# An Ecological Survey of the Litzsinger Road Ecology Center, 1992

Report provided by:

Dr. Clifford Ochs
Department of Biology
University of Mississippi
University, MS 38677

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## Introduction

The Litzsinger Road Ecology Center (LREC), an urban nature reserve, was established in 1990. Distinct ecosystems contained on the site are a restored prairie, bottomland hardwood forest, and an intermittently flowing creek. A newly renovated facility is available for indoor educational activities. The LREC is remarkable in that it is surrounded on all sides by urban and suburban development. Thus, the LREC serves as a potential refuge for plant and animal species no longer easily found in St. Louis County. In addition, because of its proximity to many schools, the LREC may serve as a focal point for a wide range of activities in outdoor education and research. Since 1991 the site has been visited by students from primary and secondary schools and local colleges. The LREC is managed by the Missouri Botanical Garden.

Between April and October 1992 I conducted a survey of the natural features of the LREC. The results of the survey are described by this report. The report includes lists of the plants and animals observed at the site during the survey, with descriptions of the time of year and habitat in which various organisms are most likely to be found. In addition, there are descriptions of the soils, geology, hydrology, and ecological communities of the LREC, with suggestions for possible management options.

## Abiotic features of the Litzsinger Road Ecology Center

### Physical description of site

The LREC is located in the city of Ladue in St. Louis County, Missouri. The site can be found on a U.S. Geological Survey 7.5 minute quadrangle map at T4SN R6E, Section 19 (N3837.5-W9022.5), which is at the southeast corner of the Creve Coeur map and the northeast corner of the Kirkwood 7.5 minute map.

The total size of the LREC is 34.5 acres. Approximately 14 acres are in bottomland hardwood forest including a section of Deer Creek, 10 acres are in restored tall grass prairie, 6—7 acres are residential, and 3 acres are used as a pasture for horses. Much of the site is flat or gently sloping upwards on either side of Deer Creek. The lowest point on the site is the bed of Deer Creek at about 460 feet (140 a); the highest point is at about 505 feet (153 in) at the SW corner of the property.

The climate of St. Louis County is marked by cold winters and long, hot summers. In spring and early summer, when moist air from the Gulf of Mexico interacts with drier continental air, there tends to be heavy rains.

For a 25 year period between 1951 and 1976, the National Climate Center monitored rainfall and precipitation in St. Louis county. These data are published in the Soil Survey of St. Louis County and St. Louis City, Missouri (1982) The average temperature in winter during this period was 33°F (0.5°C) and the average daily minimum temperature was 24°F (-4.4°C). In summer the average temperature was 77°F (25°C); the average daily maximum temperature was 87°F (30.5°C).

The total annual precipitation measured by the National Climate Center was 33.8 inches (86 cm). About 60% of the annual precipitation falls in April through September. There are thunderstorms on about 50 days each year, mostly in summer. Average seasonal snowfall was 18 inch (45.7 cm). On an average of 9 days there was 1 inch (2.5 cm) of snow on the ground although the actual amount varied greatly between years.

The average relative humidity in mid-afternoon in St. Louis County was about 60%. At night the humidity increases. The sun shines about 70% of the time possible in summer and 50% in winter. Winds tend to come from the south.

## Geology

The bedrock geology in St. Louis County consists primarily of flat-lying sedimentary formations of limestone and dolomite (Lutzan and Rockaway 1971). Rocks of the St. Louis Formation (Meramecian Series) are exposed in the bed and along the sides of the channel of Deer Creek. The St. Louis Formation is a gray, medium to massively bedded limestone, usually averaging over 100 feet (30.5 in) in thickness. It’s texture ranges from lithographic (extremely tiny crystals) to finely crystalline; parts of the formation are locally dolomitic. St. Louis County is the type area for the formation which is quarried locally for cement manufacture and aggregate.

Rocks of the St. Louis Formation were deposited during the middle to upper Mississippian Period of the Paleozoic Era (roughly 340-300 million years ago). During this time, the midwestern region of the North American continent lay well to the south of the Equator, at approximately 15° south

latitude. Shallow tropical or subtropical seas covered much of the midwest depositing thick sequences of carbonate rocks, mostly limestones.

Some of these limestones show local dolomitization. Dolomitization is the process by which calcium ions in calcium carbonate, the mineral constituent of limestone, are partially replace by magnesium ions, creating dolostone. A few examples of dolostone were observed at the site. Dolomitization is believed to be a diagenetic process, taking place as the sediment is being converted to rock. Current evidence suggests that dolomitization takes place in essentially reef situations, especially on the landward side of reefs where the water is shallow. The shallow water permits a concentration of magnesium-rich brines which permeate the limy muds during lithification.

Fossils are abundant in the bed of Deer Creek. Fossils found at the site include the tabulate colonial coral, *Syringopora,* a common constituent of the St. Louis limestone, and a spiriferid brachiopod, which has not been further identified. The fossils as well as the type of rock found at the site indicate a shallow tropical or subtropical marine depositional environment.

## Soils

The soils of St. Louis County have been surveyed and mapped by the Soil Conservation Service (1982). Much of the soils of the LREC are mapped as Wilbur silt loam. Wilbur silt loam is a nearly level, moderately well drained soil common to small stream bottoms and adjacent to the channel of larger streams in the St. Louis region. These soils are formed from alluvium from bess covered uplands. Flooding is common on Wilbur silt loam, permeability is moderate, and

surface runoff slow.

The soils of LREC directly adjacent to Deer Creek tend to be sandy. As one moves away from the creek the soils grade to silt and silty barns. When flooding occurs small soil particles of silt are deposited farther from the creek channel than are larger particles of sand.

A small area along the east side of Deer Creek is mapped on soils of the Menfro—Urban land complex; these are moderately sloping sideslope soils with moderate permeability and surface runoff.

With post-settlement development there is likely to have been an increase in the amount of runoff and rate of soil erosion in the watershed of Deer Creek. With an increase in runoff there would be downcutting and higher flood amplitudes of Deer Creek. With more runoff and erosion there would be an increase in silt deposition in low-lying areas of the Deer Creek watershed, which are prone to flooding, such as at the site. An increase in silt deposition at the site would alter soil characteristics and presumably species composition of the plant community.

## Hydrology and Chemistry of Deer Creek

The major surficial hydrological feature of the Litzsinger Road Ecology Center is Deer Creek which transverses the site between the northeast and southeast corner. Deer Creek is a third-order stream. The gradient of the creek in the region of the LREC is about 6.1 meters per mile (20 feet/mile). The size of the watershed of Deer Creek is 3324 hectares (9450 acres). The site is approximately 5 miles upstream from the confluence of Deer Creek and River Des Peres which, in turn, is approximately 6 miles upstream from the Mississippi River.

Water flows through Deer Creek at all times of year except mid-summer when precipitation is least and evapo-transpiration is highest with active growth of vegetation consuming much of the subsurface soil water. In mid to late-summer Deer Creek may be completely dry except for intermittent pools, the deepest of which occur in the lower reaches of Deer Creek within the site.

In early summer Deer Creek exhibits the typical pool and riffle pattern of shallow streams of a low to moderate gradient. Pools of slow—moving water several centimeters to a meter or more deep are interspersed with areas in which shallow water is flowing rapidly over a rocky substrate.

As noted above, Deer Creek floods often, most commonly in spring or early summer when rainfall is highest. As a result of intense development in it’s watershed it is possible that Deer Creek has become prone to lower midsummer ambient water levels, more frequent and larger amplitude flooding, and faster rates of water level change. Major floods have occurred on four dates since 1957 (June 1957, April 1973, April 1979, and July 1991). Due to occasional high flow, erosion and subsequent sloughing of the stream bank in several areas is severe.

On August 31, 1992 water was collected from Deer Creek for a chemical profile. On this date, the stream was dry except for a few pools. Chemical measurements were made by the St. Louis Testing Laboratories in St. Louis, MO. The results, in mg/L, are shown below:

| ANALYTE | RESULT | METHOD DETECTION LIMIT |
|---|---|---|
| pH | 8.22 | 0.02 |
| Alkalinity | 118 | 10 |
| Fecal Coliform | TNTC* | 1 col/100 ml |
| Biological Oxygen Demand | ND | 10 |
| Nitrate | ND | 0.113 |
| Nitrite | ND | 0.075 |
| Phosphorus | ND | 0.05 |
| Potassium | 5.38 | 0.01 |
| Total dissolved solids | 298 | 5 |

*TNTC: Too numerous to count
ND: not detected

Chemical measurements made at other times of the year would help to detect if there are time-dependent patterns in the water chemistry of Deer Creek.

## Biotic features of the Litzsinger Road Ecology Center

### Plant Communities

**Bottomland hardwood forest and riparian area**

There are approximately 14 acres of bottomland hardwood forest at LREC. The forested area is in the floodplain of Deer Creek which runs through the forest from the northwest corner to the southeast corner of the property.

It is uncertain when the forest was last logged. The

forest on the north side of Deer Creek appears to be at least 90 years old; forest on the south side of the creek is probably younger. The forest canopy is tall (estimated as between 60-90 feet in some places) and is closed after about mid-June when the trees are fully leafed out. Ground cover in much of the forest is dominated by wood nettle *(Laportea canadensis)* and the introduced weed, *Euonymus fortunei.*

The forest bears resemblance to the wet-mesic bottomland forest classification of Nelson (1987). Wet-mesic forest was at one time the most extensive bottomland forest natural community in Missouri. Trees characteristic of the wet-mesic forest which occur at LREC include pin oak *(Quercus palustris),* river birch *(Betula nigra),* cottonwood *(Populus deltoides*), and pecan *(Carya illinoensis).*

Considerable postsettlement alteration of the forest has probably resulted in elimination of some trees and other vegetation characteristic of the bottomland hardwood forest. Plants favored by postsettlement activity in the forest or in the watershed of Deer Creek, such as box elder *(Acer negudo),* have become a common component of the present forest plant community. *Laportea canadensis* (wood nettle), although a native plant, is remarkably extensive in the forest in late summer and fall. According to Douglas Ladd of the Nature Conservancy, intermittent fires were an important factor determining the species composition of the bottomland forest community in St. Louis County. Furthermore, development in the Deer Creek watershed has likely made the area more prone to flooding. Suppression of fire, more frequent flooding, and possibly logging have resulted in a forest community that may be significantly different from the presettlement condition.

**Prairie**

Tallgrass prairie was once extensive in St. Louis County probably including the region now occupied by the LREC (Schroeder 1981). In postsettlement times almost all of the prairie has been converted to agriculture or developed. At LREC the region now occupied by prairie was used for growing row crops in this century. Eastern gamma grass *(Tripsacum dactyloides),* a possible remnant of the original prairie, can be found by the edge of the stream on the eastern side of the property.

The prairie at LREC was initially seeded on May 18, 1989 by William Davitt. In it's present condition it would be classified as a mesic prairie by Nelson (1987). Mesic prairies occur on rich, well-drained deep soils that retain ample moisture. It is common to find them at the base of a hill where moisture is plentiful.

The prairie at LREC is a mixture of grasses, forbs, and a few scattered trees. Growing on rich alluvial soils and with plenty of water the prairie will attain a height in excess of 8 feet.

Fire is an important factor in maintenance of a prairie. Without fire every few years or less a prairie will revert to forest. The prairie at LREC has been burned on a yearly basis since 1989. Burning normally takes place in spring.

A list of the plants observed and collected at LREC is given in Appendix 1. For the entire property there were 343 plants identified. These included 220 forbs, 44 trees, 38 grasses, 18 vines, 14 shrubs, 8 sedges, and 1 fern. The prairie and forest each contain about 100 different plant species, the mowed area around the prairie and pasture contains about 80 species, and the riparian zone contains about 50 species. The plant family with the largest

representation on the site is the Asteraceae with 63 species, followed by the Poaceae.

Wilhelm and Ladd (1988) have developed a system of natural area assessment which assigns to each native species a number indicating it's degree of faithfulness to a particular habitat or set of environmental conditions. The numbers range from 0 to 10, with more conservative species having higher numbers. The more conservative a species is the more specially adapted it is to a specific set of biotic and abiotic conditions. Highly conservative species are more susceptible to alteration of their habitat than are nonconservative species. Nonconservative species tend to be common in landscapes that have been altered or disturbed by human activity. (Wilhelm and Ladd 1988). The most conservative *(sensu* Wilhelm and Ladd 1988) plants at LREC occur in the restored prairie where there is an ongoing effort to introduce native plant species. In the prairie there are 11 plants with coefficient of conservatism numbers of 7 or greater. One plant, *Silene rigia*, has a coefficient of 10, indicating that it is highly adapted to very particular environmental conditions.

Of the 343 plants identified, 91 are non-native species. A few of the non-native species are very weedy and have become serious problems at the site. In the forest and riparian zone, non-native weeds including *Humulus japonicus* (Japanese hops), *Euonymus fortunei* (wintercreeper), and *Lonicera japonica* (Japanese honeysuckle) are wide-spread. Japanese hops is also very abundant in the prairie, as are other non-native plants including *Setaria* sp. (foxtail grass), *Fesctuca* sp. (fescue), and the two species of *Vicia* (vetch) found at the site. The regularly mowed sections of the site are composed of numerous non-native species which thrive in disturbed areas. *Alliaria petiolata* (garlic

mustard), a non—native plant, has been observed along the old railroad right-of-way which transects the northern border of the site. Garlic mustard has the capacity of spreading quickly through an area if not controlled. Attention should be paid to keep this plant from becoming a serious pest in the near future.

## Insects

The Litzsinger Road Ecology Center is a good place for studies of insects and spiders. As for other animals and plants, the key for biological diversity is habitat diversity. Different species of arthropods occur in the three distinct habitats at LREC, the prairie, the forest, and Deer Creek. Many of the insects described in the following account have been collected at LREC by either John Christensen or Bill Brandhorst and are now on display at the cabin.

Insects common to the forest which one may find flying through the air or on leaf surfaces or tree trunks include craneflies, the green lace wing, planthoppers, the twelve-spotted cucumber beetle, and moths. Cicada larval skin casts have also been found attached to tree trunks in the forest. Psychide moth larvae, or bagworms, produce silken bags covered with bits of twigs and leaves which can be found hanging from the branches of trees. The nests of paper wasps, constructed of chewed-up wood, can be found attached to trees.

Arthropods common to the forest floor include crickets, various beetles, ants, termites, and such non-insects as sowbugs, various spiders, centipedes and millipedes. Darkling beetles or ground beetles can be found under the bark of old fallen logs. In the winter, many insects such

as ladybugs and various flies hibernate underneath bark. Termites and carpenter ants can be found inside a rotten log.

A walk through the mowed path around the prairie will reveal crickets and grasshoppers flying out of the way. On prairie flowers can be found numerous insects, some of whom are pollinators, including bees, wasps, flies, beetles, butterflies, and moths. Bees observed at the site include the honeybee, bumble bees, and the carpenter bee. Fly pollinators collected in the prairie include the flower fly and the bee fly. Wasps observed in or near the prairie include the yellow jacket, potter wasps, spider wasps, the ichneumon wasp, bald—faced hornets, and mud dauber wasps.

Prairie flowers are also a good place to find beetles such as the twelve-spotted cucumber beetle and the milkweed beetle which, as it’s name implies, is most often found on milkweed plants. Insects which feed exclusively on milkweed plants include the monarch butterfly caterpillar, the red milkweed bug, and the small milkweed bug. Other insects which feed on plants of the prairie include aphids and the larvae of various “leaf-miners” (insects which deposit eggs into the middle layer of leaves where the larvae develop) including beetles, moths, flies, and wasps.

Insects flying about the prairie include dragonflies and numerous butterflies, many of which have been collected and are on exhibit at the site.

Deer Creek is habitat for many insects having an aquatic stage. The sand and gravel bars are a good location to find tiger beetles and the toad bug. Along the edge of pools have been observed shore bugs and springtails. On the water surface have been observed water striders and the much smaller broad-shouldered water-strider. Crawling water beetles have been observed at the bottom of the creek.

Beetles such as the backswimmer and the predaceous diving beetle have been observed swimming in the water. Damselfly nymphs have been collected from underneath rocks at the bottom of shallow pools.

In Appendix 2 is given a list of insects observed or collected at LREC.

## Reptiles and Amphibians

The best time to search for reptiles and amphibians is in the early spring when Deer creek is still running and these animals are most active. During times of flooding of Deer Creek, however, some reptiles and amphibians may become extinct locally. Another factor which may limit the number of amphibians and reptiles at the site is that Deer Creek, except for a few isolated pools, dries up in the summertime. Reptiles and amphibians dependent on water at this time of year would die or be forced to withdraw to these few pools where they are subject to predation by fish such as the largemouth bass. Because the LREC is surrounded by suburbia it is unlikely that a species which becomes extinct at the site could re-invade from surrounding areas. Despite these potential threats, the LREC is a potentially good habitat for a number of different reptiles and amphibians, as it is for other kinds of animals, because of the diversity of habitats at the site.

A list of the amphibians and reptiles observed or likely to occur at LREC is given in Appendix 2. The observed reptiles and amphibians have been found during routine walks through the LREC. The only amphibia observed at the site in 1992 are the Eastern American toad and Blanchard’s cricket frog. Reptiles observed at the site include the three-toed box turtle, the blackrat snake, the

northern water snake (as a shed skin), and the eastern garter snake. A turtle, tentatively identified as a red-eared slider, was observed in mid-summer in the deep pool of Deer Creek across from the horse pasture.

There are a number of sampling methods which might reveal the presence of other amphibians or reptiles at the site. One of these is to place “snake boards” around the site. Snakes and other reptiles and some amphibians will sometimes hide under such boards. Seining of the deepwater pools of Deer Creek may result in the discovery of other reptiles or amphibians. Finally, it may be possible to build a drift fence for collection of amphibians or reptiles in migration.

## Birds

The LREC provides pleasant and varied birding opportunities in all seasons, but especially between April-May and September-October, the two peak periods for land bird migration in the St. Louis area. There are a variety of habitats at the site in which to observe birds including bottomland hardwood forest, woodland edge, prairie, and a riparian zone. The surrounding properties are suburban in character but well wooded and therefore good habitat for a number of characteristic Missouri woodland birds.

Bird species were actively recorded at the Litzsinger Road Ecology Center on 19 dates between March and November 1992 by William Rowe and Jack Van Benthuysen of the Webster Groves Nature Study Society. Dates on which the bird species were recorded are March 29, April 9, 12, and 26, May 8, September 6 and 19, October 3, 6, 8, 10, 12, 14, 16, and 17, November 4, 6, and 13. Each census took about an hour

and a half to two hours, usually in the morning since that is the best time for finding land birds. Results are tabulated below. For more complete coverage of the birds of Litzsinger Road additional observations should be made for mid- to late-spring migration, for the summer nesting season, and for midwinter.

Following is an overview of the birds observed at LREC, group by group, with an indication of other species common in the St. Louis region and to be expected at LREC, but which have not been recorded at the site.

**Water birds:** Only a few species of water birds have been recorded, most of them along Deer Creek. A Great Blue Heron *(Ardea herodias)* was seen on the first census, Green-backed Herons *(Butorides virescens),* Wood Ducks *(Aix sponsa)* and Mallards *(Anas platyrhynchos)* a few times, and Canada Geese *(Branta canadensis)* overhead. All of these are to be expected. Just one member of the shorebird family, a Common Snipe *(Capella gallinago),* has been found on one occasion, during October, but at least one other, the Killdeer *(Charadrius vociferus*), should appear at some point. Another water-related bird that appears to be resident along the creek, found on over half the censuses, is the Belted Kingfisher *(Ceryle alcyon).* Students might wish to follow a kingfisher in the spring and try to discover where it has dug its nest hole in the stream bank.

**Raptors:** Eleven of Missouri's birds of prey have been observed on or over the tract. Only one of them appears to be resident somewhere near the tract, if not on it, a Red-tailed Hawk *(Buteo jamaicensis),* the midwest's common large hawk. One or more Red-tails have appeared on most census dates, not high overhead but perched on the tract

itself or soaring low over it. The American Kestrel *(Falco sparverius),* a little falcon that is our commonest small raptor, has so far been observed only once, and only passing overhead; it should occur more often. An immature Red-shouldered Hawk *(Buteo lineatus),* a very uncommon species of moist woods, was observed sitting and calling loudly in the woods on September 6. Both of our usual species of Accipiter (stealthy woodland hawks that catch mainly birds) were present at LREC during the fall migration period, Cooper's Hawk *(Accipiter cooperi)* once and Sharp-shinned Hawk *(Accipiter striatus)* twice. A very uncommon migrant falcon, the Merlin *(Falco columbarius),* was observed perched on a tree in October.

Other raptors have been seen as they migrated overhead, a normal phenomenon all over our area (in fact, all over North America). These include a single Turkey Vulture *(Cathartes aura),* a single Bald Eagle *(Haliaeetus leucocephalus),* a single Northern Harrier *(Circus cyaneus),* and a few Broad-winged Hawks *(Buteo platypterus),* which often occur in large flocks in late September. All of these should be seen again. Bald Eagles, in particular, may soar over from time to time during the colder months.

Of our nocturnal raptors, only the Barred Owl *(Strix varia)* has been found so far, though the tract might be visited occasionally by Great Horned Owls *(Bubo virginianus),* and there could possibly be Eastern Screech Owls *(Otus asio)* resident nearby.

**Gallinaceous Birds:** There are four gallinaceous birds that occur in the St. Louis area. Of these, only the Wild Turkey has been observed at LREC.

**Doves:** Our ubiquitous native dove, the Mourning Dove

*(Zenaida macroura)* is common on the tract and was seen in small numbers on nearly every trip. The introduced Rock Dove, or city pigeon *(Columba livia),* has been observed at LREC, but less often than the Mourning Dove.

**Cuckoos:** Of the two cuckoo species that occur in eastern United States forests, one has been seen on the tract during spring migration, the Yellow-billed Cuckoo *(Coccyzus americanus),* which almost certainly will occur as a breeding bird too. The rather uncommon Black-billed Cuckoo *(Coccyzus erythropthalmus)* is to be expected as a migrant.

**Goatsuckers:** These bizarre birds are represented so far by one species, the Common Nighthawk (*Chordeiles minor*), which occurs as a migrant and undoubtedly as a visitor in the summertime skies, although absence of habitat (open gravel areas) would keep it from nesting on the tract. At some point a Whippoorwill (*Caprimulgus vociferus*) might be heard or flushed in the woods.

**Swifts:** Our only eastern swift, the Chimney Swift *(Chaetura pelagica),* nests in nearby chimneys as it does everywhere and is a common visitor overhead, April to October.

**Hummingbirds:** Our eastern Ruby-throated Hummingbird *(Archilocus colubris)* has been seen only in spring so far, but it probably nests on the tract. It is a summer resident statewide, including some suburban areas, but its populations fluctuate.

**Woodpeckers:** This well-known group of handsome, conspicuous birds has seven members in Missouri, all of which have occurred on the tract. Probable residents include the Downy

*(Picoides pubescens),* Hairy *(Picoides villosus),* and Red-bellied *(Melanerpes carolinus)* Woodpeckers, and the Northern Flicker *(Colaptes auratus).* Two others seen several times on the tract probably nest nearby; these are the Red-headed *(Melanerpes erythrocephalus)* and Pileated Woodpeckers *(Dryocopus pileatus),* the latter being one of our most spectacular local birds. The Yellow-bellied Sapsucker *(Sphyrapicus varius)* occurs in Missouri only as a migrant and uncommon winter resident; it has been observed at LREC in fall, but will also occur in spring.

The remainder of this account concerns the order of passerines, or perching birds, which includes most of what called "songbirds" or "land birds". Although are informally subdivided by group, mostly family, they all belong to the same order.

**Flycatchers:** Three kinds of flycatchers have been observed in spring and fall; they are probably summer residents on the property. These are the Eastern Wood-Pewee *(Contopus virens),* Great Crested Flycatcher *(Myiarchus crinitus),* and Eastern Phoebe *(Sayornis phoebe),* the latter arriving the earliest and departing the latest (March-October). In the confusing genus Empidonax, only the common migrant Least Flycatcher *(Empidonax minimus)* and, once, the Yellow-bellied Flycatcher *(Empidonax flaviventris)* have been spotted. These will recur regularly, and it is quite possible that Acadian Flycatchers *(Empidonax virescens)* will be found in summer in the forest along the creek, since that is their habitat as a Missouri breeding bird. The other two eastern species, the Willow *(Empidonax trailli)* and Alder *(Empidonax alnorum),* may occur as migrants, most likely in May. Two other flycatcher species should occur although they haven't been observed yet. These are the Eastern Kingbird *(Tyrannus*

*tyrannus),* a common summer resident of the area, and the strictly migrant Olive-sided Flycatcher *(Contopus borealis).*

**Swallows:** Only two of Missouri's six swallows have shown up during the censuses, the Barn Swallow *(Hirundo rustica)* and the Tree Swallow *(Tachycineta bicolor),* both of which should be seen regularly, at least high overhead. The other four should eventually be seen; these are the Rough-winged Swallow *(Stelgidopteryx serripennis),* the Bank Swallow *(Riparia riparia),* the Cliff Swallow *(Hirundo pyrrhonota),* and the Purple Martin (*Progne subis).* The latter is very likely to nest somewhere in the vicinity and fly over the tract regularly in summer.

**Corvids:** These crow-like birds are represented by two of Missouri's commonest permanent residents: the Blue Jay *(Cyanocitta cristata)* and the American Crow *(Corvus brachyrhynchos).* They have been spotted on every trip.

**Parids:** Two representatives of this group occur as permanent residents on the tract and have occurred on every census. These are the Carolina Chickadee *(Parus carolinensis)* and the Tufted Titmouse *(Parus bicolor).* Both are basically woodland birds but are active on all parts of the tract, with the chickadee about twice as numerous as the titmouse. Not too far to the north, in northern St. Louis Co. and in St. Charles Co., the Carolina Chickadee (a southern species) is replaced by the Black-capped Chickadee; the St. Louis area is the dividing line between their ranges. The chickadees on the Litzsinger tract are probably Carolinas.

**Nuthatches:** The White-breasted Nuthatch *(Sitta*

*carolinensis)* is undoubtedly a permanent resident here; it has been found many times, in small numbers. The northerly Red-breasted Nuthatch *(Sitta canadensis)* can be expected to appear once in a while on migration or in the winter.

**Creepers:** The only North American species, the Brown Creeper *(Certhia familiaris),* occurs as a moderately common migrant in the woods; a few probably winter, as they do in woods all over Missouri.

**Wrens:** The Carolina Wren *(Thryothorus ludovicianus)* is a year-round resident of the woods; its songs and calls, at least, were obvious on every census. In spring, summer, and fall it is joined by the very common House Wren *(Troglodytes aedon).* Two other wrens, so far, have occurred as migrants: the Winter Wren *(Troglodytes troglodytes),* a bird of woods and brushpiles, and the Sedge Wren *(Cistothorus platensis),* found in the dense grass of the prairie. This grass might well harbor a Marsh Wren *(Cistothorus palustris)* on occasion, and it is also possible that a Bewick's Wren *(Thryomanes bewickii)* might drop in during spring migration, although this species has become very scarce in the St. Louis area.

**Kinglets and Thrushes:** Three of our tiniest birds have been seen on the tract on migration; these are the Ruby-crowned Kinglet *(Regulus calendula),* the Golden-crowned Kinglet *(Regulus satrapa),* and the Blue-gray Gnatcatcher *(Polioptila caerulea).* Probably a few Golden-crowns, and possibly a Ruby-crown, will stay for all or part of the winter in the woods. The gnatcatcher is a common summertime resident of mature Missouri forest and therefore can be expected as a nesting bird on the tract (it requires full forest

conditions and does not nest in suburbs).

Of the thrush group, the Eastern Bluebird *(Sialia sialis)* has been seen spring and fall and might stay through the summer; the American Robin *(Turdus migratorius)* is found year-round; and two of the "spotted thrushes" have been seen on migration: the Hermit Thrush *(Catharus guttatus)* and the Swainson's Thrush *(Catharus ustulatus).* The other three spotted thrushes will certainly be found in May and September; these are the Wood Thrush *(Hylocichla mustelina),* the Gray-cheeked Thrush *(Catharus minimus),* and the Veery *(Catharus fuscescens).* It is possible that the Wood Thrush, the only thrush that nests in Missouri, might do so on the tract, although generally the bird needs larger mature woods.

**Mimids:** All three Missouri species are common on the tract: the Mockingbird *(Mimus polyglottus)* all year round near human habitation, and the Gray Catbird *(Dumatella carolinensis)* and Brown Thrasher *(Toxostoma rufum),* both of which are found in woods and shrubbery during the warmer months.

**Waxwings:** The only regular species here, the Cedar Waxwing *(Bombycilla cedrorum)* shows up unpredictably. It is likely at any time except midsummer, and possible even then.

**Starlings:** This old-world family is represented in America by the immigrant European Starling *(Sturnus vulgaris),* which is abundant almost everywhere. It is not related to the new-world blackbirds, though often grouped with them in field guides.

**Vireos:** All of our vireos are neotropical migrants, some

nesting in the state and others moving on further north. Only the abundant Red-eyed Vireo *(Vireo olivaceus)* and Warbling Vireo *(Vireo gilvus)* have been observed at LREC, but four of the other five local species should occur with regularity during migration. These are the Yellow—throated *(Vireo flavifrons),* Solitary *(Vireo solitarius),* White—eyed *(Vireo griseus),* and Philadelphia *(Vireo phiiadeiphicus)* Vireos. The least common species of vireo, the Bell's Vireo *(Vireo bellii),* is also a reasonable possibility. Of all these species, the Red-eyed is the most likely summer resident on the tract, in the forest proper.

**Warblers:** The warblers are by far our largest group of passerines, and also of neotropical migrants. About 35 species occur regularly at St. Louis, of which about 15 are nesting birds, resident in the summer. No warbler nests in subdivisions, however; they all require countryside with unspoiled natural habitats, which in many cases means a mature forest, although some of them live in shrubby or ground-hugging habitats. So far, only a minority of the species likely to visit the site have been observed. Additional censuses in mid to late-spring should reveal the presence of other warblers at LREC.

Most of the warblers observed at LREC were seen in trees and bushes; an exception is the Common Yellowthroat which occurs in the rank prairie grass. In the fall there may be other warblers foraging in the prairie, including the Orange-crowned Warbler. Most warblers will visit LREC during the height of spring migration (late April to late May) and again on fall migration (late August to early October). The Yellow-rumped Warbler is our only normally wintering warbler. A few warblers may breed on the tract including the Yellowthroat (grass), the Black-and-White

(forest), and the Louisiana Waterthrush (forested creek banks).

Warblers to be expected on the property, but which have not yet been recorded$_1$ are listed below. Those marked with an asterick (*) should be watched for in the summer as possible breeding birds.

| | |
|---|---|
| Blue-winged Warbler | Prothonotary Warbler* |
| Golden-winged Warbler | Worm-eating Warbler |
| Northern Parula* | Ovenbird |
| Yellow Warbler | Mourning Warbler |
| Cape May Warbler | Wilson’s Warbler |
| Yellow-throated Warbler* | Canada Warbler |
| Bay-breasted Warbler | Yellow-breasted Chat |
| Blackpoll Warbler | |

**Grosbeaks and Buntings:** Three of these colorful species occur commonly. The Northern Cardinal *(Richmondena cardinalis)* is one of the most conspicuous birds at all seasons; the Rose-breasted Grosbeak *(Pheucticus ludovicianus)* is a common migrant; and the Indigo Bunting *(Passerina cyanea)* is both a migrant and probably a summer resident. Juvenile and fall-plumaged Indigos are unstreaked little brown birds that can be abundant in the prairie grasses in October. Two other species that may appear on the tract are the Blue Grosbeak *(Guiraca caerulea)* and the Dickcissel *(Spiza americana).*

**Sparrows:** The Rufous-sided Towhee *(Pipilo erythrophthalmus),* in essence a large sparrow of the weeds and brush, has occurred on the tract and may nest. One other sparrow-like small bird, the Dark-eyed Junco *(Junco hyemalis),* is a common visitor in late fall, winter, and spring, as it is everywhere in Missouri. Besides these two

quasi-sparrows, there have been observed ten actual sparrow species on the tract so far; others are possible. They tend to arrive in October and November, after the neotropical migrants like the warblers are mostly gone. Most of the sparrows are migrants too but do not leave North America; some of them spend the winter here. The combination of woods, woodland edge, dense grass, shrubbery, and brushpiles makes the area excellent habitat for a diversity of sparrows. The only certain summer resident is the Song Sparrow *(Melospiza melodia),* which is undoubtedly common every month of the year; the Chipping Sparrow *(Spizella passerina)* could possibly nest too, but so far has been observed only as a migrant. Notable for their numbers in fall are the White-throated Sparrow *(Zonotrichia albicollis)* and the Swamp Sparrow *(Melospiza georgiana),* which rival the Song Sparrow in abundance. In smaller numbers are the Fox Sparrow *(Passerella iliaca),* the White-crowned Sparrow *(Zonotrichia leucophrys),* the Field Sparrow *(Spizella pusilla),* and the Savannah Sparrow *(Passerculus sandwichensis).* Two species often missed by birdwatchers because of their skulking habits are the Lincoln’s Sparrow *(Melospiza lincolnii),* which has been observed in groups of as many as five and, even harder to find and observe, the LeConte’s Sparrow *(Ammodramus leconteii),* a migrant bird of densely matted prairies and meadows. A single LeConte’s was seen in the prairie grass in early November. There is a high probability that several other species will occur, including the American Tree Sparrow *(Spizella arborea)* in late fall and winter, the Vesper Sparrow *(Pooecetes gramineus)* as a mid-spring or mid-fall migrant in the grassy sections, the Grasshopper Sparrow *(Ammodramus savannarum)* in dense grass like the LeConte’s, and possibly the Lark Sparrow *(Chondestes grammacus).* An additional four or five

rare species could also show up.

**Icterids:** This varied group contains some of our most abundant birds, some of which have been recorded repeatedly on the tract. These include the Red-winged Blackbird *(Agelaius phoeniceus)* and Common Grackle *(Quiscalus quiscula),* both of which have been seen on just about every census, and the Brown-headed Cowbird *(Molothrus ater).* All three are probably nesting birds on or near the tract; the cowbird is well-known as our only parasitic bird. Other species which have been observed at LREC are the Rusty Blackbird *(Euphagus carolinensis),* which should certainly recur in fall, winter, and spring, especially in the woods along the creek, the Northern (Baltimore) Oriole *(Icterus galbula),* which is almost certainly a nesting bird, and the Eastern Meadowlark *(Sturnella magna).* Additionally, the Orchard Oriole *(Icterus spurius)* should occur on migration.

**Fringillids:** This group comprises the “winter finches” and a couple of others, which are superficially much like the sparrows and buntings but are not closely related to them. Observed at the site are the winter resident Purple Finch *(Carpodacus purpureus)* in small numbers and, more commonly and in larger numbers, the House Finch *(Carpodacus mexicanus).* The latter bird, though originally restricted to western North America, has colonized St. Louis from the east as part of a tremendous population explosion stemming from a few birds released in New York in the 1940’s. During the past six or seven years House Finches have become common around our area, and it is no surprise that they are regular on the tract; most likely they nest in nearby yards. The American Goldfinch *(Carduelis tristis)* is another of the most reliably common birds on the tract, seen on every

census, and in especially large numbers in the prairie section in fall (sometimes 100 or more). Its more northerly cousin, the Pine Siskin *(Carduelis pinus),* is a moderately common but erratic bird in fall, winter, and spring; In 1992 it was seen on the tract earlier than it often arrives at St. Louis (in early October). Possible visitors to the site but which haven't been seen are the Common Redpoll *(Carduelis flammea),* likely to be gleaning weed seeds with the goldfinches during the coldest months, the Evening Grosbeak *(Coccothraustes vespertinus),* and the Red Crossbill *(Loxia curvirostra).* The latter two birds may be located in sycamore or ash trees, in conifers, or at neighboring feeders.

**Weavers, or Old World sparrows:** One of our two species in this group is the all-too-well-known House Sparrow *(Passer domesticus),* a non-native, introduced bird that long ago became abundant across North America. It is resident on the tract, mostly around the stable and the nearby homes. Its cousin, the Eurasian Tree Sparrow *(Passer montanus)*, is St. Louis' main claim to ornithological fame: it was introduced here in the 1870's, survived and spread a bit into neighboring counties on both sides of the river, and remains in fair numbers to this day. Its population has never exploded like the House Sparrow's, and it has never pushed its limits beyond the bi-state area, although it extends as far as Springfield, Illinois, and shows some recent signs of invading Iowa. The prairie and surrounding shrubbery harbor a sizeable group of "ETS", as local birders call them. The Eurasian Tree Sparrow was found on almost every trip, usually in a cohesive single flock numbering as many as 40 to 60 birds.

This account of just over 100 species recorded at LREC must be considered preliminary. Two or three good censuses at the height of spring migration will probably add another twenty or thirty birds to the list; continued regular observation will gradually build the list further. A list of birds observed at the site in 1992 is given in Appendix 4.

## Mammals

The prairie and forest at LTER are good habitat for a number of different kinds of mammals. The proximity of surface water is an additional factor that would help to attract mammals to the site.

Mammals were actively trapped on the site on only one occasion. The trapping was conducted by Dr. William Bethel of Lindenwood College with help from his students. Twenty five baited (peanut butter and oatmeal) Sherman live traps (7.6 X 8.8 X 22.5 cm) were placed within the prairie; another 25 traps were placed in the adjacent forest. One additional large trap (32 X 10 X 12 cm) was placed in each area. The traps were set on the morning of October 29, 1992 and checked on the mornings of the following two days.

Unfortunately, only three mammals were trapped: one opossum, one deer mouse, and one other field mouse, identifiable only as *Peromyscus* sp., the latter mouse having been partially devoured. All of these animals were trapped in the prairie area.

The poor trapping success can be explained partly by the prevailing weather conditions consisting of cold temperatures and heavy rains. Several of the traps appear to have been disturbed by raccoons, having been sprung and missing bait. Raccoons have been observed at the site.

Dr. Bethel has conducted extensive trapping at the Welden Spring Wildlife area and at Lindenwood College. The Lindenwood College property is similar to the LREC in that both are surrounded by residential property. Based on observations made at these sites, Dr. Bethel suspects, in addition to the mammals caught, the presence at LREC of the white-footed mouse *(P. leucopus),* the harvest mouse *(Reithnodontomys megalotus),* and the prairie vole *(Microtus orchrogaster).*

According to Schwartz and Schwartz (1981), the deer mouse is common in open areas such as prairies, agricultural fields and forest edges, whereas the white—footed mouse is chiefly a forest dweller. The harvest mouse prefers areas with shrubby vegetation such as old fields and the edge of lakes.

Other mammals which have been observed at the LREC in 1992 are the eastern grey squirrel and the white-tailed deer. The presence of a large number of eastern and perhaps star-nosed moles is indicated by the numerous mole holes in the soil of the prairie which are particularly evident after the prairie is burned. Coyote have not been seen at the site but are said to have been heard.

In appendix 5 is given a list of the mammals observed or expected at LREC.

## Suggestions for management

### Management for enhancement of biological diversity

There is good potential for restoring or recreating relatively high quality native system fragments of several different communities at LREC. The site has a matrix of over 250 native vascular plants but these exist in an array with approximately 90 introduced vascular plant species.

The vast majority of the native plant species on the site are nonconservative. To enhance biological diversity at LREC weedy adventives such as *Humulus japonicus, Euonymus fontunei, Alliaria petiolata,* and *Lonicera japonica,* will need to be controlled and eventually eliminated, and conservative plant species will need to be introduced. The effort to introduce conservative plant species is presently underway in the restored prairie and certainly should be continued and expanded to the forest. Consultation of literature which describes presettlement vegetation and plant communities may serve as a useful guide for reintroduction. (e.g. Schroeder 1981).

There are also a number of ways in which habitat diversity can be created at the site to enhance biological diversity of both plants and animals. For example, removal of the drainage system at the northern corner of the prairie should be considered as a means of creating a saturated lowland with different vegetation and fauna than in the drier regions of the prairie. A woodland marsh might be created in the forest behind the cabin by building dikes in the old stream channels which cut through this region of the forest. Dikes would serve to retain runoff of water through these channels eventually allowing for flooding of part of the forest. For control of water depth and area under water the dikes could be gated. An additional advantage of placing dikes across these drainages is that erosion will be slowed.

A pond at the site would provide another kind of habitat diversity. A good location f or a pond might be at the base of the valley at the western corner of the property. It appears there was a pond at this location at a prior time. The size and depth of the pond should be evaluated according to the types of organisms the pond is

meant to harbor. To sustain fish the pond will need to be at least 6 feet deep over much of it's area. For introduction of native wetland species it may be better to have a shallower pond (less than 3 feet deep). In a shallow wetland, mosquitos may be a problem. The problem can be addressed by hanging bat boxes to promote colonization of the site by bats, or by stocking the pond with a fish which eats mosquito larvae such as *Gambusia* sp. On the other hand, for the pond to be good habitat for amphibians and many reptiles, it should be fishless.

Introduction of certain kinds of plants can be used to enhance wildlife habitat. For example, winterberry *(Ilex verticillata),* elderberry *(Sambucus canadensis),* and deciduous holly *(Ilex decidua)* produce edible fruits which may be utilized by birds. Red buckeye trees *(Aesculus pavia)* and touch-me-nots *(Impatiens capensis)* are excellent plants for attracting hummingbirds. Evergreens (our only native evergreen is the eastern red cedar, *Juniperus vinginiana)* provide both food and cover for birds. Buttonbush *(Cephalanthus occidentalis)* is a good source of nectar for attracting butterflies.

Nestboxes can be constructed and placed in order to attract certain kinds of birds such as chickadees and wrens. The bluebird boxes previously placed at the site have been utilized as nesting sites for these birds.

Finally, there is ecological and historical evidence that frequent landscape fires were an integral factor in shaping and maintaining the character of presettlement vegetation. Douglas Ladd of the Nature Conservancy suggests that periodic prescribed burning of both the woodland as well as the prairie be considered as a means of establishing and maintaining a remnant of native vegetation at LREC.

**Management for protection of trails**

Damage or excessive erosion to the trails may become a problem with an increase of visitation combined with horseback riding along trials at the site. At some point it may be necessary to put wood chips on the trials to help protect them from being worn down. Where the trials are somewhat steep it may be necessary to build steps. For example, the trial leading up to the right-of-way on the north corner of the property makes a good conduit for water and is showing signs of erosion. Erosion may be accelerated by heavy use unless some kind of stabilizing structures, such as steps, are installed. Whether the site can withstand disturbance due to both an increase in foot traffic and a continuation of horseback riding should be evaluated.

If there is to be heavy traffic across the stream it may be advisable to put in a bridge. A bridge would protect the stream bed from major traffic and make the northern half of the property accessible for school groups when the water is high.

## Description of grid lay-out and natural features map

In order to facilitate mapping of the natural features of LREC and to help establish and locate plots for possible long-term studies, a permanent grid was laid out over the entire property of the LREC in 1992. The initial grid, using temporary wooden stakes, was established by Harrison and Associates Consulting of St. Peters. Missouri. Stakes were set into the ground every 15 m over the property, excluding the bed of Deer Creek, residential areas, and the horse pasture. The temporary markers were later replaced with permanent markers by Clifford Ochs. The permanent

markers, 18-inch long galvanized steel pipe, were placed into the ground with 3-6 inches of length exposed. The exposed ends of the markers were painted red to help find their location. Aluminum tags with the grid location stamped on were attached to each marker. The grid locations correspond to a map of the site showing the grid which was provided by Harrison and Associates.

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## Appendix 1: Plants of the Litzsinger Road Ecology Center

The following list of plants was compiled from the Litzsinger Road Ecology Center site from April through October 1992. Plant names are included on the list if the species was observed at the site, whether or not it was collected. All collections were verified by Douglas Ladd of the Missouri Nature Conservancy or George Yatskievych of the Missouri Botanical Garden. Most of the plants that were observed but not collected were verified in the field by Douglas Ladd. In addition, there are some plants on the list that were seeded or introduced as transplants to the site by Bill Davit but were not observed.

Collected plants and information necessary for the preparation of herbarium labels have been provided to George Yatskievych.

**Key to abbreviations on the plant list:**

| Heading | Denotes |
|---|---|
| * | A * following the plant scientific name denotes a species that had been introduced to the property as seed or transplant, but was not collected or observed. |
| CofC | Coefficient of Conservatism. A number used by the Nature Conservancy to indicate to what degree a plant is considered conservative, i.e. restricted to particular native habitats. Only native plants receive a CofC. For more information refer to Wilhelm and Ladd (1988). |
| FLR | Primary flowering period of plant. |
| LOC | Primary location were plant occurs. d=disturbed areas (primarily mowed areas), r=riparian, p=prairie, f=forest. |
| RA | Relative abundance. Plants are listed as a=abundant (plentiful throughout much of the site), c=common (common throughout much of the site but less so than the plants listed as abundant, o=occasional (occurs in limited abundance in restricted areas; r=rare (only a few individuals observed at the site). |
| HAB | Habit. Denotes whether a plant is a tree, shrub, vine, forb, grass, sedge, or fern. |
| No. | Denotes the collection number of the plant specimen. |

## Appendix 1: Plants of the Litzsinger Road Ecology Center , 1992

| No. | Scientific Name | Common Name | Family | CofC | FLR | LOC | RA | HAB |
|---|---|---|---|---|---|---|---|---|
| 274 | Acalypha rhomboidea | three-seeded mercury | Euphorbiaceae | 0 | fall | r | o | forb |
| 38 | Acer negundo | box elder | Aceraceae | 1 | spr | f | c | tree |
| 71 | Acer saccharinum | silver maple | Aceraceae | 1 | spr | f | c | tree |
| 98 | Achillea millefolium | yarrow | Asteraceae | | sum | p | c | forb |
| 41 | Aesculus glabra | Ohio buckeye | Hippocastanaceae | 5 | spr | f | o | shrub |
| | Ailanthus altissima | tree-of-heaven | Simaroubaceae | | spr | r | | tree |
| 49 | Alliaria petiolata | garlic mustard | Brassicaceae | | spr | d | o | forb |
| | [A. officinalis] | | | | | | | |
| 73 | Allium canadense | wild garlic | Liliaceae | 1 | spr | d | c | forb |
| 103 | Allium vineale | field garlic | Liliaceae | | sum | d | o | forb |
| 273 | Amaranthus hybridus | green amaranth | Amaranthaceae | | fall | r | o | forb |
| 243 | Amaranthus rudis | water hemp | Amaranthaceae | 0 | sum | r | c | forb |
| | [A. tamariscinus] | | | | | | | |
| 237 | Ambrosia artemisiifolia | common ragweed | Asteraceae | 0 | sum | r | o | forb |
| 230 | Ambrosia trifida | giant ragweed | Asteraceae | 0 | sum | d | c | forb |
| | Amorpha canescens | lead plant | Fabaceae | 8 | sum | p | | shrub |
| | Amorpha fruticosa* | false indigo | Fabaceae | 5 | spr | | | shrub |
| 144 | Ampelopsis cordata | racoon grape | Vitaceae | 4 | sum | f | c | vine |
| 209 | Andropogon gerardii | big bluestem | Poaceae | 5 | sum | p | c | grass |
| | Apios americana | groundnut | Fabaceae | 6 | sum | f | o | vine |
| 166 | Apocynum sibiricum | dogbane | Apocynaceae | 2 | sum | p | c | forb |
| 30 | Arabis shortii var. phalacrocarpa | toothed cress | Brassicaceae | 6 | spr | f | o | forb |
| | Arctium minus | common burdock | Asteraceae | | sum | d | | forb |
| | Arisaema dracontium | green dragon | Araceae | 6 | spr | f | r | forb |
| 56 | Asarum canadense | wild ginger | Aristolochiaceae | 6 | spr | f | o | forb |
| 210 | Asclepias incarnata | swamp milkweed | Asclepiadaceae | 5 | sum | p | o | forb |
| | Asclepias sullivantii | prairie milkweed | Asclepiadaceae | 9 | sum | p | | forb |
| 165 | Asclepias syriaca | common milkweed | Asclepiadaceae | 0 | sum | p | c | forb |
| 174 | Asclepias tuberosa | butterfly weed | Asclepiadaceae | 5 | sum | p | o | forb |
| 61 | Asimina triloba | pawpaw | Annonaceae | 5 | spr | f | o | tree |
| 279 | Aster drummondii | Drummond aster | Asteraceae | 4 | fall | f/d | c | forb |
| | Aster laevis* | smooth aster | Asteraceae | 7 | fall | | | forb |
| 280 | Aster lateriflorus | white woodland aster | Asteraceae | 3 | fall | f/d | o | forb |
| 198 | Aster novae-angliae | New England aster | Asteraceae | 4 | sum | p | c | forb |
| | Aster oblongifolius | aromatic aster | Asteraceae | 6 | fall | p | o | forb |
| 258 | Aster pilosus | white heather aster | Asteraceae | 0 | fall | p | o | forb |
| | Baptisia alba var. macrophylla | wild white indigo | Fabaceae | 6 | sum | p | | forb |
| | [B. leucantha] | | | | | | | |
| | Baptisia bracteata var. glabrescens | cream white indigo | Fabaceae | 6 | spr | p | | forb |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | [B. leucophaea] | | | | | | | |
| 26 | Barbarea vulgaris | yellow rocket | Brassicaceae | | spr | d | c | forb |
| | Betula nigra | river birch | Betulaceae | 3 | spr | f | o | tree |
| | Bidens tripartita | swamp beggar ticks | Asteraceae | 3 | sum | f/r | | forb |
| | [B. comosa (A.Gray)Wieg] | | | | | | | |
| 263 | Bidens vulgata | beggar ticks | Asteraceae | 3 | fall | f | r | forb |
| | Boehmeria cylindrica | false nettle | Urticaceae | 4 | sum | f | | forb |
| | Boltonia asteroides* | false aster | Asteraceae | 5 | sum | | | forb |
| | Bouteloua curtipendula | sideoats grama | Poaceae | 7 | sum | p | | grass |
| 269 | Bromus pubescens | Canada brome | Poaceae | ? | fall | p | c | grass |
| | Bromus racemosus | hairy chess | Poaceae | | sum | d | | grass |
| | [B. mollis] | | | | | | | |
| 84 | Bromus sterilis | poverty brome | Poaceae | | spr | d | o | grass |
| 68 | Bromus tectorum | downy brome | Poaceae | | spr | d | o | grass |
| 89 | Buglossoides arvense | corn gromwell | Boraginaceae | | spr | r | o | forb |
| | [Lithospermum arvense] | | | | | | | |
| 227 | Cacalia atriplicifolia | pale Indian plantain | Asteraceae | 4 | sum | d | o | forb |
| 147 | Calystegia sepium | hedge bindweed | Convolvulaceae | 1 | sum | p/d | c | vine |
| | [Convolvulus sepium] | | | | | | | |
| 183 | Campanula americana | tall bellflower | Campanulaceae | 4 | sum | r | c | forb |
| 178 | Campsis radicans | trumpet creeper | Bignoniaceae | 3 | sum | f/d | o | vine |
| 24 | Capsella bursa-pastoris | shepherd's purse | Brassicaceae | | spr | d | c | forb |
| 9 | Cardamine concatenata | toothwort | Brassicaceae | 4 | spr | f | o | forb |
| | [Dentaria laciniata] | | | | | | | |
| 29 | Cardamine hirsuta | hoary bitter cress | Brassicaceae | | spr | f | o | forb |
| 124 | Carduus nutans | nodding thistle | Asteraceae | | sum | p | o | forb |
| 128 | Carex annectens | yellow-fruited sedge | Cyperaceae | 4 | sum | p | o | sedge |
| 37 | Carex blanda | wood sedge | Cyperaceae | 3 | spr | d | o | sedge |
| 129 | Carex frankii | Frank's sedge | Cyperaceae | 5 | sum | p | o | sedge |
| | Carex jamesii | grass sedge | Cyperaceae | 5 | sum | f | | sedge |
| 110 | Carex shortiana | Short's sedge | Cyperaceae | 4 | sum | p/d | o | sedge |
| 51 | Carex sparganioides | bur-reed sedge | Cyperaceae | 6 | spr | d | a | sedge |
| | Carya cordiformis | bitternut hickory | Juglandaceae | 5 | spr | f | o | tree |
| | Carya illinoensis | pecan | Juglandaceae | 6 | spr | r | r | tree |
| | Carya ovata | shagbark hickory | Juglandaceae | 4 | spr | f | o | tree |
| 278 | Catalpa speciosa | northern catalpa | Bignoniaceae | 2 | spr | r | o | tree |
| | Celtis occidentalis | northern hackberry | Ulmaceae | 4 | spr | f | o | tree |
| | Cerastium fontanum | mouse-eared chickweed | Caryophyllaceae | | spr-fall | d | | forb |
| | [Cerastium vulgatum] | | | | | | | |
| 32 | Cerastium glomeratum | clammy chickweed | Caryophyllaceae | | spr | d | a | forb |
| | [Cerastium viscosum] | | | | | | | |
| 42 | Cercis canadensis | eastern redbud | Caesalpiniaceae | 3 | spr | f | r | tree |
| 16 | Chaerophyllum procumbens | wild chervil | Apiaceae | 0 | spr | f | c | forb |
| 236 | Chamaesyce maculata | milk purslane | Euphorbiaceae | 0 | sum | r | o | forb |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | [Euphorbia supina] | nodding spurge | Euphorbiaceae | 0 | sum | r | o | forb |
| 212 | Chamaesyce nutans | | | | | | | |
| | [Euphorbia maculata] | pigweed | Chenopodiaceae | | fall | r | o | forb |
| 271 | Chenopodium album | Mexican tea | Chenopodiaceae | | fall | d | | forb |
| | Chenopodium ambrosioides | common chickory | Asteraceae | | sum | d | o | forb |
| 194 | Cichorium intybus | enchanter's nightshade | Onacraceae | 1 | sum | f | | forb |
| | Circaea lutetiana ssp. canadensis | | | | | | | |
| | [C. quadrisulcata] | field thistle | Asteraceae | 3 | fall | p/d | o | forb |
| 253 | Cirsium discolor | bull thistle | Asteraceae | | sum | p | o | forb |
| 203 | Cirsium vulgare | spring beauty | Portulacaceae | 3 | spr | f | c | forb |
| 5 | Claytonia virginica | common dayflower | Commelinaceae | | sum | d | | forb |
| | Commelina communis | Canada fleabane | Asteraceae | 0 | sum | d | a | forb |
| 248 | Conyza canadensis | | | | | | | |
| | [Erigeron canadensis] | plains coreopsis | Asteraceae | 6 | spr | p | | forb |
| | Coreopsis palmata | star tickseed | Asteraceae | 5 | fall | r | r | forb |
| 277 | Coreopsis pubescens | plains coreopsis | Asteraceae | 2 | sum | p | o | forb |
| 218 | Coreopsis tinctoria | tall tickseed | Asteraceae | 6 | sum | p | o | forb |
| 181 | Coreopsis tripteris | rough-leaved dogwood | Cornaceae | 1 | sum | f | o | tree |
| 115 | Cornus drummondii | flowering dogwood | Cornaceae | 5 | spr | f | r | tree |
| | Cornus florida | gray dogwood | Cornaceae | 6 | spr | r | r | tree |
| | Cornus foemina ssp. racemosa | | | | | | | |
| | [C. racemosa] | pale corydalis | Fumariaceae | 3 | spr | f | o | forb |
| 17 | Corydalis flavula | Walter | Betulaceae | 2 | spr | f | o | tree |
| | Corylus americana | hawthorn | Rosaceae | ? | | f | o | tree |
| | Crataegus sp. | sand croton | Euphorbiaceae | 1 | sum | p/d | | forb |
| | Croton glandulosus v. septentrionalis | honeywort | Apiaceae | 2 | sum | f/d | o | forb |
| 113 | Cryptotaenia canadensis | yellow-flowered gourd | Cucurbitaceae | | fall | d | o | vine |
| | Cucurbita pepo var. ovifera | field dodder | Cuscutaceae | 5 | sum | r | o | vine |
| 219 | Cuscuta pentagona | climbing milkweed | Asclepiadaceae | 1 | sum | p | c | vine |
| 156 | Cynanchum laeve | Bermuda grass | Poaceae | | sum | d | | grass |
| | Cynodon dactylon | yellow nut grass | Cyperaceae | 1 | sum | p/d | | sedge |
| | Cyperus esculentus | straw-colored flatsedge | Cyperaceae | 1 | sum | p | o | sedge |
| 179 | Cyperus strigosus | bladder fern | Polypodiaceae | 5 | sum | f | o | fern |
| 101 | Cystopteris fragilis s.l. | orchard grass | Poaceae | | spr | d | c | grass |
| 64 | Dactylis glomerata | purple prairie clover | Fabaceae | 8 | sum | p | | forb |
| | Dalea purpurea | | | | | | | |
| | [Petalostemon purpureum] | wild carrot | Apiaceae | | sum | p/d | c | forb |
| 153 | Daucus carota | Carolina larkspur | Ranunculaceae | | spr | p | | forb |
| | Delphinium carolinianum | prairie mimosa | Fabaceae | 3 | sum | p | c | forb |
| 163 | Desmanthus illinoensis | panicled tick trefoil | Fabaceae | 3 | sum | f/r | | forb |
| | Desmodium paniculatum | beggar's lice | Fabaceae | | sum | d | o | forb |
| 225 | Desmodium perplexum | Deptford pink | Caryophyllaceae | | sum | d | o | forb |
| 122 | Dianthus armeria | deer tongue grass | Poaceae | 4 | sum-fall | d | | grass |
| | Dichanthelium clandestinum | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | [Panicum clandestinum] | | | | | | | |
| 192 | Digitaria sanguinalis | crab grass | Poaceae | | sum | r | o | grass |
| | Diospyros virginiana | persimmon | Ebenaceae | 3 | spr | f | o | tree |
| 27 | Duchesnea indica | Indian strawberry | Rosaceae | | spr | d | o | forb |
| | Echinacea pallida | pale purple coneflower | Asteraceae | 7 | sum | p | | forb |
| | Echinacea purpurea | purple coneflower | Asteraceae | 5 | sum | p | | forb |
| 191 | Echinochloa crusgalli | barnyard grass | Poaceae | | sum | r | o | grass |
| 211 | Eclipta prostrata | yerba de tajo | Asteraceae | 3 | sum | r | o | forb |
| | [E. alba] | | | | | | | |
| 190 | Eleusine indica | goose grass | Poaceae | | sum | r | o | grass |
| 43 | Ellisia nyctelea | Aunt Lucy | Hydrophyllaceae | 1 | spr | f | c | forb |
| 268 | Elymus canadensis | Canada wild rye | Poaceae | 5 | fall | p | c | grass |
| | Elymus virginicus | wild rye | Poaceae | 4 | sum | p/f | | grass |
| | Eragrostis pectinacea | Carolina love grass | Poaceae | 0 | sum | d | | grass |
| | Erechtites hieracifolia | fireweed | Poaceae | 2 | sum-fall | d | | grass |
| 99 | Erigeron annuus | daisy fleabane | Asteraceae | 1 | sum | p | a | forb |
| 46 | Erigeron philadelphicus | Philadelphia fleabane | Asteraceae | 3 | spr | r/d | c | forb |
| 221 | Eryngium yuccifolium | rattlesnake master | Apiaceae | 8 | sum | p | o | forb |
| | Euonymus fortunei | wintercreeper | Celastraceae | | sum | f | a | vine |
| 132 | Euonymus atropurpureus | wahoo | Celastraceae | 5 | sum | f | r | shrub |
| 255 | Eupatorium rugosum | white snakeroot | Asteraceae | 2 | fall | p/d | o | forb |
| 214 | Eupatorium serotinum | late boneset | Asteraceae | 1 | sum | p | o | forb |
| | Festuca pratensis | meadow fescue | Poaceae | | sum | d | | grass |
| | [F. elatior] | | | | | | | |
| 75 | Festuca subverticillata | nodding fescue | Poaceae | 4 | spr | d | c | grass |
| | [Festuca obtusa] | | | | | | | |
| | Fraxinus pennsylvanica | green ash | Oleaceae | 2 | spr | f/r | o | tree |
| 58 | Galium aparine | annual bedstraw | Rubiaceae | 0 | spr | f/d | a | forb |
| 112 | Galium concinnum | shining bedstraw | Rubiaceae | 4 | sum | d | o | forb |
| | Geranium carolinianum | Carolina cranesbill | Geraniaceae | 0 | sum | d | o | forb |
| 47 | Geranium maculatum | wild geranium | Geraniaceae | 5 | spr | f/d | o | forb |
| 140 | Geum canadense | white avens | Rosaceae | 2 | sum | d | c | forb |
| 7 | Glechoma hederacea | gill-over-the-ground | Lamiaceae | | spr | d | a | forb |
| | Gleditsia triacanthos | honey locust | Caesalpiniaceae | 2 | spr | f | o | tree |
| | Glyceria striata | fowl manna grass | Poaceae | 4 | spr | p/d | | grass |
| | Hackelia virginiana | stickseed | Boraginaceae | 3 | sum | f/d | | forb |
| 264 | Helianthus maximilianii | Maximilian sunflower | Asteraceae | 5 | fall | p | c | forb |
| | Helianthus mollis | ashy sunflower | Asteraceae | 6 | sum | p | o | forb |
| | Helianthus strumosus | pale-leaved sunflower | Asteraceae | 4 | sum | p | o | forb |
| 232 | Helianthus tuberosus | Jerusalem artichoke | Asteraceae | 3 | sum | r | o | forb |
| | Heliopsis helianthoides | ox-eye | Asteraceae | 5 | sum | d | o | forb |
| 76 | Hesperis matronalis | dame's rocket | Brassicaceae | | spr | d | o | forb |
| 231 | Humulus japonicus | Japanese hops | Cannabaceae | | sum | p/r | a | vine |
| 65 | Hydrophyllum virginianum | Virginia waterleaf | Hydrophyllaceae | 4 | spr | f | o | forb |

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|---|---|---|---|---|---|---|---|---|
| | Hypericum mutilum | dwarf St.John's-wort | Clusiaceae | 4 | sum | p | | forb |
| | Impatiens balsamina | garden balsam | Balsaminaceae | | sum | r | r | forb |
| 169 | Impatiens capensis | spotted touch-me-not | Balsaminaceae | 3 | sum | r/d | c | forb |
| 155 | Ipomoea hederacea | blue morning glory | Convolvulaceae | | sum | d | o | vine |
| 6 | Isopyrum biternatum | false rue anemone | Ranunculaceae | 5 | spr | f | c | forb |
| | Juglans nigra | black walnut | Juglandaceae | 4 | spr | f | o | tree |
| | Juncus tenuis | path rush | Juncaceae | 0 | sum | d | | forb |
| 141 | Justicia americana | water willow | Acanthaceae | 5 | sum | r | o | forb |
| | Koeleria pyramidata* | June grass | Poaceae | 6 | sum | | | grass |
| | [K. cristata] | | | | | | | |
| | Kummerowia stipulacea | Korean bush clover | Fabaceae | | sum | d | | forb |
| | [Lespedeza stipulacea] | | | | | | | |
| 182 | Lactuca canadensis | wild lettuce | Asteraceae | 2 | sum | d | o | forb |
| 257 | Lactuca floridana | Florida lettuce | Asteraceae | 3 | fall | p/d | o | forb |
| 161 | Lactuca serriola | prickly lettuce | Asteraceae | | sum | d | o | forb |
| 11 | Lamium amplexicaule | henbit | Lamiaceae | | spr | d | a | forb |
| 2 | Lamium purpureum | dead nettle | Lamiaceae | | spr | d | a | forb |
| 200 | Laportea canadensis | wood nettle | Urticaceae | 4 | sum | f | a | forb |
| 148 | Lathyrus latifolius | everlasting pea | Fabaceae | | sum | d | o | vine |
| | Leersia virginica | white grass | Poaceae | 4 | sum | f | | grass |
| | Lepidium virginicum | pepper grass | Brassicaceae | 0 | spr-fall | r | o | forb |
| | Lespedeza capitata* | roundhead bush clover | Fabaceae | 6 | sum | | | forb |
| | Liatris pycnostachya | blazing star | Asteraceae | 6 | sum | p | | forb |
| | Liatris aspera* | blazing star | Asteraceae | 6 | fall | | | forb |
| | Liatris ligulistylis | blazing star | Asteraceae | 9 | sum | p | | forb |
| 104 | Ligustrum obtusifolium | border privet | Oleaceae | | sum | r | o | shrub |
| 184 | Lobelia inflata | Indian tobacco | Campanulaceae | 3 | sum | f/d | r | forb |
| | Lonicera japonica | Japanese honeysuckle | Caprifoliaceae | | spr | d | c | vine |
| 152 | Lonicera maackii | bush honeysuckle | Caprifoliaceae | | sum | f/d | a | shrub |
| 180 | Ludwigia alternifolia | bushy seedbox | Onagraceae | 4 | sum | p | o | forb |
| 168 | Ludwigia peploides | floating primrose willow | Onagraceae | 3 | sum | r | r | forb |
| | [Jussiaea repens L.] | | | | | | | |
| 119 | Lysimachia nummularia | moneywort | Primulaceae | | sum | f/d | o | forb |
| 127 | Lythrum alatum | winged loosestrife | Lythraceae | 6 | sum | p | c | forb |
| 34 | Malus ioensis | prairie crab apple | Rosaceae | 3 | spr | f | r | tree |
| | [Pyrus ioensis] | | | | | | | |
| 105 | Matricaria recutita | wild chamomile | Asteraceae | | sum | r | o | forb |
| | [M. chamomilla] | | | | | | | |
| 135 | Melilotus albus | white sweet clover | Fabaceae | | sum | r | o | forb |
| 93 | Melilotus officinale | yellow sweet clover | Fabaceae | | sum | r | o | forb |
| 20 | Mertensia virginica | bluebells | Boraginaceae | 6 | spr | f | o | forb |
| 157 | Mollugo verticillata | carpetweed | Molluginaceae | | sum | d | o | forb |
| | Monarda bradburiana | beebalm | Lamiaceae | 7 | sum | p | | forb |
| 172 | Monarda fistulosa | wild bergamot | Lamiaceae | 4 | sum | p | a | forb |

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|---|---|---|---|---|---|---|---|---|
| | Morus alba | white mulberry | Moraceae | | spr | p | o | tree |
| | Morus rubra | red mulberry | Moraceae | 4 | spr | p/f | o | tree |
| | Muhlenbergia sobolifera | rock muhly | Poaceae | 4 | sum | f | | grass |
| 197 | Oenothera biennis | evening primrose | Onagraceae | 0 | sum | p | c | forb |
| | Oenothera laciniata | ragged evening primrose | Onagraceae | 1 | sum | d | | forb |
| | Oenothera macrocarpa | Missouri primrose | Onagraceae | ? | | p | | forb |
| 25 | Ornithogalum umbellatum | star of Bethlehem | Liliaceae | | spr | f/d | c | forb |
| 45 | Osmorhiza claytonii | sweet cicely | Apiaceae | 3 | spr | f | c | forb |
| | Ostrya virginiana | eastern hop hornbeam | Betulaceae | 4 | spr | f | r | tree |
| 77 | Oxalis stricta or florida? | yellow wood sorrel | Oxalidaceae | 0 | spr | d | c | forb |
| | [O. dillenii] | | | | | | | |
| | Panicum capillare | common witchgrass | Poaceae | 0 | sum | p/r/d | | grass |
| 266 | Panicum virgatum | switch grass | Poaceae | 4 | fall | p | c | grass |
| | Parthenium integrifolium | wild quinine | Asteraceae | 6 | spr | p | | forb |
| 205 | Parthenocissus quinquefolia | Virginia creeper | Vitaceae | 3 | sum | f/d | a | vine |
| | Paspalum laeve | field paspalum | Poaceae | 2 | sum | p/d | | grass |
| 97 | Penstemon digitalis | smooth beard-tongue | Scophulariaceae | 4 | sum | p | c | forb |
| 272 | Perilla frutescens | beefsteak plant | Lamiaceae | | fall | r | c | forb |
| 134 | Phleum pratense | timothy grass | Poaceae | | sum | p | o | grass |
| 15 | Phlox divaricata | blue phlox | Polemoniaceae | 4 | spr | f | c | forb |
| 167 | Phlox paniculata | perennial phlox | Polemoniaceae | 3 | sum | f/d | a | forb |
| 187 | Phryma leptostachya | lopseed | Verbenaceae | 2 | sum | f | o | forb |
| 139 | Phyla lanceolata | northern frog fruit | Verbenaceae | 3 | sum | p | o | forb |
| | [Lippia lanceolata Michx.] | | | | | | | |
| | Physostegia virginiana* | false dragonhead | Lamiaceae | 5 | sum | | | forb |
| 149 | Phytolacca americana | pokeweed | Phytolaccaceae | 2 | sum | d | c | shrub |
| 204 | Pilea pumila | clearweed | Urticaceae | 4 | sum | f/r | c | forb |
| | Pinus sp. | pine | Pinaceae | ? | | d | o | tree |
| 242 | Plantago lanceolata | English plantain | Plantaginaceae | | sum | r | o | forb |
| | Plantago rugelii | broad-leaved plantain | Plantaginaceae | 0 | sum | d | | forb |
| 40 | Platanus occidentalis | sycamore | Platanaceae | 3 | spr | f | c | tree |
| 70 | Poa chapmaniana | Chapman bluegrass | Poaceae | 2 | spr | r | o | grass |
| 50 | Poa pratensis | Kentucky bluegrass | Poaceae | | spr | d | a | grass |
| 53 | Poa sylvestris | woodland bluegrass | Poaceae | 5 | spr | d | c | grass |
| 60 | Podophyllum peltatum | May apple | Berberidaceae | 4 | spr | f | o | forb |
| | Polanisia dodecandra | clammy-weed | Capparaceae | 0 | sum | r | o | forb |
| 100 | Polygonatum biflorum | Solomon's seal | Liliaceae | 4 | sum | f | o | forb |
| | [P. canaliculatum s.l.] | | | | | | | |
| | Polygonum aviculare | knotweed | Polygonaceae | | sum-fall | d | c | forb |
| 102 | Polygonum cespitosum var. longisetum | knotweed | Polygonaceae | | sum | d | a | forb |
| | Polygonum erectum | erect knotweed | Polygonaceae | 1 | sum-fall | f/r | | forb |
| 217 | Polygonum lapathifolium | pale smartweed | Polygonaceae | 0 | sum | r | c | forb |
| 158 | Polygonum pensylvanicum | pinkweed | Polygonaceae | 1 | sum | p/d | o | forb |
| 246 | Polygonum punctatum | water smartweed | Polygonaceae | 3 | sum-fall | r/d | a | forb |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polygonum scandens | false buckwheat | Polygonaceae | 3 | sum-fall | f/r | | forb |
| | Polygonum virginianum | jumpseed | Polygonaceae | 1 | sum-fall | f | | forb |
| | [Persicaria virginiana] | | | | | | | |
| 206 | Populus deltoides | cottonwood | Salicaceae | 2 | sum | f/p | c | tree |
| | Portulaca oleracea | common purslane | Portulacaceae | | sum-fall | d | | forb |
| 125 | Potentilla norvegica | rough cinquefoil | Rosaceae | 0 | sum | p | o | forb |
| 123 | Potentilla recta | rough-fruited cinquefoil | Rosaceae | | sum | p | o | forb |
| 54 | Potentilla simplex | common cinquefoil | Rosaceae | 3 | spr | d | o | forb |
| 196 | Prunella vulgaris var. lanceolata | self-heal | Lamiaceae | 1 | sum | d | o | forb |
| | Prunus serotina | black cherry | Rosaceae | 2 | spr | f/d | o | tree |
| 117 | Ptelea trifoliata | common hop tree | Rutaceae | 5 | sum | f | o | tree |
| 215 | Pycnanthemum pilosum | hairy mountain mint | Lamiaceae | 5 | sum | p | o | forb |
| 216 | Pycnanthemum tenuifolium | slender mountain mint | Lamiaceae | 4 | sum | p | o | forb |
| | Quercus alba | white oak | Fagaceae | 4 | spr | f | o | tree |
| | Quercus imbricaria | shingle oak | Fagaceae | 3 | spr | f | o | tree |
| | Quercus palustris | pin oak | Fagaceae | 4 | spr | f | o | tree |
| | Quercus rubra | red oak | Fagaceae | 5 | spr | f | o | tree |
| | Quercus stellata | post oak | Fagaceae | 4 | spr | f | o | tree |
| | Quercus velutina | black oak | Fagaceae | 4 | spr | f | o | tree |
| 22 | Ranunculus arborvitus | small-flowered crowfoot | Ranunculaceae | 0 | spr | d | c | forb |
| 8 | Ranunculus ficaria | lesser celandine | Ranunculaceae | | spr | r | o | forb |
| 162 | Ratibia pinnata | prairie coneflower | Asteraceae | 5 | sum | p | c | forb |
| | Rhus aromatica | fragrant sumac | Anacardiaceae | 3 | spr | r/d | r | shrub |
| 21 | Ribes missouriense | Missouri gooseberry | Grossulariaceae | 3 | spr | f | o | shrub |
| 36 | Robinia pseudo-acacia | black locust | Fabaceae | 2 | spr | f | o | tree |
| | Rosa multiflora | multiflora rose | Rosaceae | | spr | d | o | shrub |
| 81 | Rubus flagellaris | dewberry | Rosaceae | 2 | spr | f/d | o | shrub |
| | Rubus pensilvanicus | highbush blackberry | Rosaceae | 2 | spr | f | | shrub |
| 118 | Rudbeckia hirta | black-eyed Susan | Asteraceae | 1 | sum | p | c | forb |
| 223 | Rudbeckia laciniata | cutleaf coneflower | Asteraceae | 3 | sum | f/d | o | forb |
| 250 | Rudbeckia subtomentosa | sweet coneflower | Asteraceae | 5 | sum | p | a | forb |
| 193 | Rudbeckia triloba | brown-eyed susan | Asteraceae | 4 | sum | d | c | forb |
| 130 | Ruellia strepens | wild petunia | Acanthaceae | 3 | sum | f | o | forb |
| 67 | Rumex altissimus | pale dock | Polygonaceae | 2 | spr | r | o | forb |
| 63 | Rumex crispus | curly dock | Polygonaceae | | spr | p | c | forb |
| 160 | Rumex obtusifolius | bitter dock | Polygonaceae | | sum | d | o | forb |
| | Salix caroliniana | Carolina willow | Salicaceae | 4 | spr | r | | tree |
| 107 | Salix exigua | sandbar willow | Salicaceae | 3 | sum | r/d | o | tree |
| | [S. interior] | | | | | | | |
| 234 | Salix nigra | black willow | Salicaceae | 2 | sum | r | o | tree |
| 146 | Sambucus canadensis | common elderberry | Caprifoliaceae | 2 | sum | f/d | c | shrub |
| 48 | Sanguinaria canadensis | bloodroot | Papaveraceae | 5 | spr | f | o | forb |
| | Sanicula canadensis | black snakeroot | Apiaceae | 3 | sum | f/d | | forb |
| 92 | Sanicula odorata | black snakeroot | Apiaceae | 2 | spr | r | o | forb |

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|---|---|---|---|---|---|---|---|---|
| | [Sanicula gregaria] | | | | | | | |
| 35 | Sassafras albidum | sassafras | Lauraceae | 2 | spr | f | r | tree |
| | Schizachyrium scoparium | little bluestem | Poaceae | 5 | fall | p | | grass |
| | [Andropogon scoparius] | | | | | | | |
| | Scrophularia marilandica | late figwort | Scrophulariaceae | 3 | sum | f | | forb |
| 154 | Securigera varia | crown vetch | Fabaceae | | sum | d | o | shrub |
| | [Coronilla varia] | | | | | | | |
| 171 | Senna marilandica | wild senna | Fabaceae | 4 | sum | p | o | forb |
| | [Cassia marilandica] | | | | | | | |
| | Setaria faberi | nodding foxtail grass | Poaceae | | sum | d | | grass |
| 226 | Setaria pumila | yellow foxtail grass | Poaceae | | sum | d | c | grass |
| | [S. glauca] | | | | | | | |
| 252 | Setaria viridis var. viridis | green foxtail | Poaceae | | sum | d | a | grass |
| | Sicyos angulatus | bur cucumber | Cucurbitaceae | 4 | sum | f | | vine |
| | Sida spinosa | prickly sida | Malvaceae | | sum | d | | forb |
| | Silene regia | royal catchfly | Caryophyllaceae | 10 | sum | p | | forb |
| 173 | Silphium integrifolium | rosinweed | Asteraceae | 4 | sum | p | o | forb |
| | Silphium laciniatum | compass plant | Asteraceae | 6 | sum | p | o | forb |
| 199 | Silphium perfoliatum | cup plant | Asteraceae | 3 | sum | p | o | forb |
| | Silphium terebinthinaceum | prairie dock | Asteraceae | 5 | sum | p | | forb |
| 82 | Sisyrinchium angustifolium | blue-eyed grass | Iridaceae | 5 | spr | p/d | c | forb |
| | [S. bermudiana] | | | | | | | |
| 188 | Smilax hispida | bristly greenbrier | Smilacaceae | 3 | sum | f | c | vine |
| | [S. tamnoides var. hispida | | | | | | | |
| 106 | Solanum carolinense | horse nettle | Solanaceae | 0 | sum | p | o | forb |
| 189 | Solanum ptycanthum | black nightshade | Solanaceae | 1 | sum | r | r | forb |
| | [S. americanum] | | | | | | | |
| 265 | Solidago altissima | tall goldenrod | Asteraceae | 1 | fall | p/r | c | forb |
| 233 | Solidago gigantea | late goldenrod | Asteraceae | 4 | sum | r | o | forb |
| | Solidago missouriensis | Missouri goldenrod | Asteraceae | 4 | sum | p | | forb |
| | Solidago rigida* | stiff goldenrod | Asteraceae | 6 | fall | | | forb |
| | Solidago speciosa | prairie goldenrod | Asteraceae | 7 | fall | p | | forb |
| 142 | Sonchus asper | prickly sow thistle | Asteraceae | | sum | r/p | o | forb |
| 208 | Sorghastrum nutans | Indian grass | Poaceae | 5 | sum | p | c | grass |
| 276 | Sorghum bicolor ssp. bicolor | sorghum | Poaceae | | fall | r | r | grass |
| | Sporobolus heterolepsis | prairie dropseed | Poaceae | 6 | fall | p | | grass |
| 87 | Stellaria graminea | common stitchwort | Caryophyllaceae | | spr | d | c | forb |
| 3 | Stellaria media | common chickweed | Caryophyllaceae | | spr | d | a | forb |
| | Strophostyles umbellata | wild pink bean | Fabaceae | 3 | sum | f | | forb |
| | Stylophorum diphyllum | celandine poppy | Papaveraceae | | spr | f | | forb |
| | Taraxacum officinale | common dandelion | Asteraceae | | spr-fall | d | a | forb |
| | Taxodium distichum | bald cypress | Taxodiaceae | 8 | | d | r | tree |
| 176 | Teucrium canadense | wood sage | Lamiaceae | 2 | sum | p | o | forb |
| 10 | Thlaspi arvense | field penny cress | Brassicaceae | | spr | d | a | forb |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 247 | Tilia americana var. americana | American basswood | Tiliaceae | 5 | sum | r | o | tree |
| | Torilis arvensis | hedge parsley | Apiaceae | | sum | d | | forb |
| | [Torilis japonica] | | | | | | | |
| 151 | Toxicodendron radicans | poison ivy | Anacardiaceae | 1 | sum | f | c | vine |
| | [Rhus radicans] | | | | | | | |
| 83 | Tradescantia virginiana | spiderwort | Commelinaceae | 6 | spr | d | o | forb |
| 267 | Tridens flavus | purpletop | Poaceae | 1 | fall | p | o | grass |
| 120 | Trifolium campestre | large hop clover | Fabaceae | | sum | d | o | forb |
| 78 | Trifolium dubium | little hop clover | Fabaceae | | spr | d | c | forb |
| 95 | Trifolium pratense var. pratense | red clover | Fabaceae | | sum | d | o | forb |
| 79 | Trifolium pratense var. sativum | red clover | Fabaceae | | spr | d | o | forb |
| 80 | Trifolium repens var. repens | white clover | Fabaceae | | spr | d | a | forb |
| 57 | Trillium recurvatum | purple trillium | Liliaceae | 6 | spr | f | o | forb |
| 114 | Triodanis perfoliata | Venus' looking glass | Campanulaceae | 2 | sum | p/d | c | forb |
| | [Specularia perfoliate] | | | | | | | |
| 145 | Tripsacum dactyloides | eastern gama grass | Poaceae | 5 | sum | p | c | grass |
| | Ulmus americana | American elm | Ulmaceae | 4 | spr | f | c | tree |
| | Ulmus rubra | slippery elm | Ulmaceae | 3 | spr | f | o | tree |
| 55 | Valerianella radiata | beaked corn salad | Valerianaceae | 0 | spr | d | o | forb |
| 254 | Verbascum blattaria | moth mullein | Scrophulariaceae | | fall | p | o | forb |
| | Verbascum thapsus | mullein | Scrophulariaceae | | sum | p/d | o | forb |
| 185 | Verbena urticifolia | nettle-leaved vervain | Verbenaceae | 4 | sum | p | o | forb |
| | Verbena hastata | blue vervain | Verbenaceae | 4 | sum | f/p | | forb |
| 202 | Verbesina alternifolia | yellow ironweed | Asteraceae | 4 | sum | p/d | o | forb |
| 175 | Vernonia baldwinii | ironweed | Asteraceae | 2 | sum | p/d | o | forb |
| | Vernonia missurica | ironweed | Asteraceae | 4 | sum | p | | forb |
| 69 | Veronica peregrina | purslane speedwell | Scrophulariaceae | 0 | spr | r | o | forb |
| 4 | Veronica polita | wayside speedwell | Scrophulariaceae | | spr | d | a | forb |
| 220 | Veronicastrum virginicum | culver's root | Scrophulariaceae | 7 | sum | p | o | forb |
| 62 | Vicia sativa ssp. nigra | common vetch | Fabaceae | | spr | p/d | a | forb |
| | [var. segetalis] | | | | | | | |
| 85 | Vicia villosa ssp. varia | hairy vetch | Fabaceae | | spr | p/d | a | forb |
| | [V. dasycarpa] | | | | | | | |
| 14 | Viola rafinesquii | Johnny-jump-up | Violaceae | | spr | d | c | forb |
| 1 | Viola sororia | common violet | Violaceae | 2 | spr | d | a | forb |
| 28 | Viola striata | pale violet | Violaceae | 3 | spr | f | o | forb |
| | Vitis cinerea | winter grape | Vitaceae | 4 | | | | vine |
| 108 | Vitis riparia | riverbank grape | Vitaceae | 4 | sum | r | c | vine |
| 241 | Xanthium strumarium | common cocklebur | Asteraceae | | sum | r | o | forb |
| 116 | Zizia aurea | golden Alexanders | Apiaceae | 5 | sum | f/d | o | forb |

**Appendix 2a: Insect groups observed or collected at LREC, 1992**

| Insect Order | Common Name | Habitat |
|---|---|---|
| Colembola | Springtails | stream |
| Coleoptera | Blister beetle | prairie |
| | Darkling beetle | forest |
| | Crawling water beetle | stream |
| | Ground beetle | forest |
| | Lady beetle | forest, prairie |
| | Milkweed beetle | prairie |
| | Predaceous diving beetle | stream |
| | Snout beetle (weevils) | forest, prairie |
| | Soldier beetle | prairie |
| | Tiger beetle | stream |
| | Tumbling flower beetle | prairie |
| | Twelve-spotted cucumber beetle | forest, prairie |
| Diptera | Bee flies | prairie |
| | Crane flies | forest |
| | Flower flies | prairie |
| | Mosquitos | stream |
| Hemiptera | Assassin Bugs | forest |
| | Backswimmers | stream |
| | Leaf bugs | forest |
| | Leaf-footed bugs | prairie |
| | Shore bugs | stream |
| | Small milkweed bugs | prairie |
| | Stink bugs | prairie |
| | Toad bugs | stream |
| | Water striders | stream |
| Homoptera | Aphids | prairie |
| | Plant hoppers | forest |
| | Cicadas | forest |
| | Buffalo treehoppers | forest |

**Appendix 2a (continued)**

| Insect Order | Common Name | Habitat |
|---|---|---|
| Hyinenoptera | Ants | forest, prairie |
| | Bald—faced hornets | forest, prairie |
| | Bumble bees | prairie |
| | Carpenter bees | prairie |
| | Honey bees | prairie |
| | Icneumon wasps | prairie |
| | Paper wasps | forest |
| | Potter wasps | prairie |
| | Spider wasps | prairie |
| | Yellow jackets | prairie |
| Isoptera | Termites | forest |
| Lepidoptera | Butterflies | forest, prairie |
| (see appendix 2b) | Moths | forest, prairie |
| Neuroptera | Green lacewings | forest |
| Odonata | Big green darner | prairie |
| | Damselfly nymphs | stream |
| | Lubellulid dragonfly | prairie |
| Orthoptera | Grasshoppers | forest, prairie |
| | Crickets | forest, prairie |

**Appendix 2b: Butterflies collected at LREC, 1992**

| Specific name | Common name |
|---|---|
| *Epargyreus clarus clarus* | Silver spotted skipper |
| *Atelopedes campestris huron* | Sachem skipper |
| *Pholisora catullus* | Common sooty wing skipper |
| *Ancyloxypoha numitor* | Least skipper |
| *Pterousus glaucus glaucus* | Tiger swallowtail |
| *Pterousus troilus troilus* | Spicebush swallowtail |
| *Artogeia rapae* | European cabbage |
| *Colias philodice philodice* | Clouded sulphur |
| *Colias eurytheme* | Alfalfa butterfly |
| *Abaeis nicippe* | Sleepy orange |
| *Celastrina argiolus ladon* | Spring azure |
| *Speyeria cybele cybele* | Great spangled fritilary |
| *Phyciodes tharos tharos* | Pearl crescent |
| *Polygonia comma* | Comma or Hop Merchant |
| *Vanessa cardui* | Painted lady |
| *Basilarchia arthemi astyanax* | Red spotted purple |
| *Danaus plexippus* | Monarch or Milkweed |

## Appendix 3: Reptiles and Amphibians of the Litzsinger Road Ecology Center, 1992

| Scientific Name | Common Name | Location |
|---|---|---|
| **Class Amphibia** | Amphibians | |
| Salamanders: Order Caudata | | |
| *Ambystoma maculatum** | Spotted salamander | f |
| *Ambystoma tigrinum tigrinum** | Eastern tiger salamander | f/p |
| Frogs and Toads: Order Anura | | |
| *Bufo americanus* | Eastern American toad | f |
| *Acris crepitans blanchardi* | Blanchard's cricket frog | st |
| *Hyla crucifer crucifer** | Northern spring peeper | f/st |
| *Hyla chrysoscelis** | Gray treefrog | f |
| *Hyla versicolor** | Gray treefrog | f |
| *Psuedacris triseriata** | Western chorus frog | f/p |
| *Rana catesbiana** | Bullfrog | st |
| *Rana sphenocephala** | Southern leopard frog* | f/st |
| **Class Reptilia** | Reptiles | |
| Turtles: Order Testudinata | | |
| *Chrysemys picta bellii** | Western painted turtle | st |
| *Trachemys scripta elegans** | Red-eared slider | st |
| *Terrapene carolina triunguis* | Three-toed box turtle | f/p |
| *Terrapene ornata ornata** | Ornate box turtle | p |
| Lizards: Order Squamata (Suborder Sauna) | | |
| *Sceloporus undulatus hyacinthinus** | Northern fence lizard | f |
| *Eumeces anthracinus pluvialis** | Southern coal skink | f |
| *Eumeces fasciatus** | Five-lined skink | f |
| *Eumeces laticeps** | Broadhead skink | f |
| *Chemidophorus sexlineatus** | Six-lined racerunner | p |
| *Ophisaurus attenuatus attenuatus** | Western slender glass | f/p |
| Snakes: Order Squmata (Suborder Serpentes) | | |
| *Coluber constrictor flaviventris** | Eastern yellowbelly | f |
| *Diadophis punctatus arnyi** | Prairie ringneck snake | f/p |
| *Elaphe obsoleta obsoleta* | Black rat snake | f/p |
| *Lampropeltis calligaster calligaster** | Prairie kingsnake | f/p |
| *Opheodrys aestivus** | Rough green snake | st |
| *Heterodon platyrhinos** | Eastern hognose snake | f |
| *Nerodia sipedon sipedon* | Northern water snake | st |
| *Storeria dekayi wrightorum* | Midland brown snake | st |

## Appendix 3: (continued)

| Scientific Name | Common name | Location |
|---|---|---|
| Storeria *occipitomaculata occipitomaculata** | Northern redbelly snake | f |
| *Thamnophis proximus proximus** | Western ribbon snake | st |
| *Thamnophis sirtilis sirtilis* | Eastern garter snake | st |
| *Virginia striatula** | Rough earth snake | f |
| *Agkistrodon contortrix phaeogaster** | Osage copperhead | f/st |

An asterick (*) denotes a species that, based on habitat, may occur but was not observed.

Key to abbreviations
f = forest
s = stream or stream bank
p = prairie

**Appendix 4: Birds of the Litzsinger Road Ecology Center, 1992**

| Order | Common Name |
|---|---|
| Ciconiiformes | Great Blue Heron |
| | Green—backed heron |
| Anseriformes | Canada Goose |
| | Wood Duck |
| | Mallard |
| Falconiformes | Turkey Vulture |
| | Bald Eagle |
| | Northern Harrier |
| | Sharp-shinned Hawk |
| | Cooper’s Hawk |
| | Red-shouldered Hawk |
| | Broad-winged hawk |
| | Red-tailed Hawk |
| | American Kestral |
| | Merlin |
| Strigiforines | Barred Owl |
| Galliformes | Wild Turkey |
| Columbiformes | Rock Dove |
| | Mourning Dove |
| Charadriiformes | Common Snipe |
| Cuculiformes | Yellow-billed Cuckoo |
| Apodoformes | Chimney Swift |
| | Ruby-throated Hummingbird |
| Caprimulgiformes | Common Nighthawk |
| Coraciiformes | Belted Kingfisher |
| Piciformes | Red-headed Woodpecker |
| | Red-bellied Woodpecker |
| | Yellow-bellied Sapsucker |
| | Downy Woodpecker |
| | Hairy Woodpecker |
| | Northern Flicker |
| | Pileated Woodpecker |

**Appendix 4 (continued)**

| | |
|---|---|
| Passiformes | |
| F. Tyrannidae | Eastern Wood-Pewee |
| | Yellow-bellied Flycather |
| | Least Flycather |
| | Eastern Phoebe |
| | Great Crested Flycather |
| Hirundinidae | Tree Swallow |
| | Barn Swallow |
| Corvidae | Blue Jay |
| | American Crow |
| Paridae | Caroline Chickadee |
| | Tufted Titmouse |
| Sittidae | White-breasted Nuthatch |
| Certhiidae | Brown Creeper |
| Troglodytidae | Carolina Wren |
| | House Wren |
| | Sedge Wren |
| | Winter Wren |
| Muscicapidae | Golden-crowned Kinglet |
| | Ruby-crowned Kinglet |
| | Blue-grey Gnatcatcher |
| | Eastern Bluebird |
| | Swainson’s Thrush |
| | Hermit Thrush |
| | American Robin |
| Mimidae | Gray Catbird |
| | Northern Mockingbird |
| | Brown Thrasher |
| Bombycillidae | Cedar Waxwing |
| Sturnidae | European Starling |
| Vireonidae | Red-eyed Vireo |
| | Warbling Vireo |
| Emberizidae | Tennessee Warbler |
| | Orange-crowned Warbler |
| | Nashville Warbler |
| | Chestnut-sided Warbler |
| | Magnolia Warbler |
| | Yellow-rumped Warbler |
| | Black-throated Gr. Warbler |
| | Blackburian Warbler |
| | Palm Warbler |
| | Black-and-white Warbler |
| | American Redstart |
| | Northern Waterthrush |
| | Louisiana Waterthrush |

**Appendix 4 (continued)**

| | | |
|---|---|---|
| Passiformes | | |
| | F. Emberizidae | Kentucky Warbler |
| | | Common Yellowthroat |
| | | Northern Cardinal |
| | | Rose-breasted Grosbeak |
| | | Indigo Bunting |
| | | Rufous-sided Towhee |
| | | Chipping Sparrow |
| | | Field Sparrow |
| | | Savannah Sparrow |
| | | LeConte’s Sparrow |
| | | Fox Sparrow |
| | | Song Sparrow |
| | | Lincoln’s Sparrow |
| | | Swamp Sparrow |
| | | White-throated Sparrow |
| | | White-crowned Sparrow |
| | | Dark-eyed Junco |
| | | Red-winged Blackbird |
| | | Eastern Meadowlark |
| | | Rusty Blackbird |
| | | Common Grackle |
| | | Brown-headed Cowbird |
| | | Northern Oriole |
| | Fringillidae | Purple Finch |
| | | House Finch |
| | | Pine Siskiri |
| | | American Goldfinch |
| | Passeridae | House Sparrow |
| | | Eurasian Tree Sparrow |

**Appendix 5: Mammals Observed or Expected at LREC, 1992**

| Specific Name | Common Name |
|---|---|
| *Diclelphis virginiana* | Opossum |
| *Scalopus aquaticus* | Eastern mole |
| *Condylura cristata** | Star-nosed mole |
| *Microtus orchrogaster** | Prairie vole |
| *Lasiurus borealis** | Red bat |
| *Tamias striatus** | Eastern chipmunk |
| *Sciurus carolinensis* | Eastern grey squirrel |
| *Sciurus niger** | Eastern fox squirrel |
| *Glaucomys volans** | Southern flying squirrel |
| *Peromyscus maniculatus* | Deer mouse |
| *Peromyscus leucopus** | White-footed mouse |
| *Reithrodontomys megalotus** | Harvest mouse |
| *Mus musculus** | House mouse |
| *Procyon iotor* | Raccoon |
| *Vulpes vulpes** | Red fox |
| *Odocoiles virginianus* | White-tailed deer |
| *Canis latrons** | Coyote |
| *Mephitis mephitis** | Striped skunk |

An asterick (*) denotes a species that, based on habitat, may occur but was not observed.

**Appendix 6: Equipment needed at LREC**

In no particular order this is a list of equipment which may be useful for student activities at LREC

Plant press with sheets
Survey tape
Taxonomic keys for plants and animals
Sample bottles and preservatives for insects.
Binoculars
Butterfly nets
Aquatic nets
Trays for collecting and observing stream biota.
Live mammal traps
Field notebooks
Maps of the property
Dissecting microscopes
Slide projector and screen
Slide boxes
Video camera and VCR
Forceps, pipettes and other tools for manipulating organisms
Trowels
Machetes
Compasses
Portable pH meters
Balances
Thermometers
First aid kit