Bull. 7 (2): 1-90.
- Shimek, B. 1911. The prairies. Bull. Nat. Hist. State Univ. of Iowa. Vol. 6: 169-240.

ESTHERVILLE, IOWA