Geologic Setting of the L.C.A.
Lutheran Outdoor Ministries Center
Oregon, Illinois

Perhaps it is appropriate that the Lutheran Outdoor Ministries Center should have as its most prominent topographic feature the "Devil's Backbone" & as its most significant geologic feature numberous outcrops of the rock layer known as the St. Peter Sandstone. Thus, geographic coincidence serves as a remainder of the intimate association of good and evil. These features constitute the west bluff of the Rock River at this point. Although the property does not directly adjoin the Rock River, the latter has played an important role in determining the character of the landscape of the Lutheran Outdoor Ministries Center.

Bedrock

The St. Peter Sandstone is the exposed bedrock over most of the Lutheran Outdoor Ministries Center. It takes its name from the former St. Peter River, now known as the Minnesota River, along whose bluffs it is well exposed at Minneapolis, Minnesota. It is present throughout the north-central United States, but in most places it is covered by younger strata and is not observed at the earth's surface. At Oregon, Illinois, however, an upwarp of the strata (known as an anticline) has occurred, bringing the St. Peter to the surface. A similar upwarp brings the St. Peter Sandstone to the surface at Starved Rock State Park near Utica, Illinois, where it forms Starved Rock itself. The rock consists of beautifully rounded, glistening grains of quartz and is interpreted as having formed the beach of an ancient sea which covered most of North America some 450 million years ago (middle Ordovician Period). The rock is poorly cemented and can easily be broken when rubbed between the fingers. It contains much void space between the grains which permits water to move readily through the rock long distances underground under pressure even where buried by hundreds of feet of overlying rock strata. This water can be tapped by wells and is used by many cities and towns as a water supply; in some places it is even naturally fluoridated. The rock is such a pure concentration of quartz that it can be used for making glass, as at Ottawa, Illinois. Ground silica, an ingredient in paint, pottery, and china, scouring powders, molds for metal castings, and enamel, is produced at the quarry immediately northwest of the Outdoor Ministries Center.

Along the western crest of the Devil's Backbone the St. Peter Sandstone is overlain by a few feet of shale, a form of clay, and this in turn is covered by up to twenty feet of limestone. The latter is called the Platteville Limestone, named after Platteville, Wisconsin. A product of deposition in an ancient sea, it is limited in extent and poorly exposed at the Outdoor Ministries Center, but it can be seen in several quarries two to four miles east of Oregon and at the large quarry on the north limits of Dixon, Illinois, ten miles downstream.

Topography

The bluffs of the Rock River including the Devil's Backbone constitute the bulk of the wooded areas of the Outdoor Ministries Center and are typical of the more rugged portions of the bluffs between Dixon and Rockford. The prominence of the Devil's Backbone is due to the presence of a small remnant of resistant Platteville Limestone which erosion has not yet removed from the crest of the ridge. The

bluffs themselves, of course, are also the result of erosion by the Rock River and its tributary ravines. In places this erosion has left small hills and knobs of sandstone lying detached and somewhat isolated along the foot of the main bluff. This is particularly apparent southwest of Gale Creek in the vicinity of the Dining Hall.

The present course of the Rock River is the result of the rearrangement of pre-existing streams by the Ice Age continental glacier about 20,000 years ago. The accompanying map shows how the earlier streams were blocked by glacial ice coming from the northeast and how a new stream, the present Rock River, took its course along the edge of the glacier. Spillways, now marked by narrow, rugged portions of the valley, formed where this stream was forced to cross pre-existing drainage divides. The Outdoor Ministries Center lies at one of these spillways.

Glaciers lay within the drainage basin of the Rock River from about 20,000 years ago until about 12,000 years ago. During this time the river carried huge quantities of sediment-laden meltwater from the glaciers, resulting in the deposition of sand and gravel on the floor of the valley to a thickness of as much as fifty feet. During the past 12,000 years, since the withdrawal of the glaciers, the river has worked at removing this sediment load and has cut down into it to the extent that the former valley floor now stands in the form of terraces whose surfaces are several tens of feet above present river level. The flat surface east of Highway 2 across from the Outdoor Ministries Center and along Gale Creek northeast of the Dining Hall are examples of such terraces.

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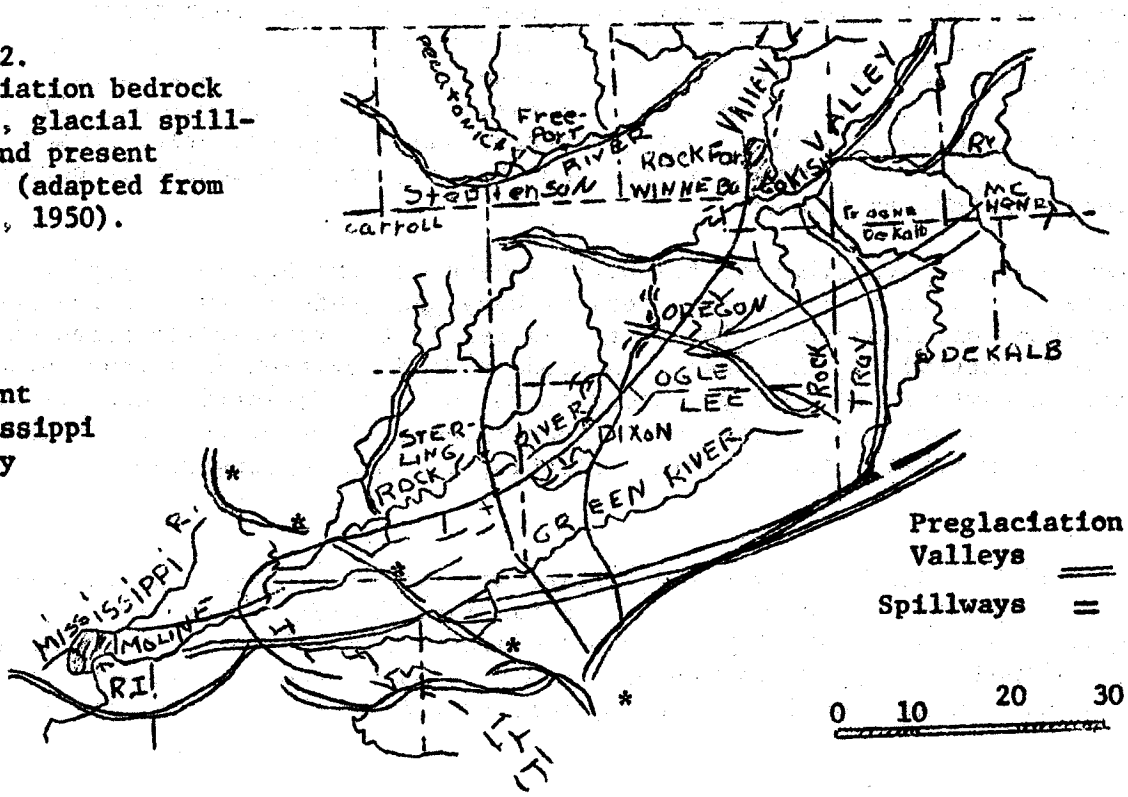

Figure 2. Preglaciation bedrock valleys, glacial spillways, and present streams (adapted from Horberg, 1950).

* Ancient Mississippi Valley

Edge of Glacier about 20,000 Years Ago

Direction of Glacier Movement

ENVIRONMENTAL RECONNAISSANCE

1972

INTRODUCTION

"The immediate uncertainty of religion now and then is exchanged for the long-term uncertainty of science."

"The boulder on which I stand, the pebble that I release or hold - it is they, really, that hold me. . ."

The ecology of life in the forest/prairie interface is transparent. Each slope, each level of elevation has its own characteristic population. Life is not haphazard here. It chooses very carefully.

This report contains a resource inventory and analysis, considering major physiographic factors affecting the site. In addition, environmental impact considerations are identified and recommendations are made concerning the present condition and possible future use of the site for L.C.A. camping needs as described to me by Mr. Ed Livingston, and Mr. Norman Mandehr. The purchase proposal may then be seen in the light of this research.

The study approach was *qualitative* rather than *quantitative*, due to the preliminary nature of the proposal. Primary consideration was given to site analysis of *vegetation* in *relation* to wildlife, climatic influences, geology (bedrock and surficial) and hydrology. Information providing background data was gathered from studies of the Rock River basin, Illinois Geological Survey maps, the Lorado-Taft Field Campus of Northern Illinois University, the Ogle County branch of the Soil Conservation Service & Agricultural Stabilization and Conservation Service, the Oregon Illinois Public Library, and the County Clerk's office in Oregon, Illinois.

I walked most of the site (with the joyful company of the Martin's St. Bernard puppy) as well as digesting documents from the above sources. Valuable assistance was especially given by Thelma Carpenter, Oregon, Illinois librarian and resident naturalist.

II. RESOURCE INVENTORY AND ANALYSIS

Topography

The site is located in Oregon Township, and is south of Oregon, Illinois, abutting and to the west of state route #2. Ridges

II. RESOURCE INVENTORY AND ANALYSIS (Con'd.)

encasing the Rock River Valley offer a rugged setting and contrast to the lush forest and rolling prairie landscapes above and to either side of the river. To the east is farmland, broken only by occasional woods. To the west the upland plateau slants gently towards the Mississippi River.

Much of the site can be dated to the Ordovician epoch, during which recurring sedimentations produced the sandstones and limestones which are the "basement" for this holy ground. Glaciation, and subsequent settling, sedimentation and more erosion have completed the sculpting of the Rock River Valley.

Outstanding on the site is the "Devil's Backbone" formation, whose genesis I can only now guess at, as the histories of it were not available to me.

Geology

My suspicions are that some time in the geological past, the river bottom valley area was level with the surrounding plateau. The life of this river and its valley and hills is mirrored in those formations which can be traced back. Bedrock near the surface includes sandstones and limestones (St. Peter and Platville, respectively), both dating from Ordovician innundations and sedimentations. There is also some presence of Galena and Prairie du Chien formations. Sandstone outcroppings provide needed silica (witness the large sand plant abutting the west property line), as well as serving as excellent aquifers (note frequent springs).

Pennsylvanian sedimentation and drift was next to affect the site, followed much later by Pleistocene glaciation and melting cycles, leaving overlapping layers of drift and loess, of loess and drift. Both Illinoisan and Wisconsin glaciers reached these areas.

Soils

The variety of processes above, plus adequate moisture, provided the setting for rapid soil development, culminating in encompassing podsolization, although the effects of this layering and leeching are at times mitigated by the presence, near the surface, of bedrock limestones. Blue clays appear at varying depths, and a sandy loam is frequently encountered in the uplands, which has encouraged the development of sporadic pine groves.

Generally the upland soils are well drained, and the flood plain and bottomlands not so. All associated soils carry a high degree of organic matter, altered only by poor farming practices.

Climate

The site is characterized by moderate winds, a mean annual temperature of 49.3° F., and about 34" of moisture per year. The al-

Climate (Con'd.)

titude is between 7 & 900 feet. Frost-free days number about 163 usually. The vapor deficit and precipitation-evaporation ratio are both moderate, indicating a "balanced" amount of moisture being retained in the air, yet not overly humid nor excessively xeric.

Vegetation and Ecology

The site is located along the midwest transition zone between eastern deciduous forest and the long-grass (mesic) prairie to the west. In such areas, the type of vegetation which develops is dependent to a large extent on local variations in topography, with resultant minor but significant changes in the microclimate and surficial geology.

It is these variations which are important in determining the nature of the vegetation in the site. Along the southern edge of the property arises the "Devil's Backbone" formation, already mentioned above. This climaxes on the southeastern corner with a series of ravine-and-ridge formations leading east down to highway #2. This area, extending north to the farm access road, will be called the "ridge and ravine" area. Also included under this title are the numberous ridges and ravines bordering the "upland plateau" to the north and east. The "upland plateau", as well as the "bottomlands" are evident,and are presently monocropped in field corn. The plateau includes all the flat area on high ground, fields interspersed with thick wind breaks. The "bottomlands" include the flat areas to the north and east of the farm buildings, and through which the Gale Creek runs. Finally, the northwest quarter of the site is over-grazed and over-pastured hills and valleys. This area is in constant use by snowmobile traffic. It is labeled the "gulch".

In 1854, a topographic survey was made of the Oregon Township area. A fairly accurate map was drawn indicating not only the general topography of the area but also delimiting the prairie and forest areas of the region. In addition, comments were made by the surveyor along each section line classifying the forested regions according to dominant tree types. The area called "bottomlands" was at that time also drained by Gale Creek and was primarily long-grass prairie, as no witness-trees were noted. In the hills surrounding this lush prairie area were found black and white oaks and hickory, presumably either shagbark or butternut. White oaks were found on the hills in the presently labeled "gulch"area, where no such species is now present to any great extent, except in isolated patches. These hills may have since been repeatedly burned to keep them free

Vegetation and Ecology (Con'd.)

of woody vegetation until recently. For sure they have been abused by over-grazing quite recently.

On the upland terraces and woods in the central, southern, southwestern corners, the vegetation was dominated by oaks, with some hickories present. Black oak was noted in the survey as being extremely prevelant. Black oak, however, is easily mistaken, even by botanists, for red oak, as they are very similar in general appearance. Both are now present as dominant members of the present vegetation.

The character of the original marsh or wet prairie (bottomlands) has changed due to the impact of civilization. The fields of prairie grasses have been replaced by fields of corn. In addition, a substantial portion of the wooded areas are heavily pastured.

In general, the wooded areas are classified into two plant associations, both of which are part of the eastern deciduous forest. These are based on topography -- the ravine and bluff (ridge) areas which are made up of a maple-basswood association, and the level uplands which typify an oak-hickory association.

The many ravines which fan out through the southeastern portion of the site and the northcentral areas support a rather uniform vegetation. Within the ravines themselves, sugar maple and basswood saplings are arriving at maturity, while often the present dominants are large and old elms. Green ash is also present, as is box elder as a pioneer species. It is probably the more favorable soil moisture conditions encountered in ravines which favor the growth of these species. Ironwood and mockernut, locusts and various oaks may also be present.

Shrubs in these areas include blackberry, raspberry, firethorn, several species of greenbriar (smilax), hazelnut, Canada moonseed, wild currants and gooseberries, black cherry, and along the ridgetops, witch-hazel. Also included are bittersweet, Virginia creeper and poison ivy, as well as grapes, elder and honeysuckle.

Seedlings are quite often sugar maple and basswood, indicating a transition phase from elm to the more stable (and complex) forest. It is unclear to me at this time whether the young maple-basswood associations developing in the ravines will be maintained or will eventually alter to more xeric species, such as are present on the surrounding uplands.

The herbaceous ground cover is usually dominated by jewelweed, nettle, sweet cicely, and various ferns and lycopodia.

Vegetation and Ecology (Con'd.)

At the upper edges of these slopes are found red cedar, a common cliff-hanger as well as occasional black walnut (on the south slope crest) and hop trees.

The vegetation on the uplands is divided into cropped areas, (which have been cleared of the once thick forests) and their attendant remnants in the form of natural shelter belts and wind breaks, as well as the ridge tops and wide bluffs. The crop again is corn, supported with heavy artificial fertilizers and hybrid seeds. In general, the wooded uplands can be still classified under oak-hickory woods as they were in 1854. However, the average diameter of today's trees is only 6" - 8" as compared to the 14" - 18" of the former. This indicates a period of logging, fire, or grazing which did not allow seedlings to grow for a number of years. Northern red oak, black oak, pin oak and the shagbard and bitternut hickories are the most dominant species, the latter being on prairie (or former prairie) borders. Hackberry, American elm, box elder, black cherry, trembling aspen and bigtooth aspen are also common.

The ravine and ridge areas provide food and shelter for a variety of wildlife. In addition, these forest associations have protected the watershed by absorbing rainfall and runoff and have prevented erosion and serious siltation of drainage systems. The primary aesthetic attractiveness of the site, for most people, centers on these wooded and rough ravines and bluffs.

Shrubs common on the upland areas include hazelnut, bracken, currants and gooseberries, brambles, witch hazel, dogwoods, juneberries, roses, lespedeza, choke-cherries (over limestone outcroppings), blueberries, huckleberries, hawthorns, firecherry, sumacs, and highbush cranberry (on north facing slopes).

The upland herbaceous layer and ground cover varies considerably upon soil moisture conditions and amount of shade cast by the overstory, as well as by the season. Sweet cicely, tick trefoil, Solomon's seal, ferns, cohosh, and others are present.

The "gulch" area and surrounding hills tell a story of land misuse. Vegetation here consists of Pennsylvania sedge (an indicator of intense compaction), Kentucky bluegrass, some bromegrass, many honey locusts, hawthorns and some oak seedlings and saplings, as well as scattered annuals and biennials such as mullein, milk weed, figwort, and prickly ash.

The effect of heavy pasturage is the almost complete replacement of the normal herbaceous ground cover, consisting here of a savannah-like mixture of grasses and trees, with Kentucky bluegrass and Carex pennsylvanicus (Pennsylvania sedge). The effect on trees and shrubs is not less dramatic. Those woody plants which can survive

Vegetation and Ecology (Con'd.)

the grazing become common, such as the thorned locusts and hawthorns, as well as prickly ash. Other seedlings are either crushed, frozen or eaten. It is thus evident that under continued heavy grazing, the life of a woods is limited to the maximum age which can be attained by the existing trees. A fine example of unimpeded old field succession can be found across a low fence facing west along the northwestern corner of the property. Also, it is in this area and along the adjacent railroad tracks that prairie grasses have survived, offering a viable seed source for any natural re-introduction to the site.

Snowmobiling has decimated much area not pastured, due primarily, to unrestricted usage. At the time of my stay at the site (December 27-29, 1972) there was 3" - 4" of corn snow on the ground. At least one snowmobile was running all day, and after dark on both nights a large group of between five and eight machines could be seen roaring over the "gulch" area. Recent research suggests that serious compaction takes place of the insulating snow cover when such a machine tread crushes it. Such compaction literally collapses the insulation to the ground, and coats emergent plant life with ice, killing much of it.

Microclimates on the site are rather distinct, especially in forested areas. Cool air flow will follow topography, and so more northern, moisture loving species will (and are!) around in ravines, while the plateau forests are drier. However, the most noticeable microclimatic effect may be felt in a comparison (on a sunny winter day) between the south facing slope of the "Devil's Backbone" and any north facing slope of one of the many ravines. Temperature differences are amazing to a height of two meters above the ground. Vegetation on this south slope is generally more dense than anywhere else on the site, including the inner ravine slopes.

Since it was impossible to obtain information of the past history of the site, little more can be said concerning its present ecology.

Wildlife

The faunal life zone(s) present on the site coincide with the variety of vegetational zones described in the previous discussion. The type of fauna of the eastern deciduous and long-grass prairie ground include white-tailed deer; red and grey fox; red, grey and fox squirrels; cottontail, evening grosbeak many warblers; Richardson ground squirrel, etc.

Current indications suggest that wildlife populations do not appear to be large. I did see tracks of squirrel, cottontail, deer mice, shrew, white-tailed deer, red fox, raccoon, mink and flying squirrel. The presence and activities of man on the site are a principal limiting factor in determining wildlife abundance. In particular, snow-

Wildlife (Con'd.)

mobiles and poor land use and spraying practices limit reproduction and cover. However, small mammal activity appears moderate.

In the future, the quality of the presence of man will determine the relative abundance of fauna, especially the hooved ungulates whose privacy needs are quite high. The vegetation on-site generally has a high nutritive capacity, and brousing evidences suggest some rodent population.

III. RECOMMENDATIONS

Water Quality and Drainage

1) Gale Creek is being developed by the town of Oregon as a storm sewer for several western edge subdivisions. Terrace View subdivision, for example, has 4 D.U./Acre with septic systems. With the accompanying paving, streets and drains, the normally absorbed ground water will become surface runoff, and will be (as the direction is now moving) channeled into a widened creek bed. Such work was going on *on site* immediately prior to the time I was at the site. Many trees were ripped out and a bulldozer stood by. Mr. Martin, the tenant, was unavailable during the time I was there. Wildlife habitat is and will be destroyed, along with vegetation. The attraction of the stream is much diminished.

2) Flowing springs on the site provide an educational opportunity to those aware of the local geology.

Snowmobiling and Vehicular Access

1) The effects of snowmobiling on the site may be quantitatively measured in the spring of 1973. Snowmobile damage, will, I suspect, be heavy, as mentioned earlier in this report. All off-the-road vehicles should not be allowed on-site if the property is purchased. A well defined road system should be identified and maintained. This will require much thought, as there is already heavy human use and misuse of the site.

Forest and Prairie Re-establishment

1) Bottomlands should be allowed to return to prairie status. This can be accelerated via well-known planting procedures, including the seeding of prairie grasses and an appropriate management plan. Maturation and use of the area would not be viable until approximately 3 to 4 years after planting. Such an area and its management and camping use would provide a setting unique to Illinois and midwestern camping. It is an exciting possibility to me. However, creek water quality must first be dealt with.

Forest and Prairie Re-establishment (Con'd.)

2) Forest re-establishment on the presently cropped upland plateaus is a long term procedure. Long grass prairie can also be introduced there, interspersed with openings for camping, as on the bottomlands. If tree planting is done, competition from prairie species may initially kill tree seedlings. However, natural encroachment would gradually narrow the grass area as the forest expands.

Noise Pollution

1) Except in some of the ravines, noise levels are high all over the site. Road noises from the highway are particularly objectionable on the south bluff of "Devil's Backbone" and into the site from the east. Railroad noise enters from the north, and steam escapes from the silica plant to the west. This is unsatisfactory to my concept of isolated, small group camping.

Compaction

1) Much of the land has experienced heavy compaction pressures. To avoid this, trails must be delineated and kept to. Such action will also benefit wildlife. In addition, a campsite management and rotation system should be in operation so as to protect the existant vegetation and wood supply. Horse trails do little for vegetation. Deterioration is not only in the form of the obvious, such as erosion, but also may involve the loss of flowering plants.

2) The carrying capacity of the site also has to do directly with the number of persons on site over a given period of time.

Recreation Pressure

1) High densities of people and the facilities needed to provide for their needs are incompatible with the camp purpose as described to me (small group camping) and with the overall ecology of the site.

2) The measurement of the intensity of recreation pressure on an area involves a consideration of the number of people, seasons of the year, and the lengh of time for which the pressure is applied. The length of time for the recovery of the vegetation between periods of trampling (or snowmobiling) must also be considered. For example, the effect of a hundred people spread throughout a season may be slight, while that of ten per day for ten days may be greater, and severe damage may result from a hundred in the space of one hour.

3) Without quantitative measurements, one can only speculate as to the human numbers limitations on this site, especially with regard to the limited area available for small group semi-wilderness camping. Given the large number of variables concerning the site use and land

Recreation Pressure (Con'd.)

management, and cognizant of the probable numbers demands upon the site should it be purchased, I would not speculate on the numbers of people which would be appropriate or detrimental to the site.

4) However, the following sanctions should be imposed on the land use of the site:

a) The plateau and bottomlands should be off-limits to camping during the initial stages of revegetation - approximately three to five years.

b) Stream buffer areas should be established and respected as non-use areas.

c) A portion of the ravine-and-ridge area should be closed off except for small group environmental investigations.

d) Horses, and motorized vehicles should be banned, off of established routes.

Wildlife Management

1) Protection of areas for wildlife would seem to be a must, if the area is to maintain or improve its present level of wildlife. Discouragement of domestic animals and encouragement of people to remain in camp site areas would aid this problem. The limited size of the site, however, may not allow this to happen.

Summary

My recommendation is that, given the understanding and needs of the Illinois Synod concerning camping, as expressed to me by Mr. Livingston and Mr. Mandehr, it is highly questionable that this site will provide answers for those needs.

The area is and will continue to be in the path of expansion from the town of Oregon. Such a location will quite probably experience continued development and population pressures as well as consequent environmental degradation, such as the Gale Creek.

Finally, I would encourage, if the decision is made to acquire the site, a continued program of research and interpretation of the natural elements of the site. The area has many advantages naturally suited to interpretation, including the geological formations, old field successions, dramatic microclimates, and even the seemingly detrimental aspects of noise and stream polution. If this comes to be possible, I would be more than happy to contirubte to such an effort. Thanks.

Mike Helffrich - Naturalist, Plant Ecologist

APPENDIX I

A partial list of woody (some herbaceous) vegetation found on the Illinois Synod Site . . .(roughly 700 acres) as of December 28, 1972. Plants readily visible 12/27/72 - 12/29/72.

PINE FAMILY (Pinaceae)

Pinus strobus	White Pine
Pinus banksiana	Jack Pine
Picea abies l	Norway Spruce
Juniperus virginiana	Red Cedar
Picea	Blue Spruce

LILY FAMILY (Lilaceae)

Smilax species	Several species of Greenbriar

GRASS FAMILY (Graminae)

Agrostis spp.	Bentgrass
Agropyron spp.	Bluestem and Quackgrass
Andropogon Gerardi	Bluestem (Big)
Zea mays	Common Corn
Sorgastrum nutans	Indian Grass
Poa spp.	Bluegrass species
Bromus spp.	Bromegrass

WILLOW FAMILY (Salicaceae)

Salix nigra	Black Willow
Salix spp.	Other Willow species
Populus deltoides	Eastern Cottonwood
Populus tremuloides	Quaking Aspen
Populus grandidentata	Big-Toothed Aspen

WALNUT FAMILY (Juglandaceae)

Juglans nigra	Black Walnut
Carya ovata	Shagbark Hickory
Carya cordiformis	Bitternut Hickory
Carya tomentosa	Mockernut Hickory

HAZELNUT FAMILY (Corylaceae)

Corylus americana	American Hazelnut
Carpinus caroliniana	Ironwood
Alnus serrulata	Common Alder

BEECH FAMILY (Fagaceae)

Quercus alba	White Oak
Quercus palustina	Pin Oak
Quercus velutina	Black Oak
Quercus rubra	Red Oak
Quercus muehlenbergii	Chinquapin Oak
Quercus macrocarpa	Burr Oak

ELM FAMILY (Ulmaceae)

Ulmus americana	American Elm
Ulmus nubra	Slippery Elm
Celtis occidentalis	Hackberry
Ulmus thomasi	Rock Elm

MULBERRY FAMILY (Moraceae)

Morus rubra	Red Mulberry

CROWFOOT FAMILY (Ranunculaceae)

Clematis virginiana	Common Virgins - Bower

MOONSEED FAMILY (Menispermaceae)

Menispermum canadense	Canada Moonseed

SAXIFRAGE FAMILY (Saxifragaceae)

Ribes spp.	Wild Currants and Gooseberries

WITCH HAZEL (Hamamelidaceae)

Hamamelis virginiana	Witch Hazel

ROSE FAMILY (Rosaceae)

Aronia spp.	Chokeberries
Pyrus spp.	Apple, etc.
Crategus spp.	Hawthorns
Potentilla spp.	Cinquefoils
Rubus spp.	Blackberries, Raspberries, Dewberries
Amelanchier spp.	Juneberries, Serviceberries
Rosa spp.	Roses
Prunus spp.	Various Cherries and Plums
Cotoneaster pyracantha	Firethorn

PEA FAMILY (Leguminosae)	
Gleditsia triacanthos	Honey Locust
Robina pseudo-acacia	Black Locust
Xanthoxylem americanum	Northern Prickly Ash
Gymnocladus diocia	Kentuck Coffee Tree
Cercis canadensis	Redbud
Lespediza bicolor	Lespediza
Ptelea trifoliata	Hop Tree
CASHEW FAMILY (Anacardiaceae)	
Rhus glabra	Smooth Sumac
Rhus typhina	Staghorn Sumac
Rhus radicans	Poison Ivy
STAFFTREE FAMILY (Celastraceae)	
Celastris scandens	American Bittersweet
MAPLE FAMILY (Aceraceae)	
Acer saccharinum	Silver Maple
Acer saccharum	Sugar Maple
Acer nigrum	Black Maple
Acer negundo	Ashleaf Maple
VINE FAMILY (Vinaceae)	
Parthenocissus quinquefolia	Virginia Creeper
Vitis spp.	Grapes
BASSWOOD FAMILY (Tiliaceae)	
Tillia americana	American Basswood
DOGWOOD FAMILY (Cornaceae)	
Cornus stolonifera	Red-Osier Dogwood
HEATH FAMILY (Ericaceae)	
Chamaedaphus calyculata	Trailing Arbutus
Vaccinium spp.	Blueberries
OLIVE FAMILY (Oleaceae)	
Fraxinus nigra	Black Ash

Fraxinus pennsylvanica var. subintegerrima		Green Ash

HONEYSUCKLE FAMILY (Caprifoleaceae)

Sambucus canadense	Co	Common Elder
Viburnum trilobum		Highbush Cranberry
Lonicera xylosteum		European Honeysuckle
Diervilla lonicera		Northern Bush Honeysuckle

HERBACEOUS PLANT REMAINS (Winter)

Figwort	Lamb's Quarters
Milkweed	Mustards
Goldenrod	Thistles
Mullein	Mints
Sunflowers	Motherwort
Asters	Strawberries
Queen-Anne's-Lace	Lichens
Cow Parsnip	Lopseed
Giant Ragweed	Bracken Fern
Ragweed	Spinulose Shield Fern
Dandelions	Vervain'
Nettles (Stinging)	Club Mosses (Lycopodium)
Wood Nettles	Equisetum
Hacklea	Tick-Trefoil
Jewelweed	Cleavers
Dock	Burdock
Amaranth	Beggar's Tick
Burr Cucumber	Chicory

APPENDIX II

A partial listing of Fauna (principally mammals) on the site.

WINTER BIRDS SIGHTED

Downy Woodpecker
Red-Headed Woodpecker
Blue Jay
Crow
Black-Capped Chickadee
White Breasted Nuthatch
Cardinal
Slate-Colored Junco
Eastern Chipping Sparrow
Tufted Titmouse

MAMMALS

Opossum
Masked Shrew
Least Shrew
Shorttail Shrew
Eastern Shrew
Keen Myotis
Little Brown Myotis
Indiana Myotis
Small-Footed Myotis
Silver-Haired Bat
Eastern Pipistrel
Red Bat
Big Brown Bat
Hoary Bat
Evening Bat
Raccoon
Least Weasel
Longtail Weasel
Mink
Striped Skunk
Red Fox
Woodchuck
13-Lined Grown Squirrel
Franklin Ground Squirrel
Eastern Chipmunk
Eastern Grey Squirrel
Eastern Fox Squirrel
Red Squirrel
Southern Flying Squirrel
Western Harvest Mouse
White-Footed Mouse
Deer Mouse
Meadow Vole
Prairie Vole
Pine Vole
Meadow Jumping Mouse
Eastern Cottontail
Whitetail Deer