DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.60(a) and 36 CFR 251.23, I hereby designate as the Dennison Hollow Research Natural Area the land described in the following establishment record prepared by Max D. Hutchison, Steven Olson, and Stanley Harris, dated July 31, 1987. These lands shall hereafter be administered as a research natural area subject to the above regulations and instructions issued thereunder.

Chief

4/6/89
Date

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APR 7 1989

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

DENNISON HOLLOW

RESEARCH NATURAL AREA

SHAWNEE NATIONAL FOREST

JULY 31, 1987

Dennison Hollow

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983 - 425-976 - 415/6115

FS-6200-7 (10/73)

ERRATA SHEET

1. Authorities for biota nomenclature, unless otherwise noted, are as follows:

Flora:

a. Fernald, M.L., 1950, Gray's manual of botany, 8th ed., American Book Co., NY. 1632p

b. Little, E.L.Jr., 1979, Checklist of United States Trees (Native and Naturalized) Agri Handbook No. 541, Forest Service, USDA.

Fauna:

a. Banks, R.C., R.W. Diarmid, A.L. Gardner, 1987. Checklist of vertebrates of the United States, US Territories, and Canada, Resource Publ. 166, Fish and Wildlife Service, USDI. 81p

b. Holsinger, JR, 1972, The fresh water amphipod crustaceans (Gammaridae) of North Am., Biota of Freshwater Ecosystems. Identification Manual No. 5, EPA. 89p

c. Robins, C.R., R.M. Bailey, C.E. Bond, V.R. Brooker, E.A. Lachorer, R.N. Lea, W. B Scott, 1980. A list of common and scientific names of fishes from the U.S. and Canada, 4th ed., Am. Fisheries Soc., Spec. publ. No. 12, Bethesda, MD. 174p

d. Sutherland, D.W.S, 1978. Common names of insects and related organisms. Entomological Society of America. 132p.

2. Management Precription

a. Hand removal of vegetation. This may be necessary because natural fires have been prevented or controlled in recent years. Once woody vegetation is controllable through prescribed burning or grazing, hand removal of woody vegetation will be unnecessary.

b. Fences are not needed to achieve management objectives.

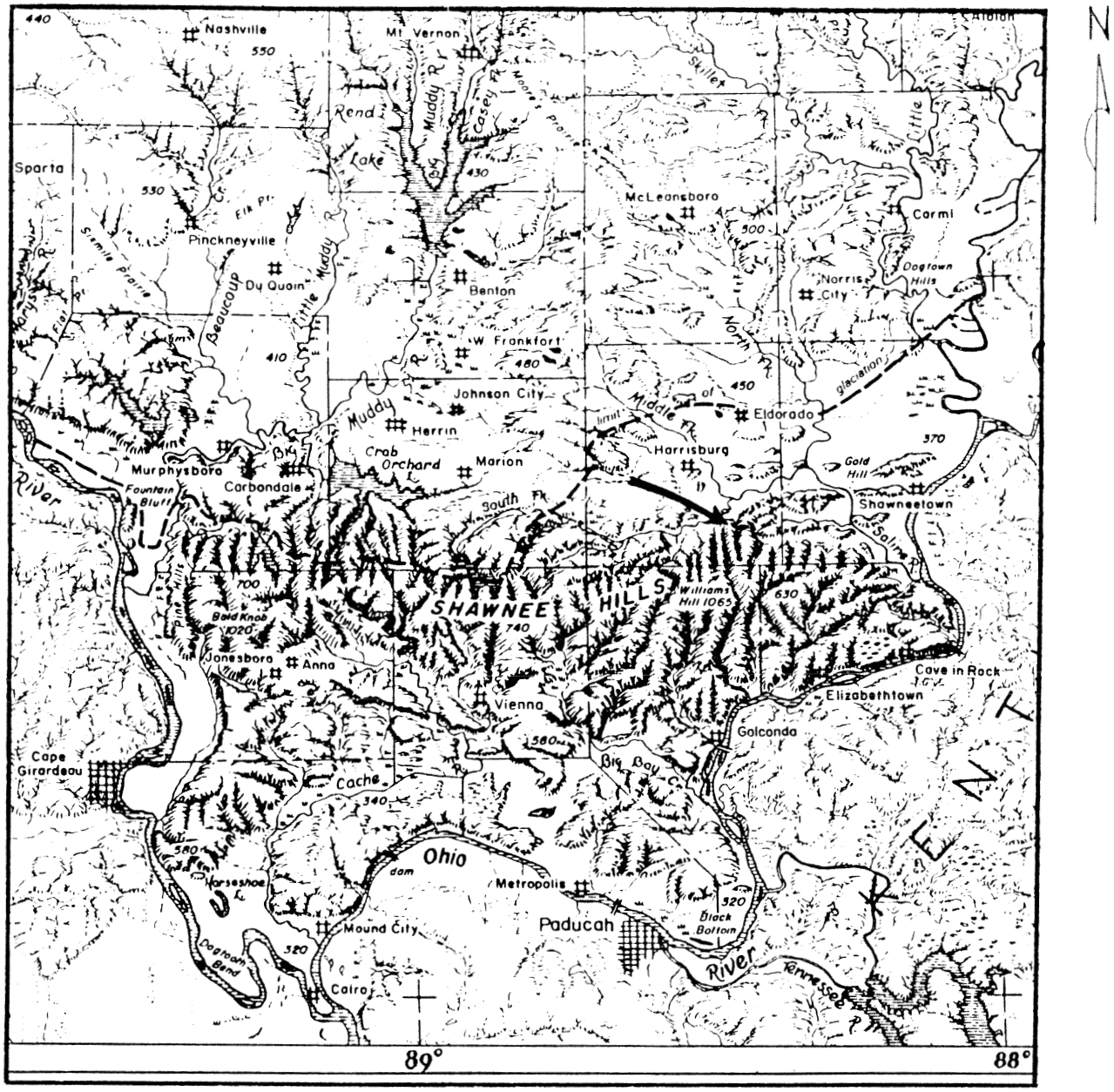

Figure 1. Location of Dennison Hollow Research Natural Area shown (with arrow) on copy of J. A. Bier's Landforms of Illinois map, Ill. State Geol. Surv., Urbana, 1980

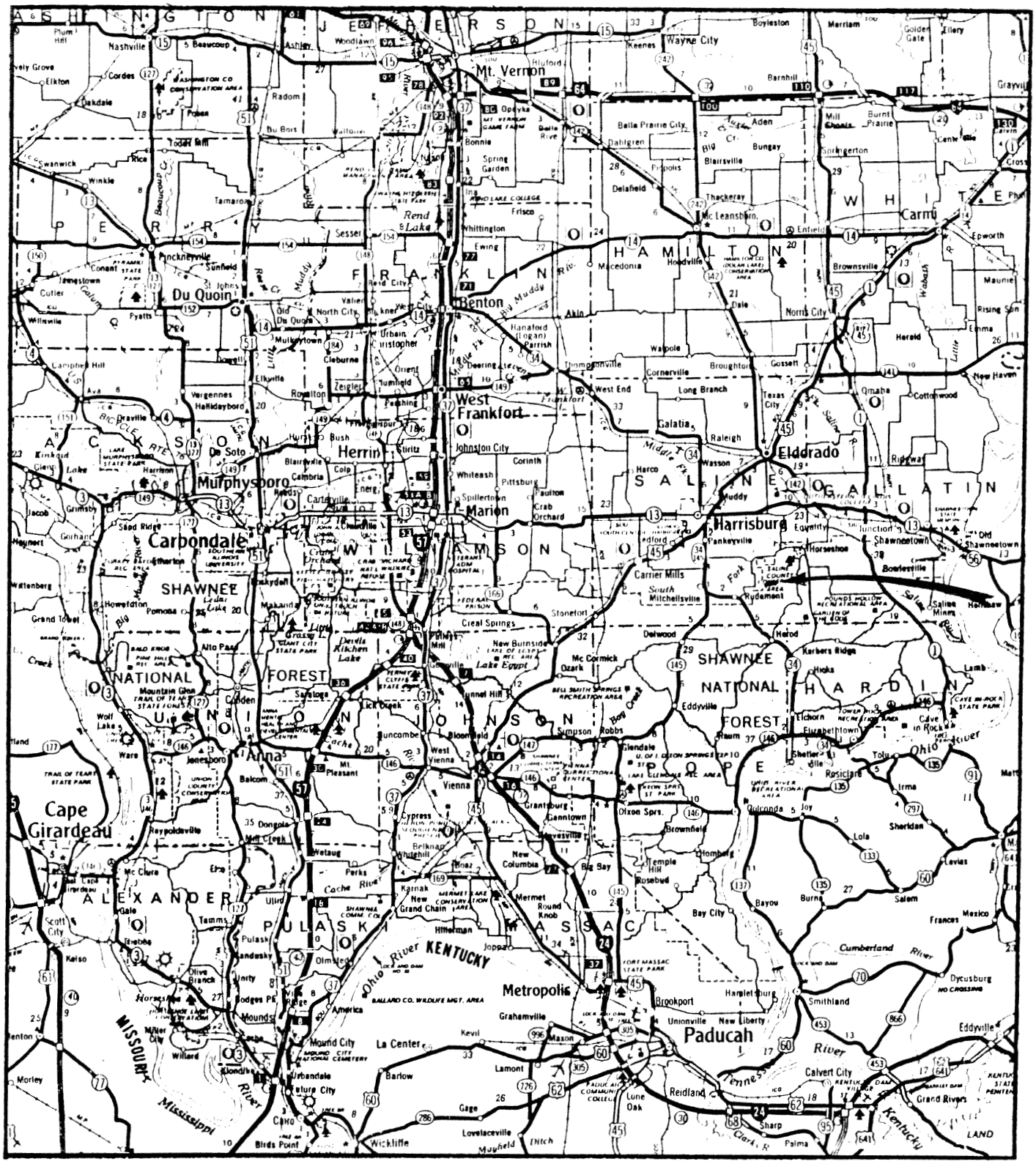

Figure 2. Location of Dennison Hollow Research Natural Area shown (with arrow) on copy of Illinois Official Highway Map, 1985-86, Department of Transportation, Springfield

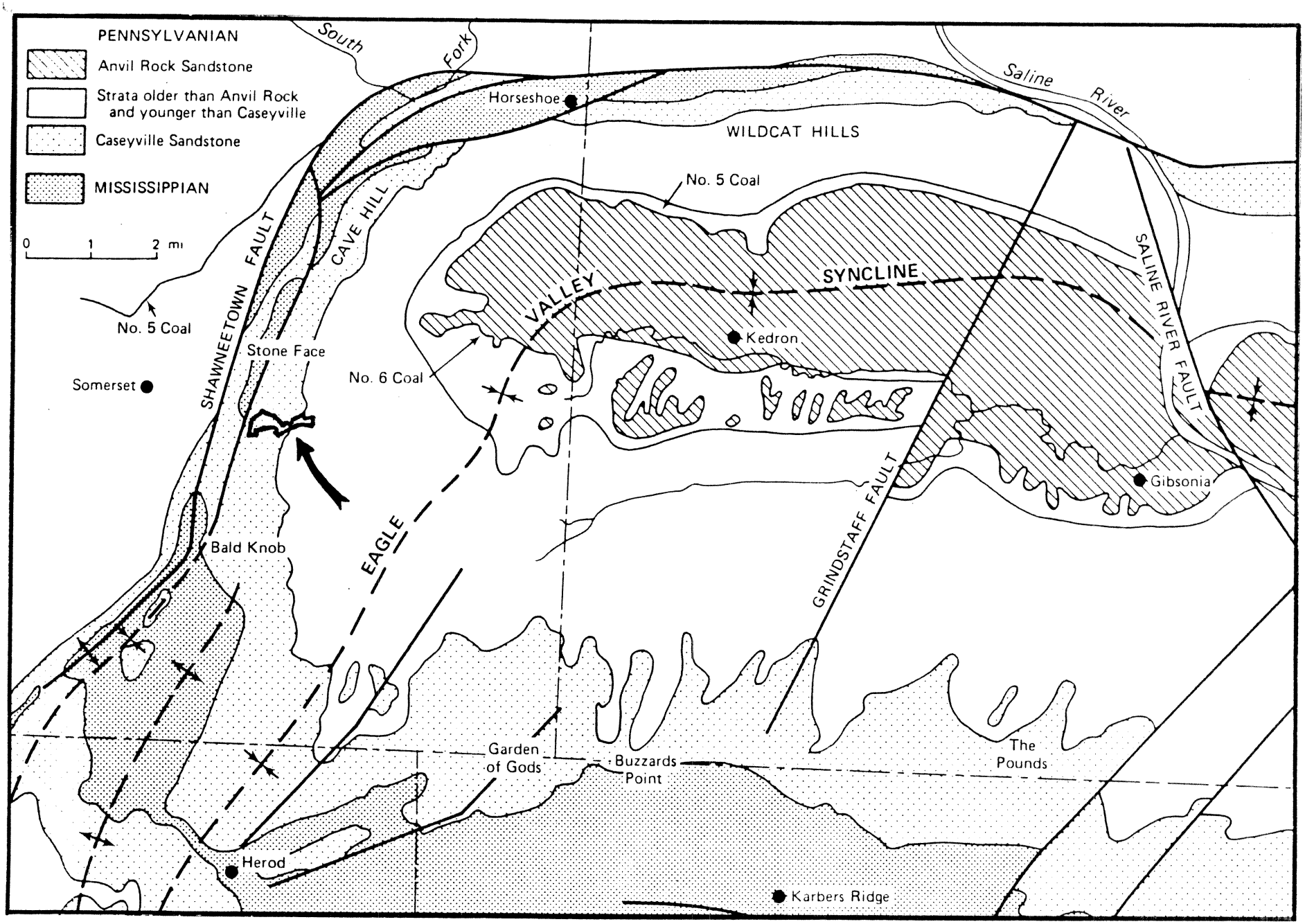

Figure 5. Location of Dennison Hollow Research Natural Area shown (with arrow) on copy of map in A guide to the geology of the Equality area by D. Reinertsen, Illinois State Geological Survey, Field Trip Guide Leaflet 1980A, April, 1980

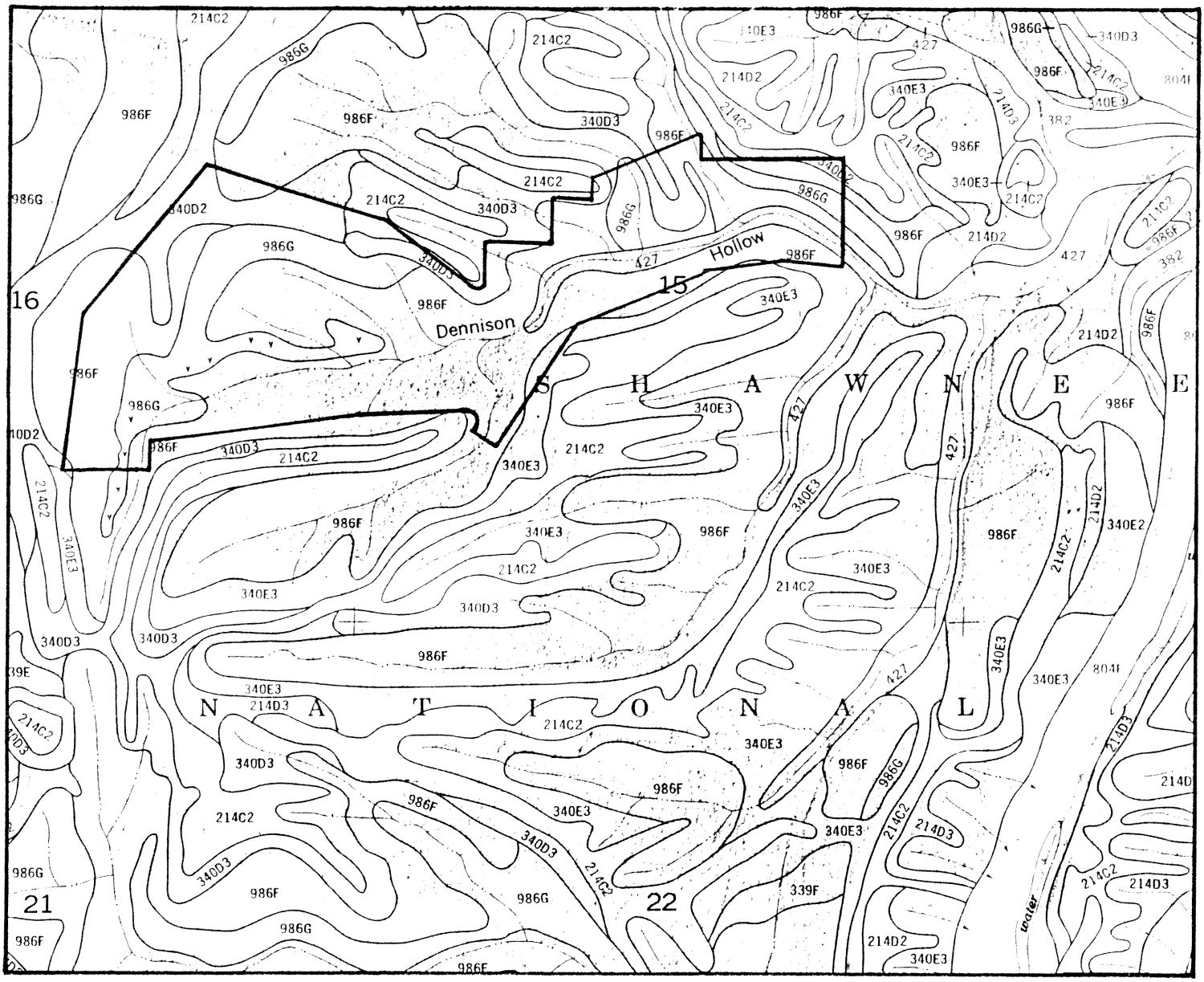

Figure 7. Location of Dennison Hollow Research Natural Area shown on map of soils taken from Soil survey of Saline County, Illinois by C. Miles and B. Weiss, SCS and USFS, in cooperation with Ill. Agr. Exp. Sta., Urbana, 1978

scale 4" = 1 mile

214 - Hosmer silt loam

340 - Zanesville silt loam

986G - Berks-Wellston complex

986F - Wellston-Berks complex

427 - Burnside silt loam

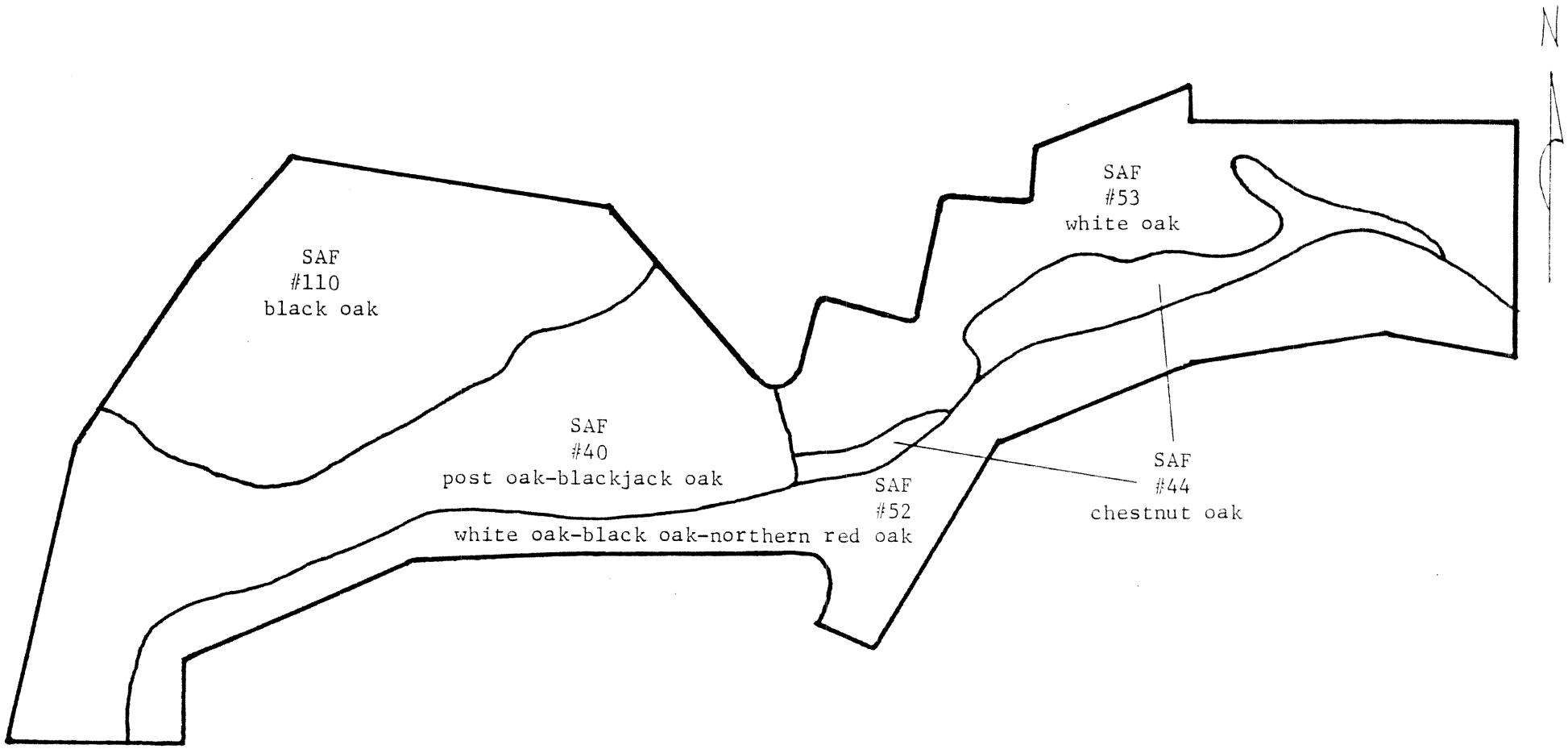

Figure 8. Map of Dennison Hollow Research Natural Area showing SAF area cover types; all of the area is considered to be Kuchler PNV #91 (oak-hickory)

scale 1" = 660'

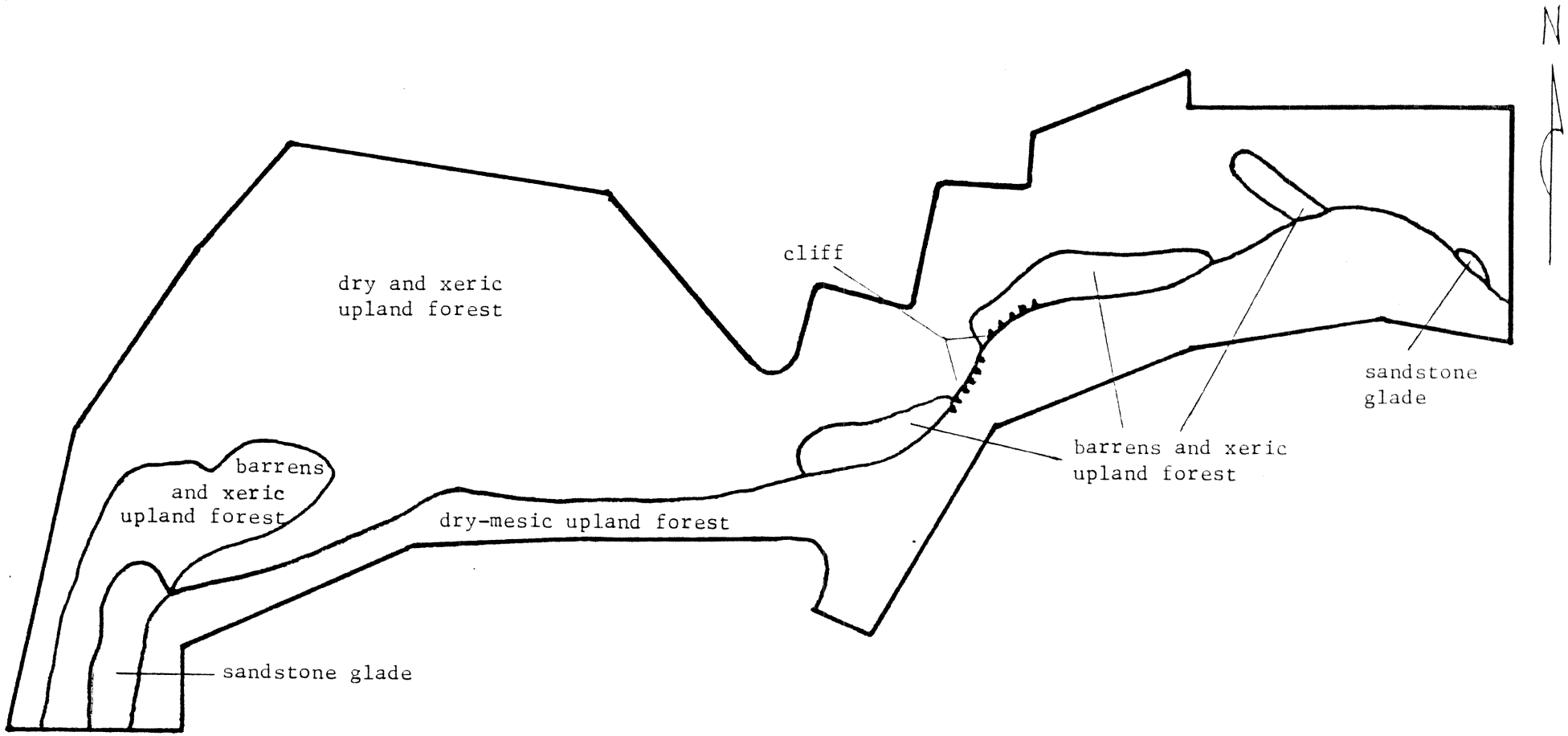

Figure 9. Map of Dennison Hollow Research Natural Area showing natural communities; the cliff community is represented at several small sites by sandstone outcrops occurring intermittantly along the north edge of the stream; these are not all mapped

scale 1" = 660'

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PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: Copy of ASCS photo (Copy made by M. D. Hutchison)

DATE SUBMITTED: July, 1987

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Fig. 10			June 29, 1938	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	aerial view showing location of Dennison Hollow	35 mm. BW

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Fig. 11				Oct. 6, 1981	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	aerial view showing location of Dennison Hollow	35 mm. BW

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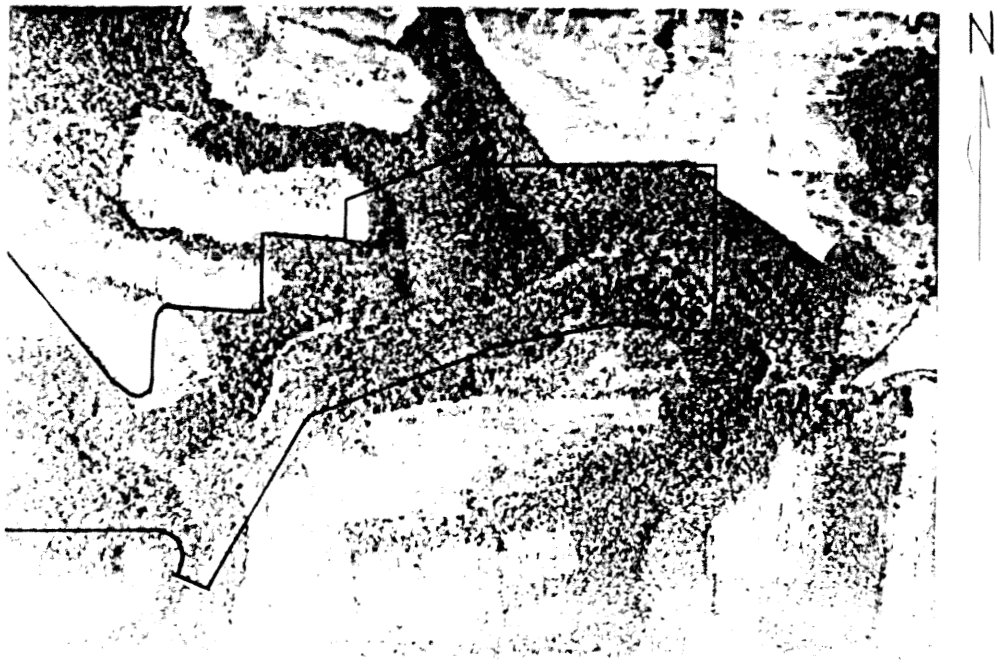

Figure 10. Copy of ASCS aerial photograph taken June 29, 1938 showing location of Dennison Hollow Research Natural Area (east part)

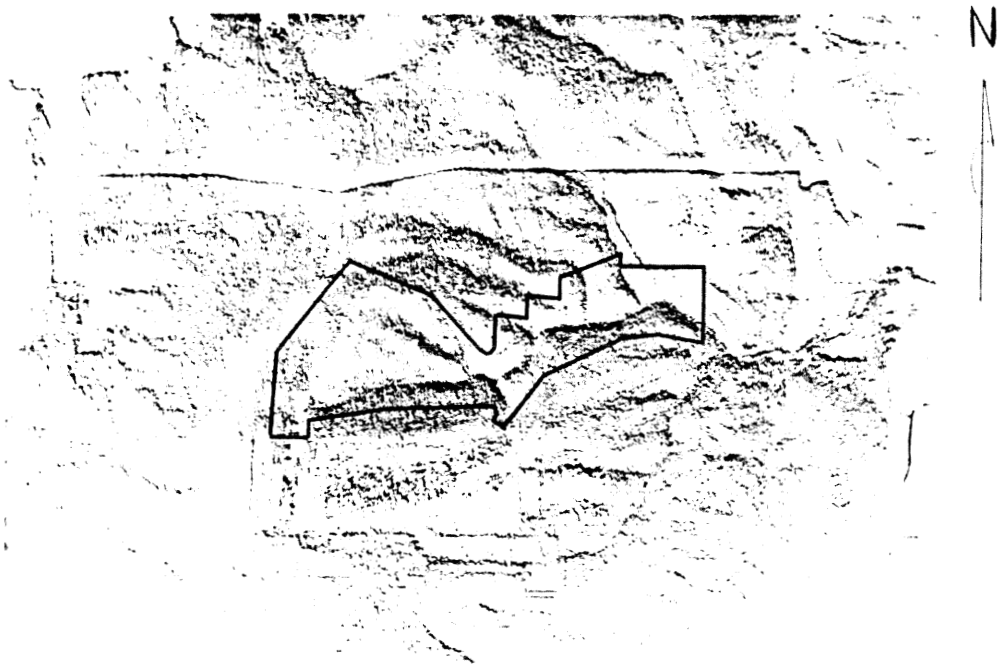

Figure 11. Copy of ASCS aerial photograph taken Oct. 6, 1980 showing location of Dennison Hollow Research Natural Area

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Fig. 12				April 16, 1981	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of rocky slope on north side of valley at Dennison Hollow RNA	35 mm. C

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Fig. 13				June, 1980	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of rocky slope on north side of valley at Dennison Hollow RNA	

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Figure 12. Rocky slope on north side of valley at Dennison Hollow; note thin soils with mosses and lichens; trees are chestnut oaks (Quercus prinus)
-photo taken by M. Hutchison, April 16, 1981

Figure 13. Rocky slope on north side of valley at Dennison Hollow; note movement of sandstone boulders downslope; trees are mostly chestnut oaks (Quercus prinus)
-photo taken by M. Hutchison, June, 1980

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Fig. 14				June, 1980	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of old growth forest on rocky ridge top at Dennison Hollow RNA	35 mm. C

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Fig. 15				June, 1980	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of Goat's-rue (Tephrosia virginiana) growing on the sandstone slopes at Dennison Hollow RNA	35 mm. C

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1600-1 (8/67)

Figure 14. Old growth forest on rocky ridge top at Dennison Hollow Research Natural Area; gnarled, leaning, and bent trees are typical of the chestnut oaks (Quercus prinus) on the drouthy sites -photo taken by M. Hutchison, June, 1980

Figure 15. Goat's-rue (Tephrosia virginiana), a colorful legume that grows on the sandstone slopes at Dennison Hollow RNA - photo taken by M. Hutchison, June, 1980

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Fig. 16			1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	just east of the Dennison Hollow RNA, a cemetery plaque indicating the early date of settlement in the region	35 mm. BW

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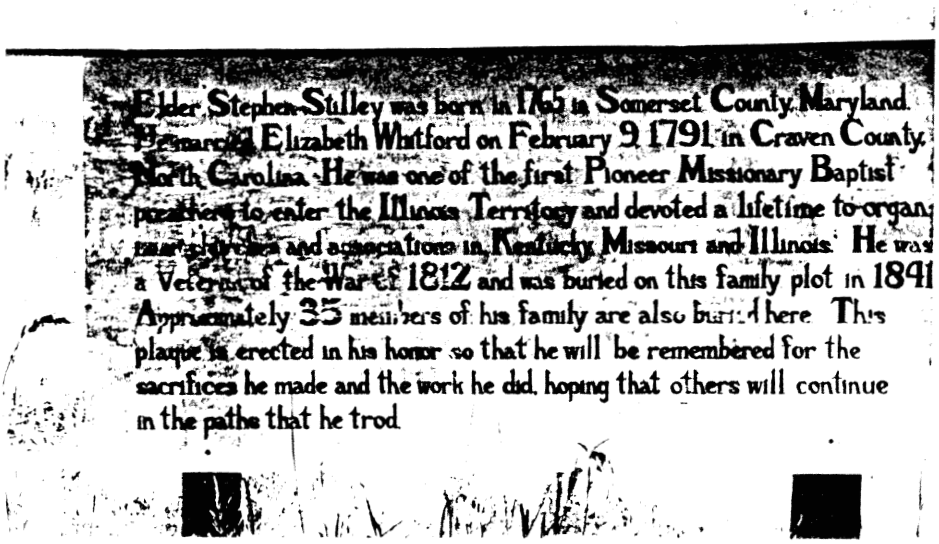

Figure 16. Just to the east of the Dennison Hollow Research Natural Area, there is an old cemetery with a plaque indicating the early date of settlement in the region
- photo of sign at site taken by M. D. Hutchison, 1986

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Fig. 17			Nov. 24, 1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	chestnut oak (Quercus prinus) at Dennison Hollow	35 mm. C

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Figure 17. Chestnut oak (Quercus prinus) growing at base of small sandstone outcrop along south-facing slope at Dennison Hollow - photo by M. Hutchison, Nov. 24, 1986

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Fig. 18				Nov. 24, 1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	chestnut oak (Quercus prinus) at Dennison Hollow	35 mm. C

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Figure 18. Chestnut oaks (Quercus prinus) growing on rocky south-facing slope at Dennison Hollow; note open barrens on upper slope in background
- photo by M. Hutchison, Nov. 24, 1986

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PHOTOGRAPHER: M. D. Hutchison

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Fig. 19			Nov. 24, 1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of south-facing slope at Dennison Hollow	35 mm. C

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Figure 19. View of south-facing slope at Dennison Hollow showing outcrops of sandstone; trees are white oaks (Quercus alba) - photo by M. Hutchison, Nov. 24, 1986

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(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
S. E. Harris, Jr.	July, 1987

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Fig. 20			Nov. 24, 1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view looking west along stream in Dennison Hollow	35 mm. C

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Fig. 21			Nov. 24, 1986	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of stony flood plain in Dennison Hollow	35 mm. C

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Figure 20. View looking west along stream in Dennison Hollow; at this point, there is almost no flood plain
- photo by S. E. Harris, Jr., Nov. 24, 1986

Figure 21. View of stony flood plain along stream in west part of Dennison Hollow; note evidence of boulder movement downstream during heavy rains
- photo by S. E. Harris, Jr., Nov. 24, 1986

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Fig. 22				July 2, 1987	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of sandstone glade at Dennison Hollow	35 mm. C

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Fig. 23				July 2, 1987	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of sandstone glade at Dennison Hollow showing downslope movement	35 mm. C

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Figure 22. View of sandstone glade at west end of Dennison Hollow looking upslope; the common grass is Indian grass (Sorghastrum nutans); the shrubs are farkleberry (Vaccinium arboreum) and winged elm (Ulmus alata)
- photo by M. Hutchison, July 2, 1987

Figure 23. View of sandstone glade at west end of Dennison Hollow showing downslope movement of silt, gravels, and boulders from sheetwash
- photo by M. Hutchison, July 2, 1987

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PHOTOGRAPHER	DATE SUBMITTED
M. D. Hutchison	July, 1987
HEADQUARTERS UNIT	LOCATION

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Fig. 24			July 2, 1987	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of xeric forest at Dennison Hollow	35 mm. C

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1600-1 (8 67)

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PHOTOGRAPHIC RECORD

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TEMP. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
Fig. 25			July 2, 1987	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of barrens community at Dennison Hollow	35 mm. C

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1600-1 (8/67)

Figure 24. View of xeric forest on south-facing slope near west end of Dennison Hollow; note shrubby character of blackjack oaks (Quercus marilandica) and black oaks (Quercus velutina) - photo by M. Hutchison, July 2, 1987

Figure 25. View of barrens community on upper slope near west end of Dennison Hollow; tree in foreground is an old post oak (Quercus stellata); the groundcover is Indian grass (Sorghastrum nutans)
- photo by M. Hutchison, July 2, 1987

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
M. D. Hutchison	July, 1987
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TEMP. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
Fig. 26			July 2, 1987	Illinois, Shawnee National Forest, Elizabeth-town Dist., Saline Co.	view of butterfly pea (Clitoria mariana) at Dennison Hollow	35 mm. C

☆ U.S. GOVERNMENT PRINTING OFFICE : 1973—730-157/208 3-1

1600-1 (8/67)

Figure 26. Butterfly pea (Clitoria mariana), a plant common in and characteristic of the barrens and xeric forests at Dennison Hollow
- photo by M. Hutchison, July 2, 1987

Fig. 10
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 11.
Dennison Hollow
RNA
Saline Co., Ill.

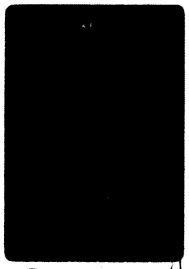

Fig. 12. Dennison Hollow RNA
Saline Co., Ill.

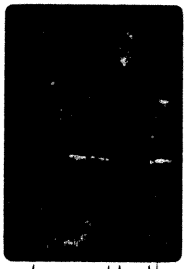

Fig. 13.
Dennison Hollow RNA
Saline Co., Ill.

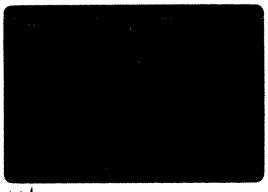

Fig. 14.
Dennison Hollow RNA
Saline Co., Ill.

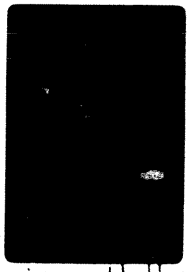

Fig. 15
Dennison Hollow
Saline Co., Ill.

Fig. 16
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 17
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 18
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 19
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 20
Dennison Hollow
RNA
Saline Co., Ill.

Fig. 21
Dennison Hollow
RNA
Saline Co., Ill.

12

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Dennison Hollow Research Natural Area

Shawnee National Forest

Saline County, Illinois

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met in arriving at this recommendation.

Prepared by Max D. Hutchison, Field Representative, Natural Land Institute; Steven Olson, Technical Assistant, Natural Land Institute; and Stanley Harris, Jr., Ph.D., Professor Emeritus, Department of Geology, Southern Illinois University

Recommended by _____ Date 3/31/88
Gary Sieren, District Ranger,
Elizabethtown District

Recommended by _____ Date 4/13/88
Kenneth Henderson, Forest Supervisor,
Shawnee National Forest

Recommended by _____ Date 9/22/88
Floyd Marita, Regional Forester,
Eastern Region

Recommended by _____ Date 10/7/88
Ronald D. Lindmark, Station Director,
North Central Station

TITLE PAGE

Establishment Record for the Dennison Hollow Research Natural Area within the Shawnee National Forest, Saline County, Illinois

ESTABLISHMENT RECORD FOR THE DENNISON HOLLOW RESEARCH NATURAL AREA WITHIN THE SHAWNEE NATIONAL FOREST SALINE COUNTY, ILLINOIS

INTRODUCTION

The Dennison Hollow Research Natural Area (RNA) is a 205-acre (83.0-hectare) tract owned by the federal government and managed by the U. S. Forest Service, Shawnee National Forest (Figure 4). It contains relatively undisturbed natural community types, i.e. xeric upland forest, dry upland forest, dry-mesic upland forest, barrens, sandstone glade, and sandstone cliff.

There are three Shawnee National Forest Listed Species known to occur at Dennison Hollow: the loggerhead shrike (*Lanius ludovicianus*), the chestnut oak (*Quercus prinus*), and an aster (*Aster undulatus*) (Shawnee National Forest, Land and Resource Management Plan, 1986). The shrike is listed as Threatened in Illinois. The aster and chestnut oak are also listed as Threatened in the State (Natural Land Institute, 1981).

The Dennison Hollow RNA is geologically significant. It is on the back slope of a ridge along a fault-line scarp where there has been a great amount of displacement. It is a valley at the west end of the Eagle Creek Syncline with a stream flowing eastward, in the direction of the 15° dip of the bedrock. This dip is steep for Illinois, so steep that there are only narrow outcrops of each of the alternating resistant sandstones and shale units that make up the bedrock (Figures 5 and 6).

Five Society of American Foresters (SAF) cover types are present: Type 40 (post oak-blackjack oak), Type 44 (Chestnut oak), Type 52 (white oak-black oak-northern red oak), Type 53 (white oak), and Type 110 (black oak). Types 40 and 53 are indicated as needed in the RNA system (Shawnee National Forest, Land and Resource Management Plan, 1986). Several variants and small stands with other dominants are also present.

The RNA boundaries closely follow those of the Dennison Hollow Natural Area identified by the Illinois Natural Areas Inventory (1978) as being of significance because of its very high quality dry upland forest, sandstone glade, and sandstone cliff communities; its high quality dry-mesic upland forest community; a State Threatened plant species, the chestnut oak (*Quercus prinus*); and an archaeological feature, an ancient stone ring (INAI, 1978; see Appendix I). (A tract at the east end of the INAI area has a well-developed shale glade. It is not included in the RNA boundary, because it is private property.)

Dennison Hollow is a valley on the upthrown (east) side of the Shawneetown Fault. It is on the east side (the back slope) of the high ridge that rises abruptly from the flat Pleistocene lake plain. Drainage is east into Rose Creek, a tributary of Eagle Creek which flows into the Saline River. The Saline River enters the Ohio River at the northeast corner of Hardin County. Bedrock is Pennsylvanian sandstones and shales. The RNA is a part of the Greater Shawnee Hills Section of the Shawnee Hills Natural Division and is within the Interior Low Plateaus Physiographic Province (Schwegman, 1973).

The Public Land Survey surveyors describing this region in 1807 noted the "hills, quarries of stone, and rocky bluffs." The trees they mention include the post oak, white oak, and blackjack oak. Comments recorded during the Rolfe topographical survey of Illinois in 1890-92 describe the region as follows:

> "Many prominent hills and divides are found in this township. The valleys are mostly deep, have very steep and prominent bluffs of hard sandstone and rocks . . . All along the valleys and sides of these hills the country is covered with rocks of sandstone making it almost impossible for cultivation."

The Dennison Hollow RNA was in private ownership prior to its acquisition by the federal government to become a part of the Shawnee National Forest. Four tracts were purchased during the period 1935-1941; one was acquired in 1984 (Figure 4). Most of the RNA has never been cultivated or significantly disturbed by livestock. There are a few small sites on the upland at the north edge of the RNA that were parts of agricultural fields prior to 1937. These are included for buffer and have now mostly reverted to forest. There has been some selective logging in most of the area but none of significance in recent years. Due to the rugged terrain and thin rocky soils, the area has never been suitable for agricultural use. Trees grow slowly and are of poor form and quality for lumber over most of the area.

Although parts of the area are scenic, access is not easy, and the area has received very little public use. An occasional hunter enters the hollow and walks the valley bottom.

In 1971-73, Dennison Hollow was recognized by botanists at Southern Illinois University, Carbondale, Illinois, as being significant because of its old growth stands of chestnut oak (Quercus prinus), a species rare in Illinois and near the western edge of its range. During the Illinois Natural Areas Inventory of 1976-78, the area was identified as being of state-wide significance for its very high quality forest and glade communities. The Dennison Hollow

area was recommended for designation as a research natural area in a report on protection and management of National Forest natural areas prepared and submitted by the Illinois Department of Conservation (West, 1980). In that report, Dennison Hollow is a part of a larger area referred to as the Mountain Township Forests Natural Area. The area was recommended for RNA designation by the North Central Forest Experiment Station in 1981 (Rink, 1981).

LAND MANAGEMENT PLANNING

The Dennison Hollow natural area is recommended for designation as a research natural area in the Land and Resource Management Plan, Shawnee National Forest, approved November 24, 1986 (see SNF, Forest Plan, IV-3, Special Feature Management). The environmental analysis as a part of the planning process supports the recommendation to establish the RNA (SNF, Final EIS, 2-66, Identification and Management of Special Features). It is currently being protected under Management Prescription 8.2.

OBJECTIVES

The objectives of establishing the Dennison Hollow Research Natural Area are to:

1) preserve pristine forest, grassland, and geological natural situations for research, study, observation, monitoring, and educational activities that maintain unmodified conditions,

2) preserve and maintain genetic diversity,

3) protect against serious environmental disruptions,

4) serve as reference area for the study of succession,

5) provide onsite and extension educational activities,

6) serve as baseline area for measuring long-term ecological changes,

7) serve as control area for manipulative research,

8) monitor effects of resource management techniques and practices.

JUSTIFICATION

Natural communities of very high quality are present at the Dennison Hollow RNA. More than 45 acres (18.2 hectares) of the xeric upland forest/dry upland forest/barrens community complex are essentially undisturbed. Here, the trees are short, limby, and relatively small in diameter, primarily due to the thin drouthy soils (Figures 19 and 25). Many individuals are very old. The barrens are relatively open sites with a mixture of woody shrubs and prairie species (Figure 18). They are on very drouthy soils in this area. Prior to settlement, the barrens were more common and widespread in the Midwest. Today, it is difficult to separate the barrens from the xeric forest and glade communities on a map, but excellent examples of each are present at this RNA. High quality upland forests are rare in the Midwest. The barrens is extremely rare and is given a rank of G1S1 by The Nature Conservancy (this means that the barrens natural community is critically imperiled, both in Illinois and globally).

The sandstone glade community is well-developed and essentially undisturbed at Dennison Hollow. The largest glade sites, with wide exposed expanses of bedrock, are at the west end near the head of the valley (Figure 22). The glade sites illustrate the extreme case of unconcentrated sheetwash, a significant natural process of erosion in this region (Figure 23).

The chestnut oak (Quercus prinus), a Shawnee National Forest Listed Species, occurs here in nearly pure stands (Figure 12 and 17. The rocky slopes where it grows are essentially undisturbed, and there are very old trees. This is a species near the western edge of its continental range in Illinois, and it is listed as Threatened in the State (Natural Land Institute, 1981).

An aster (Aster undulatus), a Shawnee National Forest Listed Species and an Illinois Threatened Species, occurs in the RNA.

The loggerhead shrike (Lanius ludovicianus) occurs in the area. This is a Shawnee National Forest Listed Species. It is also listed as Threatened in Illinois.

The large ridge on which Dennison Hollow is located is significant for its geomorphic features. It is a prominent escarpment along a fault line at the west end of the Eagle Creek Syncline. Dennison Hollow is a valley on the back slope of this hill. It complements the other two RNA's located on the same ridge (Cave Hill and Stoneface) in that it illustrates features not well represented at the other sites. It is one of the larger, better developed valleys on the ridge, and it has more tributaries than those in the RNA's nearby. The valley is also deeper, and there is a

greater diversity of slope and cliff aspects. Stoneface and a major part of Cave Hill are on the ridge crest and along its west slope, including sections of the cliffed upthrown escarpment face. Dennison Hollow is on the more gently sloping side, its valley paralleling the direction of the bedrock dip. This area is an outstanding site to illustrate the contrast due to north versus south slope orientation in erosion, soil thickness, and vegetation (Figure 11).

The Dennison Hollow RNA includes SAF types 40 and 53 that are listed as needed in the RNA system (Shawnee National Forest, Appendix E, Final Environmental Impact Statement, Land and Resource Management Plan, 1986). There is a diversity of natural community types and species present that add to the value of the area for research purposes.

Dennison Hollow is a valley that has cut deep into the bedrock exposing sandstones and shales of Pennsylvanian formations. It is characterized by thin drouthy soils. There are assemblages of plant species in the glades, barrens, and xeric forests that are usually considered to be more characteristic of the prairies further to the north and west.

This area is suitable for research, demonstration, and/or learning experience opportunities. Conditions are ideal for research on prairie-forest successional and interface questions, for studies of rock weathering and pedalogical research dependent upon the presettlement quality of the site, and for studies of vegetational history and geography of plant species migrations.

PRINCIPAL DISTINGUISHING FEATURES

The Dennison Hollow Research Natural Area is a part of a high ridge along a prominent fault-line escarpment that rises some 520 feet (158.5 meters) above the surrounding Pleistocene lake plain. It is on the back slope of the cuesta. The Pennsylvanian bedrock of alternating resistant sandstones and shales dips easterly at an angle of 15°. Such a dip is uncommon in Illinois, even in the faulted region of southern Illinois. The dip is so steep that each rock unit has only a narrow outcrop before plunging underground. The valleys are generally V-shaped with channels occupying the entire valley in the sandstone outcrop (Figure 20). In the shale outcrops, the valleys open out. Sandstone of the overlying units forms cliffed scarps along the tributaries and can be followed downdip along the main valley. Elevation within the RNA ranges from 420 feet (128.0 meters) to 920 feet (280.4 meters) above mean sea level.

Almost all of the RNA is forested with a diversity of plant species and community types (Figure 11). Relatively small open glades occur where solid pavements of sandstone are exposed (Figure 22). There are small rock ledges and cliffs along the stream (Figure 17). The barrens, xeric upland forest, and dry upland forest communities are characterized by thin drouthy soils and an open to thin canopy of small limby trees and shrubby thickets (Figures 18 and 24). On the north-facing lower slopes and in the deep valley, there are more mesic sites with deeper soils and larger trees. The glades and barrens have good assemblages of prairie plants (Figure 18). The drouthy sites on steep rocky slopes are of high natural quality and reflect little unnatural disturbance.

The dry and xeric forests are dominated by post oak (Quercus stellata), blackjack oak (Q. marilandica), black oak (Q. velutina), white oak (Q. alba), elms (Ulmus spp.), and hickories (Carya glabra and C. ovalis). Local sites are dominated by nearly pure stands of chestnut oak (Q. prinus). Common shrubs are farkleberry (Vaccinium arboreum) and shadbush (Amelanchier arborea). The dry-mesic stands have white oak, red oak, and hickories. The sandstone glades and barrens have thickets of farkleberry and blackjack oak with clumpy patches of Indian grass (Sorghastrum nutans) and poverty oats grass (Danthonia spicata). There are many ferns on the north-facing cliffs bordering the main stream.

The chestnut oak stands are of very high natural quality, and the chestnut oak is a Shawnee National Forest Listed Species. It is also listed as Threatened in Illinois. An aster (Aster undulatus) occurs here that is a Shawnee National Forest Listed Species and an Illinois Threatened Species. There are records of the loggerhead shrike (Lanius ludovicianus) in the RNA. This is also a Shawnee National Forest Listed Species and an Illinois Threatened Species.

LOCATION

The Dennison Hollow Research Natural Area is on the Elizabethtown Ranger District of the Shawnee National Forest. It is in Saline County, in the extreme southeastern tip of Illinois. Latitude is 37° 39' N, and longitude is 88° 25' W. The area is in sections 15 and 16, T. 10 S., R. 7 E. of the 3rd P. M. (Figures 3 and 4).

The RNA boundaries are described as follows:

> **Beginning at a point on the section line to sections 15 and 16 and being 22 chains south of the northeast corner of section 16, thence;**

S 40° E 16 chains, East 3 chains, North 3 chains, N 45° E 2 chains, S 80° E 6 chains, North 5 chains, S 80° E 5 chains, North 3 chains and northeasterly to a point on the north-south centerline of section 15 and being 3 chains north of the center north sixteenth corner of section 15, thence;

South 3 chains to center north sixteenth corner of section 15, thence;

East on north sixteenth line to northeast sixteenth corner of section 15, thence;

South on east sixteenth line of section 15, a distance of 15 chains to a point, thence;

N 85° W 8 chains and westerly about 11 chains to a point on north-south centerline of section 15 at 5 chains north of center quarter corner, thence;

S 72° W about 15 chains to a point on the east west centerline of section 15, thence;

S 29° W 18 chains and N 73° W 5 chains crossing intermittent stream, thence;

North and northwest around point of ridge along 600 foot contour a distance of 7 chains, thence;

Westerly about 12 chains to a point on the west line of section 15 and 10 chains south of the quarter corner to sections 15-16, thence;

Continuing westerly in section 16, a distance of 12 chains to a point, thence;

S 66° W 16 chains and southerly about 4 chains to a point on the south sixteenth line of section 16 being 13 chains east of the center south sixteenth corner of section 16, thence;

West on south sixteenth line 10 chains to a point, thence;

N 7° E to a point on the east-west centerline of section 16, thence;

N 38° E 27 chains to a point near crest of ridge, thence;

Southeasterly to point of beginning containing approximately 205 acres (83.0 hectares)

Thence, running S., 88° W., an approximate distance of 12 chains to a point on the west line of section 15, 30 chains north of the southwest corner of section 15;

Thence, continuing S., 88° W., a distance of 12 chains to a point;

Thence, running S., 66° W., a distance of 16 chains to a point;

Thence, running S., an approximate distance of 4 chains to a point on the south line of the NW 1/4 of the SE 1/4 of section 16, 13 chains east of the southwest corner of said quarter quarter section;

Thence, running west along the south line of the NW 1/4 of the SE 1/4 of section 16, an approximate distance of 10 chains to the point of beginning, containing in all, 205 acres (83.0 hectares).

Elevation ranges from 920 feet (280.4 meters) above mean sea level at the west edge of the area to 420 feet (128.0 meters) above mean sea level at the east edge where the stream leaves the RNA.

The area is about 9 miles (14.5 kilometers) east-southeast of Harrisburg, the county seat of Saline County. It is about 2 3/4 miles (4.4 kilometers) east-northeast of the village of Rudement. Access to the RNA is from Illinois Route 34, north from Herod, on Saline County Roads 307 and 338. County Road 271 turns west from 338 on the line between sections 11 and 14, just north of the nearly abandoned village site of Eagle. County Road 271 is passable to vehicles for about a mile (1.6 kilometers) where one may park and walk west, one-fourth mile (.4 kilometers), to the east boundary of the RNA (Figures 3 and 4).

AREA BY COVER TYPES

The Dennison Hollow Research Natural Area is nearly all forested. The following are SAF and Kuchler cover types represented within the RNA (Figure 8):

SAF Cover Type	Kuchler PNV Type	Acres	Hectares
#40 post oak-blackjack oak	#91 oak-hickory	52	21.1
#44 chestnut oak	#91 oak-hickory	15	6.1
#52 white oak-black oak-northern red oak	#91 oak-hickory	50	20.2
#53 white oak	#91 oak-hickory	46	18.6
#110 black oak	#91 oak-hickory	42	17.0

According to the Illinois Natural Areas Inventory (1978) data for the Dennison Hollow Natural Area, the following types (that clearly occur within the RNA) were described:

Natural Community	Plant Community
Dry upland forest	Post oak - black oak
Dry-mesic upland forest	white oak - red oak
Sandstone glade	post oak - redcedar - broomsedge
Sandstone cliff community	----

The following natural community types are recognized and mapped by the authors of this report (see descriptions under Flora):

dry-mesic upland forest
dry upland forest
xeric upland forest
barrens
sandstone glade
cliff

PHYSICAL AND CLIMATIC CONDITIONS

The climatological data are from the collection station at Harrisburg. The period of record is 1931-60. Harrisburg is 9 miles (14.5 kilometers) west-northwest of the Dennison Hollow Research Natural Area. The following description is copied from the Soil Survey of Saline County, Illinois (1978):

> The Saline County area has the continental climate typical of southern Illinois. The annual temperature range is about 100 degrees F. Summer maximums reach 100 F. (37.8° C.) or more during 8 out of 10 summers. Winter minimums are zero (-17.8° C.) or below during 6 out of 10 winters.
>
> Low pressure areas and their associated weather fronts bring frequent changes in temperature, humidity, cloudiness, and wind direction much of the year.
>
> Annual precipitation averages about 42 inches (106.7 centimeters) and ranges from about 25 to 72 inches (64 to 183 centimeters). Precipitation is fairly evenly distributed throughout the year. September and October are the driest months. Prolonged dry spells during the growing season are not unusual. Summer precipitation occurs mostly in short showers or thunderstorms which are occasionally accompanied by hail and damaging winds. More than 7 inches (17.8 centimeters) of rain has fallen in a 24-hour period. Only light snows occur during an average winter. The average annual snowfall is about 12 inches (30.5 centimeters), and only rarely does a winter have as much as 20 inches (50.8 centimeters).
>
> Summers are warm, and continuous warm periods can be prolonged. July is the warmest month; the average daily maximum temperature is near 90° F. for both July and August. The highest recorded temperature is 113° F. (45° C.). January is the coldest month, and both January and February have had temperatures as low as -20° F. (-28.9° C.).
>
> The number of days between the average date of the last freezing temperature in spring and the average date of the first freezing temperature in fall is about 185 days. Temperatures vary consistently between ridge and valley locations during radiation freezes, the most common type of freeze in Illinois.

The Dennison Hollow RNA is on the north slope of the Shawnee Hills ridge that extends east-west across the southern tip of Illinois, and drainage is to the east, by means of Rose Creek and Eagle Creek, into the Saline River (Figures 1 and 4). Dennison Hollow is on the east side of a high ridge that is along a fault-line scarp where the rocks

are dipping approximately 15° toward the east and southeast. It is on the upthrown (southeast) side of the Shawneetown Fault. The sandstone cap, dipping easterly, forms cliffs up to 80 feet (24.4 meters) or more in height beneath the highest ridge along the west and northwest sides of the hill to the north and west of the Dennison Hollow RNA (Figure 5). The more gentle back slope, where Dennison Hollow is located, is dissected by evenly spaced parallel valleys, which are V-shaped and have very narrow floodplains.

The area is almost all forested. There are open glades with exposed rock and thin soils. Conditions are drouthy, especially on south-facing slopes where evaporation is high in summer. Some of the barrens have small openings in the forest canopy (Figures 22 and 25). In many places the slopes have a thin cover of trees with individuals that are often stunted and partly dead. The overstory trees are limby and short, and shrubs and vines form thickets (Figure 24). Openings have clumpy grasses and forbs characteristic of dry woods in the Shawnee Hills region. Along the north-facing slopes and in the more mesic valleys where there is a thicker accumulation of sediment, there are larger taller trees with a relatively dense canopy. In lower reaches of the hollow, the valley floor widens, and several feet of sediment are present.

DESCRIPTION OF VALUES

Flora

The following natural community types are mapped by the authors of this report as occurring within the Dennison Hollow Research Natural Area: barrens, xeric upland forest, dry upland forest, dry-mesic upland forest, sandstone glade, and cliff (Figure 9). The sandstone glade and cliff communities are so narrow and/or small in area, they are not separated as distinct SAF or Kuchler cover types. The barrens, xeric upland forest, and dry upland forest communities are difficult to separate as distinct entities because of the overlap in woody species composition between them. It is mainly the degree of drouthiness that influences structural differences, i.e. the sizes and shapes of trees, the density of stands, and the amount of groundcover. Typical examples of each of the natural communities mapped are found within the RNA boundaries.

The barrens and xeric forest communities are both dominated by oaks and hickories, the principal difference being the incomplete canopy and the grass dominated groundcover of the barrens (except at the chestnut oak barrens sites, where there is little groundcover). Blackjack oak (*Quercus marilandica*) is common throughout, but locally, other species make up most of the canopy. Chestnut oak (*Q. prinus*) occurs in nearly pure stands on some of the rocky south-facing slopes. Here, the trees are relatively small (most less than 16 inches in diameter), and they are commonly leaning or crooked (Figure 14). There is little understory or groundcover in the chestnut oak stands, and even the leaf litter is often swept away by the wind at these sites. Mosses and lichens are common and characteristic here. Poverty oats (*Danthonia spicata*) is a common but inconspicuous grass. Chestnut oak often grades into white oak (*Q. alba*) along the middle and lower slopes and into stands dominated by black oak (*Q. velutina*) and blackjack oak on the ridge crests and upper slopes (Figure 19). Post oaks (*Q. stellata*) and blackjack oaks are dominant on the rocky south-facing slopes in the west half of the area. Here, the trees are small,most less than 12 inches (30.5 centimeters) in diameter, limby, and short (Figure 24.). Post oaks are commonly hollow or partly dead (Figure 25). The understory is dense in places with farkleberry (*Vaccinium arboreum*) thickets. Greenbrier (*Smilax bona-nox*) forms tangles in the shrubs and saplings. The xeric forest sites have a canopy cover of 70% to 90%. The barrens are usually more open, often with less than 50% canopy cover. There is more groundcover vegetation in the barrens openings in the post oak-blackjack oak stands than in the chestnut oak sites (Figures 18 and 25). Woodland sunflower (*Helianthus divaricatus*), butterfly pea (*Clitoria mariana*), pussytoes (*Antennaria plantaginifolia*), and

dittany (Cunila origanoides) are indicator herbs of the drier sites. Barrens openings commonly have little bluestem (Andropogon scoparius) and Indian grass (Sorghastrum nutans).

The dry upland forest sites are primarily on the upper, gentler slopes and ridge tops along the north side of the valley. They are not easy to separate from the xeric forest sites, as the soil depths and drouthy conditions vary from one ridge to another, but generally, the dry forests have slightly larger trees. White oak is locally common, but black oak and pignut hickory (Carya glabra) are widespread dominants. Elms (Ulmus spp.) are also abundant. Poison ivy (Rhus radicans) is very common in the dry forests.

The dry-mesic upland forest community occurs primarily on the more mesic north-facing slopes along the south side of the valley. Here, the trees are relatively tall and larger than those in the stands on drier sites. The dominants are red oak (Q. rubra) and white oak, but hickories and maples (Acer saccharum and A. rubrum) are also common. Chestnut oaks occur on the lower slopes in the east half of the RNA. Beech (Fagus grandifolia) is occasional but not common. Flowering dogwood (Cornus florida) is common in the understory, and poison ivy and Virginia creeper (Parthenocissus quinquefolia) are locally abundant.

The sandstone glades are mostly exposed bedrock on the lower east-facing slopes at the west end of the RNA. Here, in most places, the massive outcrops are on fairly steep slopes. There is a lot of sheetwash from the wooded slopes above, and there is a lot of downslope movement of gravels, silts, and even boulders during rains (Figure 23). In places, the rocks are covered with lichens (Parmelia spp.) and mosses (Polytrichum spp.). Vascular plants occur in crevices, on small ledges, and in pockets of soil collected from sheetwash upslope. Stunted winged elms (Ulmus alata) and redcedar (Juniperus virginiana) are common, and farkleberry forms thickets with tangles of greenbrier. Pineweed (Hypericum gentianoides), the little Crotonopsis elliptica, and rough buttonweed (Diodia teres) are abundant forbs. Poverty oats is a common grass, but Indian grass is a dominant, growing densely in the crevices and in pockets of soil (Figure 22).

The cliffs occur mostly on the valley slopes in the east half of the RNA (Figure 19). There are small overhangs in a few places. Woody shrubs and poverty oat grass grow in crevices, and ferns of several species, especially Christmas fern (Polystichum acrostichoides), are locally abundant on the north-facing bluffs. Hydrangea (Hydrangea arborescens) and alumroot (Heuchera parviflora) are also characteristic species of the moist rocky cliffs.

The chestnut oak and an aster (Aster undulatus), both Shawnee National Forest Listed Species, occur here at Dennison Hollow. They are also listed as Threatened in Illinois.

Fauna

No Federally Endangered or Threatened animal species are currently known to be resident at Dennison Hollow. Bald eagles (Haliaeetus leucocephalus) and peregrine falcons (Falco peregrinus) pass through the area in migration.

The loggerhead shrike (Lanius ludovicianus), a Shawnee National Forest Listed Species, is reported as occurring in the RNA. Several Shawnee National Forest Listed Species occur in the general area, including the red-shouldered hawk (Buteo lineatus) and Cooper's hawk (Accipiter cooperii). Enough habitat exists in the vicinity for breeding of these species. Bewick's wren (Thryomanes bewickii) may also occur. Common birds are the pileated woodpecker (Dryocopus pileatus), eastern wood-pewee (Contopus virens), and blue-gray gnatcatcher (Polioptila caerulea). One of the largest flocks of wild turkeys (Meleagris gallopavo) in Illinois occurs in the Dennison Hollow area.

The timber rattlesnake (Crotalis horridus) and the copperhead (Agkistrodon contortrix) are occasional along the bluffs in the RNA. The eastern box turtle (Terrapene carolina), the fence lizard (Sceloporus undulatus), and the American toad (Bufo americanus) are common throughout the area.

Most of the animals common to the region probably occur in, or occasionally use, the RNA, especially the larger mammals such as the white-tailed deer (Odocoileus virginianus), coyote (Canis latrans), gray fox (Urocyon cinereoargenteus), raccoon (Procyon lotor), opossum (Didelphis marsupialis), and gray squirrel (Sciurus carolinensis).

Geology (Figures 5 and 6)

A relatively thin layer of silty loess covers the area. This is due to a lesser original thickness of deposition and more than average erosion since deposition because of the steep slopes. It is generally thickest high on the ridge crests, becoming thinner downslope.

The large ridge on which Dennison Hollow is located is composed of 1) massive sandstone, some conglomeritic, 2) sandstone with alternating shale layers on the ridge crest and back slope, and 3) shale and limestone on the scarp face.

The Caseyville Sandstone and associated shale of the Pennsylvanian System occupies the headwater region of the RNA, while Abbott and Spoon shales and sandstones crop out in the lower part of the "dip slope." Massive beds of Caseyville Sandstone, up to six feet (1.83 meters) thick, commonly crossbedded and with ripple-marked surfaces, are characteristic (Figure 22).

The Abbott and Spoon formations are composed of alternating shale and sandstone units. These sandstones are not as coarse textured as those of the Caseyville, and they are not as resistant. Nevertheless, they form conspicuous ledges on the steep valley sides of the hollow and its tributaries (Figure 19).

The complex Shawneetown Fault system is responsible for the high escarpment ridge. This ridge rises abruptly from the flat Pleistocene lake plain whose sediments overlie the coal-bearing portion of Pennsylvanian strata. Great thicknesses of Pennsylvanian sediments have been eroded from both sides of the fault zone. However, the resistant Caseyville Sandstone "holds up" the hill, whereas on the north and west sides, the same formations are deeply buried. There is no evidence to indicate movement along the Shawneetown Fault in Recent Time.

The effect of erosion by running water is well displayed in a variety of forms (Figure 21). Of considerable interest is the fact that there is no evidence of severe logging, significant land clearing, or cultivation in the RNA. Thus, the very thin soils on the slopes cannot be blamed on unnatural disturbances.

The RNA is primarily a valley that has been eroded by the geomorphic processes characteristic of humid temperate climates. The headwater segment of Dennison Hollow follows a strike course exposing sandstones in both scarp and dipslope orientation. This is repeated in several tributaries and even, on a small scale, in some small waterways.

The V-shaped valley has steep slopes, commonly with sandstone cliffs and ledges descending eastward to the valley floor. At that position, falls and/or cataracts occur. The valley then widens out in the shale outcrop, and a tributary enters. The eastern valley slope of the tributary has a high sandstone cliff and the pattern repeats.

Stream channels are choked with sandstone blocks and boulders. Imbricate arrangement of flat blocks indicates recent movement by high storm water (Figure 21). Blocks six feet (1.8 meters) square and one foot (.3 meters) thick show this arrangement. The channel is commonly split (in the shale outcrop) by accumulations of a pile of these rocks.

Large trees, including sweetgum (Liquidambar styraciflua) and maple, occupy such elongate "islands."

Some boulders in the channel have no moss accumulation. Others have moss only on the protected downstream sides -- bedloads of the storm waters having scraped away the exposed growth.

Some valley slopes are covered by large sandstone blocks and many loose boulders; they probably rest on shaly bedrock which favors downslope mass movement. No landslides were seen however.

References: W. J. Nelson and D. K. Lumm. 1986. Geologic map of the Rudement Quadrangle, Saline County, Illinois. Illinois State Geological Survey, Map EGQ-3. Map plus explanation and discussion.

S. E. Harris, Jr., C. W. Horrell, and D. Irwin. 1977. Exploring the land and rocks of southern Illinois, a geological guide. Southern Illinois University Press, Carbondale. 240 pages.

Soils (Figure 7)

Soils are derived primarily from the loess cover. Loess is thicker on the ridge crests where a soil profile is moderately well-developed. It is also thicker on north-facing slopes, a characteristic throughout the Shawnee National Forest where slopes are steep. On the south-facing slopes where the loess is very thin, some sand from the underlying bedrock is incorporated with the loessal silt. It is mainly on the drouthy, south-facing, upper slopes where the dry and xeric vegetation is found. Rainwash and frequent repetitions of freeze-thaw are dominant processes. The hazard of erosion is very severe.

A gray organic-rich A' horizon marks the soils of the valley bottom at Dennison Hollow. This suggests that this area has not been cultivated nor seriously disturbed.

The Burnside silt loam (427) occurs as a narrow band along the valley bottom in the east half of the RNA. It formed in silty stream sediments and in the underlying channery or flaggy loam sediments. This site is susceptible to flash flooding and stream cutting. It is strongly acid.

The Berks-Wellston complex (986G) is mapped on the upper slopes along the north side of the valley. It includes the sandstone glade area. These are very steep and drouthy soils. Areas of surface stones, boulders, and rock outcrops are common. They formed in loam weathered from sandstone, siltstone, and some shale, and are strongly acid. Berks soil makes up the major part of this complex,

especially on south-facing slopes. Berks soil has less clay than Wellston soil.

The Wellston-Berks complex (986F) is mapped on slopes that are slightly less steep than where the Berks-Wellston complex occurs. This is the soil complex that covers the valley and major part of the RNA. Here, the Wellston soil makes up 50 to 70 percent of the unit.

The Zanesville silt loam (340) is mapped on upper slopes where there are fewer stones and rock outcrops. It formed in loess and material weathered from sandstone, siltstone, and shale. It is mainly loam with some stones, is medium acid in reaction, and has a fragipan.

The Hosmer silt loam (214) occurs as very narrow bands along the ridge crests in the area. It formed in loess, has a fragipan, and is usually strongly acid.

Reference: C. Miles and B. Weiss. 1978. Soil survey of Saline County, Illinois. Soil Conservation Service and Forest Service, in cooperation with the Illinois Agricultural Experiment Station, Urbana, Illinois. 94 pages plus maps.

Lands

All of the RNA is federal land acquired by the U. S. Forest Service as a part of the Shawnee National Forest. Four tracts were purchased during the period 1935-1941. These have no outstanding rights. There are outstanding mineral rights for an unlimited period of time on 54 acres (21.9 hectares) within the RNA boundaries, that part within the S 1/2 of the NE 1/4 of section 16, a tract that was acquired in 1984. According to Appendix E of the Shawnee National Forest, Final Environmental Impact Statement, Land and Resource Management Plan (1986), there is medium potential for the presence of fluorite, lead, zinc, and coal, and low potential for the presence of oil and gas.

Cultural features

There are no known historical sites or cemeteries within the RNA. There is a very old ring of stones on the lower slope near the east end of the RNA that has been reported as being an Indian feature (see Appendix I).

IMPACTS AND POSSIBLE CONFLICTS

The Shawnee National Forest's Land and Resource Management Plan (1986) contains standards and guidelines for the management and protection of special areas, including the proposed research natural areas. These standards and guidelines provide the basis for conflict resolution .

Mineral resources

Mineral rights are outstanding on 54 acres (21.9 hectares) of the 205-acre (83.0-hectare) Dennison Hollow RNA. This tract is that part of the RNA within the S 1/2 of the NE 1/4 of section 16. According to Appendix E of the Shawnee National Forest, Final Environmental Impact Statement, Land and Resource Management Plan (1986), there is medium potential for the presence of fluorite, lead, zinc, and coal, and low potential for the presence of oil and gas.

Coal is currently being mined in the Dennison Hollow vicinity, just to the east of the RNA, but because of the stratigraphy and steep dip of the rocks in the region, it is doubtful that mineable deposits are present within the RNA boundaries.

Grazing

This area is not under any range allotment and is unsuitable for livestock grazing. It is nearly all forested. There is no known interest in developing this area for livestock. The soils on the steep rocky slopes are subject to extreme erosion, and livestock use would have undesirable effects on the soils, natural plant communities, and rare species in the area.

Timber

All of the potential research natural areas identified in the Shawnee National Forest Land and Resource Management Plan (1986) were considered inappropriate for timber production. These lands were not included in the Shawnee National Forest timber base. Consequently, no additional withdrawals will be required.

Watershed values

The protection and management of Dennison Hollow as an RNA will maintain the minimal erosional condition of the watershed, and thus help protect the water quality of the recipient streams and rivers. Protection of the natural vegetative cover in the area may be an important factor in maintaining the unpolluted character and cool waters of the tributary streams of the Saline River, specifically Rose Creek and Eagle Creek. High water quality is important for the protection of rare plants and animals which may be directly associated with the beds of these streams downstream from the RNA.

Recreational values

The chief recreational use is by hunters during hunting season. They have little impact, and this use would not

detract from RNA designation. There is evidence of infrequent hiking along the stream, and camp fires have been built under a rock shelter at one place. Off road vehicle riders use trails very near the east end, and may occasionally enter the RNA. There are no special attractions to cause public use to increase significantly. Adequate supervision and management should prevent serious recreational use from developing.

Wildlife and plant values

Management of the area as an RNA will help to preserve habitats for all wildlife and plant species native to the site.

Some maintenance is required to control exotics and keep woody invasion from eliminating some of the barrens and glade communities, but such should not cause any significant impact or result in any conflict with other uses in the vicinity.

Wilderness, Wild and Scenic River, or National Recreation Area values

No designated or proposed Wilderness, Wild and Scenic River, or National Recreation Area would be impacted.

Transportation plans

There are no known transportation plans that are likely to be in conflict with, or adversely affect, the RNA. There are no existing roads within the area.

MANAGEMENT PRESCRIPTION

The primary objective of the Dennison Hollow Research Natural Area management is to protect and maintain its natural character, i.e. to preserve the area from unnatural disturbance.

The purpose of management is to provide an area to illustrate and typify for research and educational purposes, some of the important forest, barrens, and glade types characteristic of the Midwest, as well as other plant communities that have special and unique characteristics of scientific interest and importance.

Vegetative management

Exotics are not a serious problem in the RNA, and none of the significant cover types or rare plant species are threatened at the present time, but removal and control of certain agressive species throughout the area, such as Japanese honeysuckle (*Lonicera japonica*), is desirable.

Pine (non native species) seedlings are scattered in a few of the barrens and xeric forest sites that have an open canopy. These are exotics that have spread from plantations nearby, and they will be removed or adequately controlled.

Prescribed burning and hand removal of trees and shrubs are permitted to help control the invasion of woody vegetation into the naturally open areas, i.e. the glades and barrens. It is assumed that the tendency of natural openings in the Midwest to succeed to forest will result in the disappearance of these communities without fire or the replication of control measures that kept them open in presettlement times. Prescribed burning will not be necessary every year, and a regular schedule of vegetative management activities will be developed as results are monitored.

ADMINISTRATIVE RECORDS AND PROTECTION

The administrator and protector of the Dennison Hollow Research Natural Area is:

District Ranger
Elizabethtown District
USDA - Forest Service
Elizabethtown, Illinois 62931

The research coordinator is:

Director
North Central Forest Experiment Station
1992 Folwell Ave.
St. Paul, MN 55108

The research data file is maintained by the North Central Forest Experiment Station and the Shawnee National Forest Headquarters, Harrisburg, Illinois 62946. The Natural Heritage Division of the Illinois Department of Conservation, 524 S. 2nd Street, Springfield, Illinois 62706 also maintains a file of the natural area. Plant species collected in the area have been deposited in the herbarium at Southern Illinois University at Carbondale, Illinois 62901.

REFERENCES

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APPENDIX ITEM I

Computer printout of data collected for the Dennison Hollow Natural Area by the Illinois Natural Areas Inventory, 1976-78.

The boundaries of the INAI area are slightly different from the RNA boundaries, and the shale glade is on a privately-owned tract that is not included in the RNA.

Illinois Natural Areas Inventory
Natural Land Institute

AREA # 345

COUNTIES: 83 Saline

REFERENCE NUMBER: 14

AREA NAME: Dennison Hollow

NATURAL AREA CATAGORIES & SIGNIFICANT FEATURES:

CAT.	CODE / DESCRIPTION	
I	A1.1	Dry upland forest

EXCEPTIONAL FEATURES:

CAT.	CODE / DESCRIPTION	
I	A5.13	Sandstone glade
I	B1.2	Dry-mesic upland forest
VII	Intermittent stream	
II	172	Quercus prinus (Steep rocky slopes)
I	A5.9	Sandstone cliff community
IV	Caseyville sandstone cliff	
I	A5.12	Shale glade
VIII	Ancient stone ring	

PRESERVATION VALUE SCORE: 5

EVALUATOR: 4 Kurz

LEGAL LOCATION:

TWP	RNG	PM	SEC	QUARTER	QUARTER QUARTERS
10S	7E	3	15		A&3&5&6&11&12
10S	7E	3	16		A&9&10&15

TOPOGRAPHIC QUADRANGLES: 274b Rudement 7.5

SPECIFIC STREAM : Rose Creek

STREAM SYSTEM (Water Shed) :28 Saline River system

LEGISLATIVE DISTRICT: 59

MUNICIPALITY:- none

MINIMUM ALTITUDE: 440

MAXIMUM ALTITUDE: 900

TOPOGRAPHY:

PHYSIOGRAPHIC UNIT: 50 Shawnee Hills Section
MAJOR FEATURE: 48 Erosional hills in bedrock (medium loess)

INDIVIDUAL TOPOGRAPHIC FEATURES:
6 Ridge

114 Ravine

GEOLOGIC FORMATIONS:
216 Peoria Loess
160 Caseyville Formation
161 Abbott Formation
162 Spoon Formation

SOIL ASSOCIATION (STATE) :
18 R Grantsburg-Robbs-Wellston

SOIL ASSOCIATION (COUNTY) :
Grantsburg-Robbs

NATURAL COMMUNITY
1.1
Dry upland forest

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 1 Forest
RARITY INDEX: 3 Occasional
NATURAL QUALITY:
41.0 acres of grade A ;
Relatively undisturbed
99.0 acres of grade C ;
Mature second growth

SAF COVER TYPE: 40 Post oak--black oak

PLANT COMMUNITY:
208 Quercus stellata,post oak--
209 Quercus velutina,black oak

NATURAL COMMUNITY
1.2
Dry-mesic upland forest

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 1 Forest
RARITY INDEX: 3 Occasional
NATURAL QUALITY:
2.00 acres of grade B ;
Old second growth
13.0 acres of grade C ;
Mature second growth

SAF COVER TYPE: 53 White oak

PLANT COMMUNITY:
195 Quercus alba,white oak-
206 Quercus rubra,red oak

NATURAL COMMUNITY
5.13
Sandstone glade

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 5 Primary
RARITY INDEX: 2 Common
NATURAL QUALITY:
4.00 acres of grade A ;
Relatively undisturbed

SAF COVER TYPE: * Not collected

PLANT COMMUNITY:
208 Quercus stellata,post oak
125 Juniperus virginiana,red cedar
15 Andropogon virginicus,broomsedge

NATURAL COMMUNITY
6.7
Tree plantation

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 6 Cultural
RARITY INDEX: 0 Not collected or not applicable
NATURAL QUALITY:
18.0 acres of grade D ;
Pine plantation

SAF COVER TYPE: * Not collected

PLANT COMMUNITY:
171 Pinus taeda,loblolly pine

NATURAL COMMUNITY
6.6
Successional field

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 6 Cultural
RARITY INDEX: 0 Not collected or not applicable
NATURAL QUALITY:
20.0 acres of grade D ;
Regrowth

SAF COVER TYPE: * Not collected

PLANT COMMUNITY:

318 Diospyros virginiana,persimmon

211 Rhus copallina,winged sumac

14 Andropogon scoparius,little bluestem

NATURAL COMMUNITY
5.12
Shale glade

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 5 Primary
RARITY INDEX: 5 Very rare
NATURAL QUALITY:
Unknown acres of grade A ;
Relatively undisturbed

SAF COVER TYPE: * Not collected

PLANT COMMUNITY: * Not collected

NATURAL COMMUNITY
5.9
Sandstone cliff community

NATURAL DIVISION AND SECTION: 13a
Greater Shawnee Hills Section, Shawnee Hills Divis
COMMUNITY CLASS : 5 Primary
RARITY INDEX: 1 Abundant
NATURAL QUALITY:
Unknown acres of grade A ;
Undisturbed

SAF COVER TYPE: * Not collected

PLANT COMMUNITY: * Not collected

DIVERSITY INDEX: 5

TOTAL ACREAGE: 197

OWNERSHIP TYPE: 1 Private
2 Public

NUMBER OF OWNERSHIPS: 5

USE OF NATURAL AREA:

21 Low-intensity recreation

USE OF SURROUNDING LAND (% wildland): 90

USE OF SURROUNDING LAND (% farmland): 0

USE OF SURROUNDING LAND (% developed land): 10

NEAREST SMSA: 9 St. Louis (Madison and St. Clair counties)

DISTANCE TO SMSA: 82

NUMBER OF NEARBY SCHOOLS: 2

NEAREST SCHOOL: 87 Southeastern Illinois College, Harrisburg

NUMBER OF NEARBY D.O.C. FACILITIES: 3

MANAGEABILITY: 1

PRESERVATION STATUS:
4 Public land, not recognized as a natural area
6 Private land, not protected by owner or lessee

THREATS:
3 Threat likely within five years.
DESCRIPTION: Recreational development

SPECIES LISTS:
1 Woody plants
2 Ferns and fern allies
3 Summer birds
4 Amphibians, reptiles, and mammals
5 Other species list

SAMPLING FORMS:
1 Tree basal area
2 Tree density
3 Sapling and shrub density

DISCUSSION OF PRESERVATION VALUES:
Dennison Hollow has a very high quality upland forest with the rare chestnut oak. There are sandstone glades and cliffs and a shale glade in the area.

PUBLICATIONS:

CITATION # 946
Butts, C. 1925. Geology and mineral resources of the Equality-Shawneetown area. Ill. State Geol. Surv. Bull. 47. 76 p.

APPENDIX II.

Copy of Page 21, Shawnee National Forest, Land and Resource Management Plan, Final Environmental Impact Statement, Appendix E illustrating the role of the Dennison Hollow Research Natural Area in natural diversity

SAF Cover Type

SAF cover types in relation to RNA's

includes Dennison Hollow RNA

SAF Type	ATWOOD RIDGE	BARKER BLUFF	BURKE BRANCH	KASKASKIA	LARUE/OTTER	MTN TOWNSHIP	OZARK HILL	PANTHER HOLLOW	WHOOPIE CAT	Needed	Comments
40	X	X	X	X	X	X	X			Yes	In RNA in Kentucky, 1968 RNA Directory
44	X									Yes	Midwest example
46		X								Yes	Not in any RNA
52	X	X	X	X	X		X		X	Yes	Midwest example
53			X	X		X				Yes	Midwest example
55								X		Yes	Central Midwest example
59				X	X					No	In RNA in Indiana
60	X				X		X			No	In RNA in Indiana
63			X							Yes	Not in any RNA, Northern Example
64				X			X			Yes	Not in any RNA
65					X					Yes	Not in any RNA
75			X							Yes	Northern example
87					X					Yes	Not in any RNA

This table is from a Regional Office 4060 memo dated October 27, 1983. The memo recommends that we provide minimum coverage of all SAF cover types indicated as needed in the above table.

A 4060/1920 memo from the Regional Office dated December 22, 1983, updates the above tabl This memo places SAF cover types into three categories. One, in which there is no representative nationally; two, a category in which there is only one RNA representative; and three, a category in which there are two RNA's representing the cover type. These categories are as follows:

Not Represented	In one RNA	In two RNA's
SAF 46	SAF 40	SAF 55
SAF 65	SAF 53	
SAF 87		

Based on the above information, establishment of the following RNA proposals were recommended to provide minimum coverage of the needed SAF cover types.

	SAF Cover Types
Atwood Ridge	40, 44, 52, 60
Barker Bluff	40, 46, 52
Burke Branch	40, 52, 53
LaRue Pine Hills/Otter Pond	40, 52, 59, 60, 65, 75, 76, 87
Panther Hollow	40, 54, 55

APPENDIX III.

Copies of pages selected from the Shawnee National Forest, Land and Resource Management Plan documents describing the Dennison Hollow Research Natural Area and documenting the recommendations of the Forest for its designation and management

Murphysboro Ranger District

13. Oakwood Kite Site	53
14. Toothless Cave	8
15. Cave Spring Cave	120
16. Big Bayou Kite Site	80

Jonesboro Ranger District

1. Atwood Ridge	955
2. Clear Creek Swamp	4
3. LaRue Pine Hills/Otter Pond	3547
4. Opossum Trot Trail	3
5. Ozark Hill Prairies	535
6. Wolf Creek Area	495
7. Bald Knob Geological	7

Detailed descriptions of each of these sites is in the planning record. Analysis details are in Appendix F of this FEIS.

Research Natural Areas

Research Natural Areas are protected areas reserved for nonmanipulative research observation and study. Each area is part of a national network representing a full array of North American ecosystems, biological communities, habitats, and phenomena, and geological and hydrological formations and conditions. Research Natural Areas (RNA's) are established by the Chief of the Forest Service.

There are currently no RNA's established on the Shawnee National Forest; however, four separate proposals have been submitted to the Forest Supervisor for consideration.

As a result of the four proposals submitted to the Forest Supervisor, the following twelve areas were considered for Research Natural Area designation in the planning process:

Table 3-15
Recommended Research Natural Areas

AREA	ACRES 1/
Atwood Ridge	955
Barker Bluff	60
Burke Branch	300
Dennison Hollow	205
Kaskaskia	1,050
Panther Hollow	180
Whoopie Cat Mountain	17
Ozark Hill Prairies	535
LaRue Pine Hills	1,905
Otter Pond	680
Cave Hill	465
Stoneface	176

1/ The acreage shown is as originally proposed. Some modifications have been made in individual alternatives (see Appendix E).

Detailed descriptions of each area and the analysis of RNA proposals is in Appendix E of this FEIS.

Roadless Areas

The Shawnee National Forest does not currently have any areas designated as units of the National Wilderness Preservation System. It does, however, have nine roadless areas which are being considered for their potential as wilderness or for nonwilderness uses. These areas and their acreage are:

Table 3-16
Roadless Areas

Roadless Area	Size (Ac. NFS Land)
Bald Knob	5,888
Burden Falls	2,999
Burke Branch	6,230
Clear Springs	4,777
Garden of the Gods	3,844
Lusk Creek	6,055
Murray Bluff	4,172
Panther Den	722
Ripple Hollow	3,530

These nine areas were originally inventoried in 1977 during the second Roadless Area Review and Evaluation. This study came to be known as RARE II and was completed in 1979 with the issuance of a Final Environmental Statement. Four areas totaling 15,093 acres were recommended for wilderness study: Garden of the Gods, Bald Knob, Clear Springs, and Panther Den. Three areas totaling 13,143 acres were recommended for non-wilderness management: Murray Bluff, Burke Branch, and Ripple Hollow. Two areas totaling 8,883 acres were recommended for further evaluation: Lusk Creek and Burden Falls.

APPENDIX E
RNA Assignment by Alternative

Alternative I

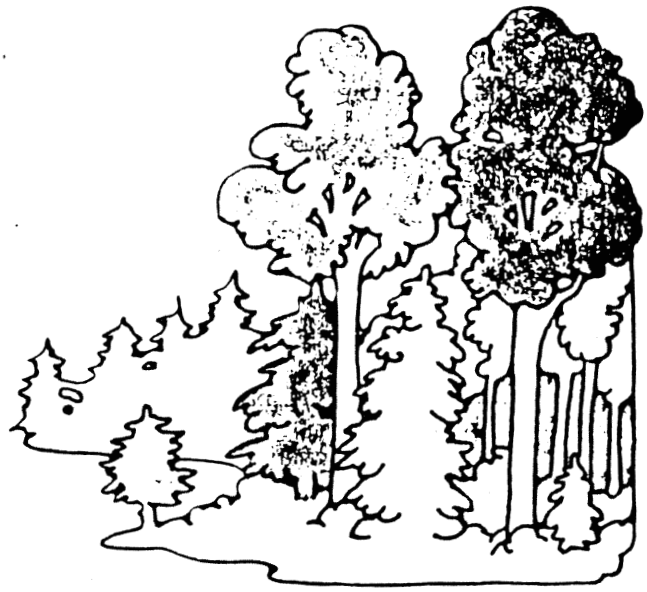
Alternative I emphasizes the maintenance and enhancement of wildlife habitat and preservation of unique natural features. A variety of motorized and nonmotorized recreation features are provided. All proposed Research Natural Areas are recommended for further evaluation.

Management Prescription 8.1

Kaskaskia Experimental Forest

Management Prescription 8.2

Barker Bluff
Atwood Ridge
Burke Branch
LaRue Pine Hills
Otter Pond
Dennison Hollow
Cave Hill
Stoneface
Ozark Hill Prairie
Whoopie Cat Mountain
Panther Hollow



INTRODUCTION

This appendix lists areas of significant physical, biological and cultural features. Where necessary, additional information is provided to assist in implementing management on an area by area basis.

INTENSIVE RESEARCH AREAS

The following areas are assigned to Management Prescription 8.1 to provide for on-going natural resource research and management.

Name	Size (Acres)
Palzo Reclamation Project	325
Dixon Springs Agricultural Research Station	4259
Kaskaskia Experimental Forest	2169
Sugar Creek Seed Orchard	105

NATURAL AREAS

The following areas are assigned to Management Prescription 8.2 (except as noted) to provide for the preservation and protection of their unique scientific or educational values. One or more natural area categories (National Natural Landmark, Research Natural Area Candidate, Botanical Area, etc.) may be assigned to an individual site as warranted.

National Natural Landmarks (existing)

These areas are managed for their landmark features in accordance with the Forest-wide Standards and Guidelines and those in the Management Prescription shown.

Name	Mgmt. Prescription	Size (Acres)
Bell Smith Springs	8.2	1,260
LaRue Pine Hills	8.2	1,905
Little Grand Canyon	8.2	1,023
Lusk Creek	9.3	720
Total Acres		4,908

Candidate Research Natural Areas (RNA)

The following areas will be managed for the site specific features listed. Direction is found in the Forest-wide Standards and Guidelines and those in Management Prescription 8.2. If through evaluation at higher organizational levels and area(s) is not accepted into the National System, it will continue to be managed under Management Prescription 8.2 (or in case of Kaskaskia, 8.1) for the life of the plan.

APPENDIX E
Special Features

Name	Management Prescription	Size(acres)
Atwood Ridge	8.2	955
Barker Bluff	8.2	60
Burke Branch	8.2	300
Cave Hill	8.2	465
Stoneface	8.2	175
Dennison Hollow	8.2	205
Ozark Hill Prairie	8.2	535
Panther Hollow	8.2	180
Whoopie Cat Mountain	8.2	17
Kaskaskia Exp. Forest	8.1	1,050
LaRue Pine Hills/Otter Pond	8.2	2,811
Total		6,753

Atwood Ridge

Location:

The Atwood Ridge RNA proposal is located in portions of Sections 4, 5, 8, 9, 16, and 17, T13S, R2W, Jonesboro Ranger District, Union County.

Area:

955 acres

SAF Cover Types Identified in Area:

SAF 40, SAF 44, SAF 52, SAF 60.

General Information:

The area includes a relic stand of chestnut oak as well as Magnolia acuminata and azalea near the western edge of their respective ranges. In addition, the area includes a number of Indian burial sites. The area is an example of dry, upland Illinois forest. Portions of the northern part of Atwood Ridge have been clearcut. Aside from the clearcuts, the area could provide baseline information on succession in upland hardwood forests.

Selective logging has occurred on some portions of the area. There remains representative mature dry upland forest stands with chestnut oaks that are essentially undisturbed. In many places, the steep slope timber was left (including many chestnut oaks).

A hiking trail exists within the area.

Purpose and Special Features:

To maintain the natural character of a large upland area with a diversity of habitats and to protect the following special features:

-Dry upland forest dominated by the rock chestnut oak (Quercus prinus).

Purpose and Special Features:

To maintain the natural character of an upland, mostly forested area with a diversity of habitats and to protect the following special features:

-Mead's milkweed (Aclepias meadii).
-A sandstone glade community.
-A sandstone cliff community.
-A loess hill prairie community.

This area also contains mesic upland, dry-mesic upland, and dry upland forest stands.

Federal Threatened or Endangered Species:

No records documenting the presence of a Federal T & E Species in this area.

Sensitive Plants and Animals (proposed):

-Mead's Milkweed (Asclepias meadii).

Forest Listed Species:

Loggerhead Shrike (Lanius ludovicianus).

Dennison Hollow:

Location:

The area is located in Section 15 and 16, T10S, R7E, Elizabethtown Ranger District, Saline County.

Area:

205 acres.

SAF Cover Types:

SAF 40, SAF 53.

General Information:

Dennison Hollow contains a dry upland and dry mesic upland forest, a sandstone glade and cliff community.

Purpose and Special Features:

To maintain the natural character of an upland, mostly forested area with a diversity of habitats and to protect the following special features:

-An upland forest with rock chestnut oak (Quercus prinus).
-A sandstone glade.
-A dry-mesic upland forest.
-A sandstone cliff community.
-An example of Caseyville sandstone cliff.

Federal Threatened or Endangered Species:

No documented records for Federal T & E Species in this area.

Sensitive Species (proposed):

No records documenting any sensitive species in this area

Forest Listed Species:

Loggerhead Shrike (Lanius ludovicianus).

Ozark Hill Prairie

Location:

The area is located in portions of Section 31, T13S, R2W, and portions of Sections 5, 6, 7, and 8, T14S, R2W, Jonesboro Ranger District, Alexander County.

Area:

535 acres.

SAF Cover Types:

SAF 40, SAF 52, SAF 64, SAF 60.

General Information:

There is a diversity of habitat including dry, dry-mesic, and mesic forest communities and scattered loess hill prairies.

Parts of the area were logged years ago. There are four wildlife openings being maintained.

Purpose and Special Features:

To maintain the natural character of a large upland, mostly forested area with a diversity of habitats and to protect the following special features:

-Loess hill prairies.
-Mesic and dry-mesic upland forest stands.

This area includes the southernmost loess hill prairie along the Mississippi River. The forest stands include a diversity of habitats ranging from mesic ravines to dry ridgetops.