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Dean M. Roosa

*State Preserves Advisory Board*

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## Natural Heritage Protection in the "Driftless Area"

DEAN M. ROOSA<sup>1</sup>

State Preserves Advisory Board, Wallace Office Building, Des Moines, Iowa 50319

The heavily dissected terrain of northeastern Iowa and adjacent parts of Minnesota, Illinois, and Wisconsin, historically known as the "Driftless Area" has an array of unusual or unique biotic, cultural, and geological amenities. As these features become better known, a greater awareness is emerging, as is a heightened concern for saving the outstanding examples of each community, culture, historical site, and geological feature. Each of the states has a natural area program and has developed a list of natural communities including those of the Driftless Area. Each state's program relative to the Driftless Area is given, with emphasis on Iowa, and preservation needs for the future are delineated.

INDEX DESCRIPTORS: Driftless Area, Paleozoic Plateau, preservation needs, scientific areas.

The "Driftless Area" covers approximately 15,000 square miles in portions of Illinois, Iowa, Minnesota, and Wisconsin, and is of outstanding geological, historical, cultural, and ecological importance as explained elsewhere in this issue. Its importance as a refugium during Pleistocene glaciation has been addressed by Cushings (1965), Hartley (1966), and Curtis (1959). Research findings during the past five years have enhanced scientists' and preservationists' view of the area.

For decades, Iowa scientists have lauded the special nature of the rugged terrain of northeast Iowa and have made pleas for its protection (e.g. Shimek, 1935, 1948; Conard, 1952). The Iowa Twenty-Five Year Conservation Plan (Crane and Olcott, 1933) called for preservation of scenic, historic, and scientific preserves and sanctuaries. It was not until the formation of natural areas programs in state government and establishment of state chapters of Nature Conservancy, both in the 1960s, that specific preservation needs of the Driftless Area were addressed.

More recently, using protection of molluscan diversity as an argument, Imlay (1973a, 1973b) made a strong plea for protecting the Driftless Area as a national park. Pointing out the importance of the area as habitat for endemic snails and clams, and for endangered members of molluscan fauna, he made this plea stating, "The Driftless Area is perhaps a priceless preview of the future. This is what a far vaster area is predicted to be like prior to the next glacial period. The Driftless Area must be protected not only for its beauty . . . but also as a possible 'seed' area for post-glacial redistribution of species. There is, in summary, a strong case for a Driftless Area national, state, and/or local park system which would include portions of Minnesota, Wisconsin, Iowa, and Illinois."

Based on this call for a Driftless Area national park, and in an attempt to further coordinate the programs of the states with each other and with federal and nonprofit conservation organizations, a meeting was convened in Guttenberg, Iowa, in July, 1982. Attending were members of natural area programs from the four states, representatives of The Nature Conservancy, U.S. Fish and Wildlife Service (endangered species office), Conservation and Preserves Committee of the Iowa Academy of Science, and the Iowa Geological Survey. Each state has instituted an inventory program to compile information on natural history, and has developed a community classification system. At the meeting, it was decided that each state would attempt to increase public awareness of its portion of the "Driftless Area" by, for example, sponsoring symposia, cooperating in developing a brochure, and by devoting an issue of the official agency magazine to this landscape.

A second meeting was held at the Natural Areas Workshop at Wyalusing State Park, Wisconsin, in October, 1982, to further elaborate protection plans involving the various agencies and organizations. Some basic points regarding significant features of this landform and the status of each protection program are presented below.

### Endangered or Threatened Species

In Iowa, all five species which occur on the federal list and which spend a portion of their life cycle in Iowa occur in the Driftless Area. These are: Northern Wild Monkshood (*Aconitum noveboracense*), nine populations with over twenty sites; Iowa Pleistocene Land Snail (*Discus macclintocki*), fifteen populations with one population in Illinois; Higgins Eye Mussel (*Lampsilis higginsii*), at least seven populations in the Mississippi River in the portion of the Driftless Area; Bald Eagle (*Haliaeetus leucocephalus*), the only recent nesting and several winter roosts along the Mississippi River; and Indiana Bat (*Myotis sodalis*), found in caves in winter in the Dubuque County portion of this landform. Further, several candidates for federal listing are found here. The occurrence of these species has caused the U.S. Fish and Wildlife Service to become involved in protection efforts in this landform region.

### Geological Features

Perhaps the most spectacular aspect of the "Driftless Area" or broader Paleozoic Plateau (see elsewhere, this issue) are the geological features. Here karst topography has developed, allowing the formation of sinkholes, subterranean caverns, perennial groundwater springs, and cold producing crevices (glaciers). Here also are deeply entrenched streams, abundant outcrops of dolomitic limestone, and soft St. Peter and St. Croix sandstones. Of lesser magnitude are sand deposits, high terraces of sand and gravel, and outcrops of Cambrian-age Jordan sandstone. It is this special geology that sets the stage for the occurrence of unusual biota.

### Natural Communities

Each state, in conjunction with its inventory program, has devised a community classification system. In Iowa's portion of the Driftless Area or Paleozoic Plateau, the following communities have been described:

upland forest	seep
floodplain forest	shrub wetland
sand forest	floodplain lake
sand prairie	spring
hill prairie	coldwater stream
algific talus slope	floodplain side channel
sandstone glade	backwater slough
limestone glade	intermittent stream
St. Peter sandstone cliff	perennial stream
Pennsylvanian sandstone cliff	river
limestone cliff	active solutional cave
sand barren	inactive solutional cave
eroding slope	mechanically formed cave
floodplain marsh	underground stream

The combined efforts of the State Preserves Board, Iowa Chapter of The Nature Conservancy, Iowa Natural Heritage Foundation, County Conservation Boards, and Iowa Conservation Commission will, in the upcoming few years, attempt to protect the diversity of this landform by protection of examples of each of the communities listed above. Some of the areas already under protection will be described later.

### Synopsis of State's Programs

**Illinois:** Approximately 580 square miles (371,000 acres) are found in the "Wisconsin Driftless Area" natural region of Illinois (White, 1981). At present, no natural areas have been formally dedicated, but several, including an algific talus slope, a hill prairie, and an upland woodland, are pending (John Schwegman, personal communication). A national natural landmark, located in the Mississippi Palisades State Park, is managed as a scientific area. The Illinois Department of Conservation devoted a portion of its December 5, 1983, magazine to the Illinois portion of the Driftless Area (see The Great Northwest pgs. 15-17, Wisconsin Driftless Division, Outdoor Highlights Vol. 11). The Department of Conservation has an active "landmark registry" program, a voluntary registration which gives a limited amount of protection to a site.

**Minnesota:** Approximately 1060 square miles (678,400 acres) of "Driftless Area" occur in Minnesota (Bob Djupstrom, personal communication). Presently five dedicated natural areas exist, including algific slopes, hill prairies, and sand dunes.

**Wisconsin:** With 10,500 square miles (6,720,000) acres, Wisconsin has by far the greatest amount of Driftless Area. Forty scientific areas have been protected by preserve designation; these include 10 prairies of various types, 10 dry mesic forest sites, geological features with boreal relict species, river bottoms, sand bottoms, a cave, and railroad prairie remnants (Cliff Germain, personal communication). The state of Wisconsin has inventoried this portion of the state in regard to natural areas, and is preparing to repeat the inventory.

**Iowa:** The northeastern portion of Iowa contains approximately 1500 square miles (970,000 acres) of what has historically been termed the "Driftless Area" (Trowbridge, 1966). A more modern appraisal of the geology and Pleistocene history of this region has recently been put forward (Prior, 1976; Hallberg, et al, this issue), urging a broader concept based on topography and suggesting the use of the term Paleozoic Plateau to include a broader area than the traditional Driftless Area, and one more easily delineated. This area, with slightly less than 2500 square miles (1.6 million acres) (Roosa and Koenig, unpubl. ms) includes all or portions of Allamakee, Clayton, Dubuque, Fayette, Howard, Jackson, and Winneshiek Counties.

In this region, the state of Iowa, through the State Conservation Commission, State Preserves Board, and county conservation boards, has had an active land acquisition program. Here the Upper Iowa River, nominated for the federal Wild and Scenic Rivers program, provides some of the most spectacular scenery in Iowa. In the Paleozoic Plateau, the state of Iowa owns approximately 23,700 acres of land, exclusive of sovereign lands, open to the public. Of this total, 17 areas, encompassing slightly over 1,500 acres, have been formally dedicated as state preserves.

### Recent Research

Research sponsored by the state of Iowa through the State Preserves Advisory Board, and through money obtained through the U.S. Fish and Wildlife Service through Section 6 funds of the Endangered Species Act and Pittman-Robertson funds, has documented the distribution and abundance of the following species: River Otter (*Lutra canadensis*), Evening Bat (*Nyctecius humeralis*), Keene's Myotis (*Myotis septentrionalis*), Indiana Bat (*Myotis sodalis*), Iowa Pleistocene Snail (*Discus macclintocki*), and Higgins' Eye Mussel (*Lampsilis bigginsi*). These projects, coupled with those sponsored by the Iowa Natural

Areas Inventory, have resulted in a new and heightened perception of the biotic uniqueness of the Paleozoic Plateau.

### STATE PRESERVES OF NORTHEAST IOWA

The rugged landscape of northeast Iowa — Paleozoic Plateau, or Little Switzerland of Iowa — contains the greatest natural diversity in our state. From tiny land snails to giant pine trees; from cool, moist, mossy slopes to hot, dry hill prairies; from small trout streams to a giant river — and nearly everything in between. There have been numerous pleas through the years for preservation programs, beginning even late in the last century. Louis Pammel, Bohumil Shimek, and Thomas Macbride, giants of Iowa natural area preservation, all extolled the virtues of the Driftless Area and spoke for saving those scenic and scientific gems. All these men were among the founders of the McGregor Wildlife School which did so much to further the preservation of natural areas.

The State Conservation Commission, county conservation boards, The Nature Conservancy, and the State Preserves Advisory Board have been influential in protecting significant tracts in northeast Iowa. The State Preserves System will be highlighted here.

The State Preserves Advisory Board was created by legislative action in 1965. It consists of seven members, appointed by the Governor. It is the responsibility of this board to establish a statewide system of preserves. If an area is of sufficient quality to be considered as a state preserve, the State Preserves Advisory Board recommends to the Conservation Commission and the Governor that it be formally designated. Once designated as a state preserve, it is afforded protection under Chapter 111B, Code of Iowa, and is declared "put to its highest, best and most important use for public benefit. It shall be held in trust and shall not be alienated except to another public use upon finding by the board of imperative and unavoidable public necessity and with the approval of the state conservation commission, the general assembly by concurrent resolution, and the governor." It may not be taken under the condemnation statutes of the state without such finding. This means a state preserve area is safe from pipelines, highways, utility corridors — any type of intrusion not in keeping with the original intended use of the area upon being designated as a state preserve. The goal of the State Preserves Advisory Board is to preserve at least one example of each type of natural community, archaeological site, historical site, and geological site in the Driftless Area. Presently, there are 17 state preserves in the Paleozoic Plateau. These are briefly described below:

**Bixby State Preserve:** Located in southern Clayton County, this 184-acre area is managed by the Clayton County Conservation Board. It has been of interest to botanists and geologists since before the turn of the century because it contains splendid examples of geological formations associated with the Niagara escarpment, and requisite habitat for numerous rare plant species such as dwarf scouring rush, muskroot, ground pine, and northern currant. It contains a glaciere and several very unusual lichens. It is a fragile area, easily damaged by visitors. Its great significance is evidenced by the occurrence of two species which are listed on the federal endangered and threatened species list, and at least nine which appear on the state's endangered species list.

**Bluffton Fir Stand:** A 94-acre area located near the small town of Bluffton in northern Winneshiek County. It is the largest known remnant of Balsam Fir (*Abies balsamea*) in Iowa. These relatively few trees remain from the many that grew here during post-glacial times. On a steep, north-facing slope, a cool, moist micro-climate results from limited sunshine and protection from drying winds, and provides an environment similar to that of a much earlier time. On this slope is a complex of boreal species, including some of our rarest mosses. Unusual vascular plants include northern lungwort, water

speedwell, paper birch, rattlesnake plantain, Canada yew, and white pine.

**Brush Creek Canyon:** This 217-acre natural area is located near Arlington in Fayette County and is owned and managed by the State Conservation Commission. Brush Creek winds through a rocky, steep-sided, wooded gorge. Limestone outcrops furnish many plant habitats, as do the valley flats adjoining the stream. The preserve provides habitat for at least 268 species of vascular plants, some of which are boreal relicts. Examples are Canada yew, shinleaf, sullivan-tia, and cliff brake fern. The preserve is significant geologically as its steep slopes and exposed bedrock mark important changes in regional landscape patterns and in the age of underlying bedrock formations. The steep bluffs are formed by outcropping Niagaran dolomite, a particularly resistant Silurian formation. The land surface southwest of the preserve is open and gently rolling in marked contrast to the sharply dissected terrain encountered at the preserve and to the northeast.

**Coldwater Cave Spring:** This geological and nature preserve is located northwest of Bluffton in Winneshiek County and is owned and managed by the State Conservation Commission. Coldwater Spring issues from beneath a towering bluff of Ordovician-age Galena dolomite. The spring marks the primary natural entrance of Iowa's largest known underground cavern system. The cave, located beneath private property, contains stalagmites, stalactites, and colorful flowstone formations in an atmosphere that remains at 47° Fahrenheit throughout the year.

**Decorah Ice Cave:** Located at the north edge of Decorah in Winneshiek County, the Decorah ice cave is owned and managed by the Decorah Parks and Recreation Department. The ice cave underlies a wooded bluff of Ordovician-age Galena dolomite along the Upper Iowa River. It is the largest ice cave in eastern North America and has unique geological features, a history of scientific investigation and an international reputation. The cave passage follows an enlarged joint fracture or crevice, expanded in part by the slippage of large blocks downslope. The cave has natural deposits of ice which coat the walls beginning in March and remain until August or September. The cave was formerly commercially shown and was featured in Ripley's "Believe It or Not" column in 1932.

**Fish Farm Indian Mounds:** Located near New Albin in Allamakee County, this archaeological area is owned and managed by the State Conservation Commission. At least 28 mounds are located on an ancient terrace overlooking the Mississippi River. They were built by prehistoric peoples of the Hopewellian culture between 250 B.C. and 350 A.D. This mound group is one of the few remaining of the many that dotted hilltops and terraces along the rivers at the time of settlement; most have been destroyed by cultivation and pillaging.

**Fort Atkinson State Preserve:** Located on the northwest edge of the town of Fort Atkinson, this fort was established as a federal military post in 1840 to protect the Winnebago Indians from the Sioux. The major buildings, stockade, and fort well were built between 1842 and 1845 from limestone quarried nearby. The fort was abandoned in 1849 and in 1853 was auctioned off to private owners. In the 1930s, the State Conservation Commission acquired the fort and has recently reconstructed the palisade and some buildings. There is a museum located in a building formerly used as a barracks.

The quarry west of the fort furnished stone for the foundations and buildings of the fort complex. This limestone contains abundant fossil crinoids, resistant nodules of chert and occasional fossil brachiopods. This quarry is the "type section" of the limestone member of the Maquoketa formation. (A type section is a location where the rocks are most typically exposed and may be used as a reference in later studies.)

**Hartley Fort:** Located near New Albin in Allamakee County, this privately owned preserve marks the site of prehistoric fortified Indian encampment situated on a terrace overlooking the Upper Iowa River. Built in approximately 900 A.D., the stockaded fort may have protected the Woodland Indians from Oneota people.

**Little Maquoketa River Mounds:** Located near Sageville in Dubuque County, this 24-acre preserve is owned by the state of Iowa and managed by the Dubuque County Conservation Board. The complex of 24 conical and linear mounds was discovered in 1977 during studies related to the Great River Road project. The mounds sit atop a bluff and are attributed to the Woodland Indians who occupied the area from 1300 - 700 A.D. The mounds range in height from 10 to 50 inches, and from 12 to 40 feet in diameter.

Development of the area was in accordance with native American concerns that burial mounds not be disturbed. A fence surrounding the mounds prevents visitors from walking on the mounds. A parking lot along the highway, a trail leading up the 200-foot bluff, and a scenic overlook of a spectacular view enhance visitor enjoyment. Geologically, the site provides a view of the best known example in Iowa of "stream piracy." This occurred when the Little Maquoketa River was diverted from a tight bend to a shorter, more direct route to the Mississippi River.

**Merritt Forest:** Located in Clayton County, near the town of Millville, this 20-acre woodland is owned and managed by the State Conservation Commission. It was donated to the state of Iowa by the Merritt family to be maintained as a state preserve. It is a near-virgin woodland dominated by oaks, maples, and basswoods, with occasional walnuts, hickories, and elms. The woodland slopes gently toward the Turkey River, located about a half-mile north. Abundant wildflowers, ferns, mosses, and lichens are found here.

**Mossy Glen:** This is an 80-acre woodland, located several miles northwest of Edgewood. This outstanding mature woodland was donated to the state of Iowa by Mrs. Mildred Hatch in memory of her father, Charles A. Hesner, and her uncle, Henry Hesner. It is located on the Niagara escarpment and contains geological features typical of the Driftless Area of northeast Iowa. It is a superb natural area, with numerous rare or unusual plants. It is also rich in legends of moonshiners taking refuge here and of tales of mysterious murders. A locally known man called himself the "poet of Mossy Glen." Its rich history, important geological features, and native flora make it one of Iowa's natural treasures.

**Retz Memorial Woods:** This 49-acre woodland is located southeast of Elkader. It is owned and managed by The Nature Conservancy. A haven for many spring wildflowers, it is a mature upland woods dominated by oaks, sugar maples, and basswood. The rugged topography of the area and the relatively undisturbed condition result in habitat for a great diversity of plant life. Massive limestone blocks are present and covered with lush growths of mosses, lichens, liverworts, and walking ferns.

**Roggman Boreal Slopes:** This 20-acre site, owned by The Nature Conservancy, is located near Garnaville in Clayton County. It is an important site for the protection of endangered, threatened, and rare species of plants and animals. It was donated to The Nature Conservancy by Arnold Roggman and Bernadine Fierte in honor of their parents, Charles and Anna Roggman. Some of Iowa's rarest plants occur on this north-facing, rather steep slope, so fragile that damage is caused by walking on it. It is open for visitation only by special permit.

**St. James Lutheran Church:** This historical preserve is located on the west edge of the town of Fort Atkinson, adjacent to the fort. Built during the period 1840-1850, it served as the site of services held by the German Evangelical Lutheran St. James Church Society. It was abandoned in 1894. The church is similar to the fort buildings in being constructed from stone quarried locally.

**Slinde Mounds:** This archaeological site is located northwest of Waukon and overlooks the Upper Iowa River. It was recently purchased by the state under their "open spaces" program. The mounds are attributed to the Middle and Late Woodland culture of roughly 300 A.D. to 1400 A.D. The preserve is also of natural significance, with native prairie grasses and a view of a deeply entrenched stream meander which exposes underlying bedrock.

**Turkey River Mounds:** A 62-acre tract lying southeast of Guttenberg, this preserve offers some of the most spectacular variation in Iowa. The preserve sits atop a long, narrow, forested ridge that rises 200 feet above the confluence of the Turkey River with the Mississippi River. The steep sides are nearly perpendicular cliffs composed of the Galena dolomite which has weathered into picturesque pinnacles. The preserve contains conical and linear burial mounds built approximately 2,000 years ago. Because of the variety of habitats, it supports an extensive vascular plant flora.

**White Pine Hollow:** This 712-acre forest, situated near Luxemburg in Dubuque County, contains perhaps the largest white pine stand in Iowa. The preserve was investigated by representatives of the National Park Service who determined it to be of sufficient national significance to be designated as a National Natural Landmark, and was so dedicated in 1972. It has proven to be a national treasure as it is habitat for several species that appear on the federal threatend and endangered species list. New discoveries of rare animals and plants continue each year. Much of the preserve was purchased by the Dubuque County Conservation Society in the 1930s and donated to the state. A total of 519 species of vascular plants, 95 species of mosses, and 12 species of liverworts have been identified from the preserve.

#### FUTURE PRESERVATION NEEDS

Because of the rich archaeological history, the high diversity of vegetation, and the presence of rare animals, the rugged portion of northeast Iowa presents a challenge to conservationists and preservationists. Much has been done to protect the diversity; much is left to be done.

#### Archaeology

The majority of the effigy mounds have been destroyed — some in recent years. This makes those remaining all the more precious. An enlightened society such as ours should have enough respect for native peoples to protect all such forms from a prehistoric era. Clark Mallam, Luther College archaeologist, has surveyed the area for remaining effigies, mapping those which are still present, discovering some previously unknown. Rock shelters containing rock carvings, or "petroglyphs," still remain, though many have been vandalized or destroyed. These need the strongest form of protection — for an added dimension to our cultural history and for further interpretation in the future. Although numerous mound sites have been protected, little has been done to protect campsites, forage areas, hunting areas, and winter habitation sites.

#### Natural History

The research by Frest (1982) has revolutionized our thinking about protection strategies for the Iowa portion of this landform. In addition to finding additional sites for the Iowa Pleistocene Land Snail, he discovered at least one species new to science, two glacial relict species, several disjunct species (Frest and Fay, 1981), and described a new biome, the "Algific talus slope." Included in this habitat are several rare vascular plant species, numerous rare bryophytes, a relic snail fauna, and two federally threatened or endangered species. Frest's work has provided the basis for a preservation strategy now being pursued by the State of Iowa and the Iowa Chapter of The Nature Conservancy.

An attempt is presently being made by the Iowa Natural Areas Inventory to locate all the hill prairies in northeast Iowa. Numerous prairies exist; however, none are in state ownership. While fairly common in Wisconsin and Illinois, they are a rarity in Iowa due to the aspect of the bluffs. They provide habitat for plants not found elsewhere. The most outstanding examples should be protected.

Perhaps one of our most endangered habitats is the floodplain forest. This is proving to be valuable for certain sensitive species of animals, mainly birds. It is imperative that we locate examples of this rapidly disappearing community and provide protection. It is here that the red-shouldered hawk, brown creeper, and other unusual birds nest. These woodlands provide migration corridors for mammals and birds.

Streams like the Upper Iowa, Yellow, Volga, and Turkey are treasures, some nationally prominent. The "Protected Waters Program" of the State Conservation Commission will go a long way towards providing them with adequate protection. Acquisition by state and county agencies should continue and be accelerated. In addition to providing animal and plant habitat, these streams are a precious recreational resource and will become even more so in the upcoming years.

Undisturbed upland forests are becoming increasingly uncommon. These are utilized by a wide variety of organisms, many of which require extensive tracts of woodland. We must rapidly locate and protect the best remaining examples of this community-type.

#### Historical Sites

The grinding mills along northeast Iowa streams have not been adequately addressed by preservation organizations. There are a few excellent examples remaining; these should be restored as living history lessons. Fort Atkinson stockade, unique among forts, should be enlarged to include the perimeter buildings. Portions of the trail that connected Fort Crawford and Fort Atkinson, still visible in places, should be given permanent protection.

#### EPILOGUE

Much is riding on the conservation and preservation efforts of Iowans in the next decade. The "have not" nations cannot afford to set land aside. Our nation, a "have" nation (and state) cannot afford to fail our land protection responsibility. Future Iowans will judge us as harshly as we judge those who have gone before and failed to adequately provide for us in terms of public recreation areas, natural areas, protection for endangered species, scenic areas, historic sites — places where we can gain solitude and serenity. These places will become more important in the future. We must keep what we have in the Driftless Area, in just consideration of those Iowans not yet born. The continuing parade of new records for biota in the Paleozoic Plateau have provided a new perspective on this exciting landscape. The endemic snails, the plants with restricted distribution, the unusual glaciers, the disjunct plant and animal populations, provide Iowans with a challenge not sufficiently recognized by preceding generations. Due to rapid habitat alteration, we have only a few years to protect the precious remnants of cultural remains, of biotic communities, of historical sites, and scenic rivers in this area — this chance will not pass our way again.

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