

Status and Distribution of the Filmy Fern (*Trichomanes boschianum* Sturm.) in Illinois

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ABSTRACT

The filmy fern (*Trichomanes boschianum* Sturm) reaches its northwestern-most extension in Johnson, Hardin, and Pope counties in the Shawnee Hills of Southern Illinois where it grows almost exclusively on Pounds Sandstone of the Caseyville Formation. Twenty-three historic populations were visited and searches were made for new colonies. Although two new colonies were located, nine historic colonies have been extirpated since the 1950s. The condition of 13 of the 16 extant colonies was good, but recreational use threatened five colonies. Visitor use should be restricted and trees should not be removed within 100 meters of the colonies to prevent disturbance of the habitat. Periodic monitoring is recommended.

INTRODUCTION

The filmy fern (*Trichomanes boschianum* Sturm) is a delicate, branching, rhizomatous fern whose habitat is moist sandstone rockhouses, cliffs, and overhangs from Kentucky, southern Ohio, and southern Illinois south to Georgia, Arkansas, South Carolina, and Alabama (Gleason and Cronquist 1991, Mohlenbrock 2002). This taxon reaches its northwestern-most extension in Pope, Hardin, and Johnson counties within the Shawnee Hills of Southern Illinois where it grows almost exclusively on Pounds Sandstone of the Caseyville Formation of early Pennsylvanian age. The grains of Pounds Sandstone are more poorly cemented near the bottom of the layer, resulting in more rapid erosion at the base and the development of overhangs, the primary habitat for the filmy fern in Illinois (Schwegman 1999). Filmy fern is currently classified as endangered in Illinois due to its specialized habitat, small number of populations, and limited distribution (Herkert and Ebinger 2002).

Evers (1961) first documented the distribution of the filmy fern in Illinois. Since that time, additional colonies have been discovered (Schwegman 1982), but no comprehensive assessment of known colonies or searches for new colonies have been conducted. Significant increases in recreational use of the Shawnee National Forest have occurred within the last two decades, increasing the potential for disturbance of filmy fern habitats.

The purpose of this study was to determine colony sizes, habitat requirements, and potential threats as well as to establish management guidelines for filmy fern populations.

METHODS

Photographs and field notes from Dr. Robert A. Evers were obtained from the Illinois Natural History Survey. Searches for specimens were made in herbaria (SIU, ILL, MO) and label data were recorded. Individuals knowledgeable of the flora of southern Illinois were contacted for locations of additional colonies, and other areas of suitable habitat were searched. A total of 23 known locations, as recorded on herbarium labels or in literature (Evers 1961), were visited and searches were made for plants.

When plants were found, the size of the colony, angle of exposure, bedrock type, and distance from the drip line were recorded. The vigor of the population, potential threats, and management recommendations were developed for each colony. Using the photographs of Evers, comparisons were made with the existing colonies.

RESULTS AND DISCUSSION

Fourteen of the 23 historic locations for filmy fern were relocated during field studies. Searches in other areas of suitable habitat in Pope, Johnson, and Hardin counties resulted in the discovery of two previously unknown colonies, increasing the total number of extant colonies to 16. Nine historic colonies have been extirpated since the late 1950s due to habitat alteration.

Except for one colony in Hardin County, all colonies were growing under overhangs of Pounds Sandstone of the Caseyville Formation. Overhangs of this sandstone form the primary habitat for the filmy fern in Illinois. The single exception is the Hardin County colony that is growing along the perimeter of a pit cave entrance partially formed by the collapse of Tar Springs Sandstone.

Of the sixteen extant colonies, thirteen were in good condition based upon vigor of the plants (Table 1). The remaining three were considered to be in poor health due to reduced leaf densities and sizes. One of these colonies had an uncharacteristic glaucous sheen. Colonies having these characters were considered to be in decline by Evers (1961). Comparisons of 1999 photographs with those of Evers from 1959 verified the reduced size of these three colonies.

All of the colonies experienced some direct sunlight for a portion of the day during the summer. Some colonies had considerably more sunlight during the winter but apparently are tolerant of increased exposure to sunlight during colder months (Evers 1961). Of the 16 extant populations, nine face east and six face west. The colony in the pit cave in Hardin County has east, west, and south exposures. None of the colonies have northern exposures (Table 1).

There was no correlation between the distance of the filmy fern colony from the drip line. This distance, which varied from zero to 21 m, also had no apparent effect on colony size. The second largest colony (600 cm) and one of the smallest colonies (80 cm) were

immediately adjacent to the drip line while the largest colony (900 cm) was 21 m away (Table 1).

Population loss is expected to continue due to habitat alteration. Recreational use currently threatens five colonies on Shawnee National Forest lands. Large sandstone overhangs are attractive to humans, and continued high visitor use could result in habitat alteration and the decline of additional filmy fern populations. Management recommendations include controlled visitor use and no tree removal within 100 meters of colonies. One population occurs within a privately owned hog lot and efforts should be made to remove the hogs from the area. All populations should continue to be monitored in the future.

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Table 1. Size, exposure, distance from drip line, and condition of filmy fern (*Trichomanes boschianum* Sturm.) populations in Hardin, Pope, and Johnson counties, Illinois.

Site	Population Length (cm)	Exposure Angle	Distance from Drip Line (m)	Condition
Hardin	600	E to S to W	0 to 1	Good
Johnson # 1	499	N 75° E	6.0	Good
Johnson # 2	134	N 75° E	1.8	Good
Johnson # 3	54	S 85° E	3.57	Good
Johnson # 4	161	N 40° W	5.7	Good
Johnson # 5	523	N to S 75° W	8.0	Good
Johnson # 6	201	S 50° W	4.4	Good
Johnson # 7	103	N 35° E	7.7	Poor
Johnson # 8	103	N 90° E	6.8	Good
Pope # 1	48	N 80° E	4.6	Good
Pope # 2	16.5	S 90° W	7.1	Poor
Pope # 3	104	S 30° W	11.5	Poor
Pope # 4	944	S 35° E	21.0	Good
Pope # 5	80	N 55° W	0.7	Good
Pope # 6	128	N 35° E	0.1 >0.7	Good
Pope # 7	107	S 40° E	2.0	Good