

1983

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Thomas G. Lammers  
*Ohio State University*

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### Recommended Citation

Lammers, Thomas G. (1983) "The Vascular Flora of Roggman Boreal Slopes Preserve, Clayton County, Iowa," *Proceedings of the Iowa Academy of Science*, 90(3), 107-111.

Available at: <https://scholarworks.uni.edu/pias/vol90/iss3/9>

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## The Vascular Flora of Roggman Boreal Slopes Preserve, Clayton County, Iowa

THOMAS G. LAMMERS

Department of Botany, The Ohio State University, Columbus, OH 43210

Charles and Anna Roggman Boreal Slopes is a 20 acre (8.1 ha) Nature Conservancy preserve situated on the floodplain and adjacent north-facing slope of a tributary of Buck Creek in Clayton County, northeastern Iowa. My study of the preserve in 1981 revealed a vascular flora of 160 species representing 59 families. Three plant communities were recognized: ash-elm on the floodplain, maple-basswood on the slope, and an unusual "boreal slope" community in areas of the slope with cold air drainage. The last contains several species with boreal American or circumboreal distributions which have probably persisted since the Pleistocene. Eleven species protected by state and federal laws inhabit the preserve. The most significant is *Aconitum noveboracense* Gray, known from only 17 localities worldwide, listed as endangered in Iowa and as threatened in the United States.

INDEX DESCRIPTORS: Roggman Boreal Slopes; Clayton County, Iowa; Iowa flora; The Nature Conservancy; endangered species; boreal species; relict species; *Aconitum noveboracense* Gray.

Thomas G. Hartley was apparently the first to note the presence of certain rare plants in the Buck Creek drainage of Clayton County, Iowa. Hartley's reports (1962, 1966) attracted the attention of The Nature Conservancy, a national conservation organization dedicated to the protection of significant natural areas through acquisition and management (Burk 1973, Roosa 1981). In July 1980, The Nature Conservancy acquired 20 acres (8.1 ha) in the Buck Creek drainage through the gift of Arnold and Laverne Roggman and Bernadine Fiete. This tract was named Charles and Anna Roggman Boreal Slopes in honor of the donors' parents.

Nature Conservancy policies require the preparation of a resource inventory and management plan for each preserve. I was contracted by The Nature Conservancy during 1981 to prepare such a plan for Roggman Boreal Slopes. It was originally believed that much of the floristic data for the inventory could be drawn from Hartley's studies. However, Hartley's collection localities were not specific enough to distinguish plants collected at Roggman Boreal Slopes from those collected elsewhere in the Buck Creek drainage. Consequently, it was necessary to visit the preserve several times during the 1981 growing season to determine the actual composition of its flora.

The purpose of this report is to summarize the results of this field study. This involves three aspects: a description of the plant communities, an annotated checklist of all vascular plants observed, and a discussion of the endangered, threatened, and otherwise rare species.

### STUDY AREA

Charles and Anna Roggman Boreal Slopes is a 20 acre (8.1 ha) nature preserve in Clayton County, northeastern Iowa. It is located approximately 3 miles (5 km) southeast of the town of Garnaville in Andy Hollow, a tributary of Buck Creek, in the NW $\frac{1}{4}$  section 27 and NE $\frac{1}{4}$  section 28, T93N R3W Garnaville Township.

The preserve lies within the Driftless Area, a landform region in the upper Midwest which was long believed to have escaped Pleistocene glaciation. However, isolated patches of glacial till have been discovered throughout the Iowa portion and it now appears that at least that portion of the Driftless Area was glaciated, probably during Nebraskan Time (Trowbridge 1966). Because of this new understanding of the region, Prior (1976) has recently introduced the term "Paleozoic Plateau" for the Iowa portion of the Driftless Area.

The Paleozoic Plateau is characterized by rugged local relief, a general absence of glacial drift, and thin discontinuous loess deposits (Prior 1976). Paleozoic bedrock lies at or near the surface and is deeply dissected by numerous erosive streams. These stream valleys are narrow and V-shaped and often lined with steep talus and vertical rock escarpments. This is in sharp contrast with much of the remainder of Iowa, where gently rolling terrain and thick deposits of drift and loess

are the rule.

The vicinity of Roggman Boreal Slopes is typical of the Paleozoic Plateau landscape. The preserve is located on the steep north-facing slope and adjacent bottomlands of a narrow V-shaped stream valley. Extensive areas of talus and bedrock outcrops occur on the slope. The elevation rises from approximately 780 ft (237 m) along the streambed to approximately 920 ft (280 m) at the crest of the slope (United States Geological Survey 1962). This vertical increase of 140 ft (43 m) occurs over a horizontal distance of less than 200 ft. (61 m), causing slopes to exceed 25%.

The bedrock exposed at Roggman Boreal Slopes is part of the Niagaran Escarpment and consists of Silurian dolomite (Niagara Series) overlying Ordovician shale (Maquoketa Formation) and limestone (Galena Formation) (Leonard 1906). The Niagaran dolomite is extensively fractured, resulting in an increased susceptibility to weathering and the formation of large areas of talus. In these talus areas, water moves along the joints and fractures, dissolving the carbonate bedrock. This results in the formation of numerous subterranean solution cavities. Where these meet the surface, naturally refrigerated air flows outward and downslope over the talus.

The soils of Roggman Boreal Slopes belong to the Fayette-Nordness-Steep Rock Land Soil Association (Soil Conservation Service 1978). Three soil mapping units occur within the preserve: Steep Rock Land, 25% or greater slopes; Dubuque Silt Loam, 18-25% slopes; and the Dorchester-Volney complex, 2-5% slopes. The first two, which comprise the north-facing slope, are well drained to excessively drained silt loam soils formed in residuum and loess over fractured bedrock. The third is a mosaic of well drained to somewhat excessively drained silty alluvial soils which occur on the bottomlands.

The climate of the region is humid continental, typified by warm summers, cold winters, and a uniform distribution of precipitation. At nearby Elkader (Cahayla-Wynne and Glenn-Lewin 1978), the mean January temperature is 15.8°F (-9.0°C) and the July mean is 73.9°F (23.3°C). Extremes of -36°F (-38°C) and 111°F (44°C) have been recorded. The mean annual precipitation is 32.8 in (83.3 cm) and the mean annual growing season is 149 days (7 May to 3 October).

### PLANT COMMUNITIES

Regionally, Roggman Boreal Slopes lies within the Maple-Basswood Association, a region in which maple-basswood forest communities are considered the climax vegetation (Braun 1950, Küchler 1964). However, Cahayla-Wynne and Glenn-Lewin (1978) suggest that it is more accurate to classify the regional vegetation of the Paleozoic Plateau as a mixed oak forest, noting that maple-

basswood communities develop only on the most mesic sites. I recognize three plant communities at Roggman Boreal Slopes: boreal slope, maple-basswood, and ash-elm.

**Boreal Slope Community**

This community occurs on the steep north-facing slope in areas of cold air drainage over dolomitic talus. Tree cover is less than 20% and consists primarily of scattered *Betula lutea*, *B. papyrifera*, and *Fraxinus nigra*. The talus is thickly carpeted with mosses and large areas are covered with tangled mats of *Taxus canadensis*. A variety of shrubs are scattered on the talus, including *Corylus cornuta*, *Rhamnus alnifolia*, *Rubus strigosus*, *Salix bebbiana*, *S. discolor*, *Sambucus pubens*, and *Viburnum trilobum*. Characteristic herbs include *Aconitum noveboracense*, *Arabis lyrata*, *Campanula rotundifolia*, *Carex eburnea*, *C. media*, *C. peckii*, *Circaea alpina*, *Cornus canadensis*, *Cryptogramma stelleri*, *Cystopteris bulbifera*, *Epilobium angustifolium*, *Equisetum scirpoides*, *Galium boreale*, *Gymnocarpium robertianum*, *Impatiens biflora*, *Linnaea borealis*, *Luzula acuminata*, *Solidago sciaphila*, and *Streptopus roseus*.

Several of the species listed above are disjunct from boreal American or circumboreal distributions and are interpreted as relicts of the coniferous forests that covered much of Iowa during Wisconsinian time (Hartley 1962, Cushing 1965). When the climate became warm and dry at the end of the Wisconsin glaciation, this coniferous forest migrated northward to Canada and the Great Lakes region. Some species, mostly small herbs, persisted in northeastern Iowa where cold air drainage, slope aspect, and substrate created a cool moist microclimate. In some cases, these species are now disjunct from their nearest populations to the north by several hundred miles (Roosa and Eilers 1978).

In this community there is an interesting juxtaposition of elements derived from two disparate vegetation types. Plants that inhabit tamarack bogs, sphagnum bogs, and low sandy acid woods farther north (e.g., *Cornus canadensis*, *Linnaea borealis*, *Rhamnus alnifolia*, *Sambucus pubens*) grow side-by-side with plants that inhabit rock cliffs and ledges (e.g., *Campanula rotundifolia*, *Carex eburnea*, *Cryptogramma stelleri*, *Cystopteris bulbifera*, *Solidago sciaphila*). The cold air drainage over the mossy sheltered slope simulates conditions in a northern bog while the dolomitic talus provides a suitable substrate for cliff-dwelling and calciphilous species.

**Maple-Basswood Community**

This community occupies those portions of the north-facing slope which lack cold air drainage. The protection from sun, wind, and fire afforded by slope aspect allows this community to replace the oak-hickory communities found in more exposed situations (Cooperrider 1962a).

*Acer saccharum* and *Tilia americana* are dominant and *Quercus borealis* is of secondary importance. *Carpinus caroliniana*, *Dirca palustris*, *Ostrya virginiana*, and *Staphylea trifolia* are frequent understory trees. The shrub layer consists of *Cornus alternifolia*, *C. rugosa*, *Ribes cynosbati*, *Taxus canadensis*, and *Viburnum rafinesquianum* var. *affine*. Characteristic herbs include *Adiantum pedatum*, *Allium tricoccum*, *Asarum canadense*, *Carex albursina*, *C. careyana*, *Dicentra canadensis*, *D. cucullaria*, *Dryopteris goldiana*, *D. spinulosa*, *Hepatica acutiloba*, *Mitella diphylla*, *Monotropa uniflora*, *Orchis spectabilis*, *Panax quinquefolius*, *Polymnia canadensis*, *Sanguinaria canadensis*, and *Solidago flexicaulis*.

**Ash-Elm Community**

This community occurs on the bottomlands of the stream. *Fraxinus nigra*, *F. pennsylvanica*, and *Ulmus rubra* are dominant. *Acer nigrum*, *A. saccharinum*, *Celtis occidentalis*, *Juglans nigra*, *Populus deltoides*, and *Ulmus thomasi* are of secondary importance. Characteristic herbs and vines include *Equisetum hyemale*, *Hydrophyllum virginianum*, *Laportea canadensis*, *Menispermum canadense*, *Polygonum virginianum*, *Ranunculus septentrionalis*, *Smilax hispida*, *Toxicodendron radicans* ssp. *negundo*, *Urti-*

*ca dioica*, and *Vitis riparia*. A few species grow only in the shallow water or wet margin of the stream, most notably *Stellaria aquatica* and *Nasturtium officinale*.

**ANNOTATED CHECKLIST**

The annotated checklist of the vascular plants of Roggman Boreal Slopes is based entirely upon my field study conducted between 30 April and 2 October 1981. A complete set of voucher specimens is deposited in the Herbarium of the University of Northern Iowa and selected duplicates have been distributed to Iowa State University, The Ohio State University, and other herbaria. A total of 160 species, representing 59 families, was collected.

The arrangement of the checklist is alphabetical. Nomenclature is in general agreement with Gleason and Cronquist (1963). An asterisk (\*) preceding a binomial indicates that the species is not indigenous to the preserve. A subjective approximation of the relative frequency of occurrence within the preserve is given for each species according to the following criteria: *common*, a dominant or abundant species; *frequent*, a species of regular occurrence; *infrequent*, a species of irregular occurrence; and *rare*, a species of which only a few individuals could be located. The community in which a species occurs is denoted by numbers: boreal slope (1), maple-basswood (2), and ash-elm (3). Plants which inhabit the stream are denoted by (4). Species listed as threatened or endangered by the state of Iowa (Roosa and Eilers 1978) are so indicated, and discussed at length in the next section.

**EQUISETOPHYTA**

**EQUISETACEAE**

- Equisetum hyemale* L. Infrequent; 3.
- Equisetum pratense* Ehrh. Infrequent; 1. Threatened.
- Equisetum scirpoides* Michx. Infrequent; 1. Endangered.

**POLYPODIOPHYTA**

**ADIANTACEAE**

- Adiantum pedatum* L. Frequent; 2.
- Cryptogramma stelleri* (J. F. Gmel.) Prantl Infrequent; 1.

**ASPLENIACEAE**

- Asplenium rhizophyllum* L. Infrequent; 2.
- Athyrium angustum* (Willd.) Presl. Frequent; 2.
- Cystopteris bulbifera* (L.) Bernh. Common; 1, 2.
- Dryopteris goldiana* (Hook.) Gray Infrequent; 2.
- Dryopteris spinulosa* (O. F. Muell.) Watt Infrequent; 2.
- Gymnocarpium robertianum* (Hoffm.) Newm. Infrequent; 1. Endangered.
- Matteuccia struthiopteris* (L.) Todaro Infrequent; 2.

**OPHIOGLOSSACEAE**

- Botrychium virginianum* (L.) Sw. Infrequent; 2.

**OSMUNDACEAE**

- Osmunda claytoniana* L. Infrequent; 2.

**PINOPHYTA**

**TAXACEAE**

- Taxus canadensis* Marsh. Common; 1, 2.

**MAGNOLIOPHYTA: MAGNOLIOPSIDA**

**ACERACEAE**

- Acer negundo* L. Infrequent; 3.
- Acer nigrum* Michx. f. Frequent; 3.
- Acer saccharinum* L. Common; 3.
- Acer saccharum* Marsh. Common; 2.

## ADOXACEAE

*Adoxa moschatellina* L. Rare; 1. Threatened.

## ANACARDIACEAE

*Toxicodendron radicans* (L.) Kuntze ssp. *negundo* (Greene) Gillis  
Common; 2, 3.

## APIACEAE

*Cryptotaenia canadensis* (L.) DC Infrequent; 3.  
*Osmorhiza claytonii* (Michx.) C. B. Clarke Common; 2.  
*Sanicula trifoliata* Bickn. Frequent; 2.  
*Thaspium barbinode* (Michx.) Nutt. Infrequent; 2.

## ARALIACEAE

*Aralia racemosa* L. Infrequent; 2.  
*Panax quinquefolius* L. Frequent; 2.

## ARISTOLOCHIACEAE

*Asarum canadense* L. Frequent; 2.

## ASTERACEAE

*Aster lateriflorus* (L.) Britt. Infrequent; 2.  
*Aster shortii* Lindl. Frequent; 2.  
*Eupatorium rugosum* Houtt. Common; 2.  
*Polymnia canadensis* L. Frequent; 2.  
*Prenanthes alba* L. Frequent; 1, 2.  
*Solidago flexicaulis* L. Common; 2.  
*Solidago sciaphila* Steele Frequent; 1.

## BALSAMINACEAE

*Impatiens biflora* Walt. Common; 1, 2, 3.  
*Impatiens pallida* Nutt. Frequent; 2, 3.

## BERBERIDACEAE

*Caulophyllum thalictroides* (L.) Michx. Infrequent; 2.  
*Podophyllum peltatum* L. Infrequent; 2.

## BETULACEAE

*Betula lutea* Michx. f. Infrequent; 1.  
*Betula papyrifera* Marsh. Infrequent; 1.  
*Carpinus caroliniana* Walt. Common; 2.  
*Corylus cornuta* Marsh. Infrequent; 1, 2.  
*Ostrya virginiana* (Mill.) K. Koch Common; 2.

## BRASSICACEAE

*Arabis lyrata* L. Infrequent; 1.  
*Dentaria laciniata* Muhl. ex Willd. Frequent; 2.  
\**Nasturtium officinale* R. Br. Infrequent; 4. Naturalized from  
Eurasia.

## CAMPANULACEAE

*Campanula americana* L. Infrequent; 3.  
*Campanula rotundifolia* L. Frequent; 1.  
*Lobelia syphilitica* L. Infrequent; 4.

## CAPRIFOLIACEAE

*Linnaea borealis* L. Rare; 1. Endangered.  
*Sambucus pubens* Michx. Infrequent; 1, 2.  
*Virburnum rafinesquianum* Schultes var. *affine* (Bush) House  
Infrequent; 2.  
*Virburnum trilobum* Marsh. Infrequent; 1.

## CARYOPHYLLACEAE

*Cerastium arvense* L. Infrequent; 1. Endangered.  
\**Stellaria aquatica* (L.) Scop. Infrequent; 4. Naturalized from  
Eurasia.

## CORNACEAE

*Cornus alternifolia* L. f. Common; 2.  
*Cornus canadensis* L. Rare; 1. Endangered.

*Cornus rugosa* Lam. Frequent; 1, 2.

## EUPHORBIACEAE

*Acalypha rhomboidea* Raf. Infrequent; 3.

## FABACEAE

*Amphicarpa bracteata* (L.) Fern. Frequent; 2.  
*Desmodium glutinosum* (Muhl. ex Willd.) Wood Frequent; 2.  
*Desmodium nudiflorum* (L.) DC Infrequent; 2.

## FAGACEAE

*Quercus alba* L. Infrequent; 2.  
*Quercus borealis* Michx. f. Common; 2.  
*Quercus muhlenbergii* Engelm. Infrequent; 2.

## FUMARIACEAE

*Dicentra canadensis* (Goldie) Walp. Frequent; 2.  
*Dicentra cucullaria* (L.) Bernh. Common; 2.

## GERANIACEAE

*Geranium maculatum* L. Frequent; 2.

## HYDROPHYLLACEAE

*Hydrophyllum appendiculatum* Michx. Frequent; 2, 3.  
*Hydrophyllum virginianum* L. Common; 2, 3.

## JUGLANDACEAE

*Carya cordiformis* (Wang.) K. Koch Infrequent; 2.  
*Juglans cinerea* L. Infrequent; 2, 3.  
*Juglans nigra* L. Infrequent; 2, 3.

## LAMIACEAE

*Blephila hirsuta* (Pursh) Benth. Infrequent; 1, 2.

## MENISPERMACEAE

*Menispermum canadense* L. Infrequent; 3.

## MONOTROPACEAE

*Monotropa uniflora* L. Infrequent; 2.

## OLEACEAE

*Fraxinus nigra* Marsh. Infrequent; 1, 2, 3.  
*Fraxinus pennsylvanica* Marsh. Common; 2, 3.

## ONAGRACEAE

*Circaea alpina* L. Frequent; 1.  
*Circaea lutetiana* L. ssp. *canadensis* (L.) Aschers. & Magnus  
Frequent; 2.  
*Epilobium angustifolium* L. Rare; 1.

## PAPAVERACEAE

*Sanguinaria canadensis* L. Frequent; 2.

## PHRYMACEAE

*Phryma leptostachya* L. Common; 2.

## POLEMONIACEAE

*Polemonium reptans* L. Infrequent; 2.

## POLYGONACEAE

*Polygonum virginianum* L. Infrequent; 3.

## PORTULACACEAE

*Claytonia virginica* L. Common; 2, 3.

## RANUNCULACEAE

*Aconitum noveboracense* Gray Infrequent; 1. Endangered, fed-  
eral threatened.  
*Actaea alba* (L.) Mill. Infrequent; 2.  
*Actaea rubra* (Ait.) Willd. Frequent; 1, 2.  
*Anemone canadensis* L. Infrequent; 3.

*Anemone quinquefolia* L. Infrequent; 2.  
*Anemonella thalictroides* (L.) Spach Infrequent; 2.  
*Aquilegia canadensis* L. Frequent; 1, 2.  
*Hepatica acutiloba* DC Frequent; 2.  
*Isopyrum biternatum* (Raf.) Torr. & Gray Infrequent; 2.  
*Ranunculus abortivus* L. Infrequent; 3.  
*Ranunculus septentrionalis* Poir. Infrequent; 3.

RHAMNACEAE

*Rhamnus alnifolia* L'Her. Frequent; 1.

ROSACEAE

*Fragaria vesca* L. ssp. *americana* (Porter) Staudt Infrequent; 1, 2.  
*Geum canadense* Jacq. Frequent; 2, 3.  
*Physocarpus opulifolius* (L.) Maxim. Infrequent; 2.  
*Prunus virginiana* L. Infrequent; 2.  
*Rubus strigosus* Michx. Frequent; 1, 2.

RUBIACEAE

*Galium aparine* L. Frequent; 3.  
*Galium boreale* L. Infrequent; 1.  
*Galium circaezans* Michx. Infrequent; 2.  
*Galium concinnum* Torr. & Gray Infrequent; 2.  
*Galium triflorum* Michx. Frequent; 1, 2.

SALICACEAE

*Populus deltoides* Bartr. ex Willd. Infrequent; 3.  
*Populus grandidentata* Michx. Infrequent; 2.  
*Salix bebbiana* Sarg. Infrequent; 1.  
*Salix discolor* Muhl. Infrequent; 1.

SAXIFRAGACEAE

*Mitella diphylla* L. Common; 2.  
*Ribes cynosbati* L. Frequent; 2.

STAPHYLEACEAE

*Staphylea trifolia* L. Frequent; 2.

THYMELEACEAE

*Dirca palustris* L. Frequent; 1, 2.

TILIACEAE

*Tilia americana* L. Common; 2.

ULMACEAE

*Celtis occidentalis* L. Infrequent; 3.  
*Ulmus rubra* Muhl. Common; 2, 3.  
*Ulmus thomasi* Sarg. Infrequent; 2, 3.

URTICACEAE

*Laportea canadensis* (L.) Wedd Common; 2, 3.  
*Parietaria pensylvanica* Muhl. ex Willd. Infrequent; 2.  
*Pilea pumila* (L.) Gray Frequent; 3.  
*Urtica dioica* L. Common; 3.

VIOLACEAE

*Viola pubescens* Ait. var. *eriocarpa* (Schw.) Russell Frequent; 3.  
*Viola sororia* Willd. Common; 2.

VITACEAE

*Parthenocissus quinquefolia* (L.) Planch. Common; 2.  
*Vitis riparia* Michx. Frequent; 3.

MAGNOLIOPHYTA: LILIOPSIDA

ARACEAE

*Arisaema triphyllum* (L.) Schott Common; 2.

CYPERACEAE

*Carex albursina* Sheld. Common; 2.  
*Carex blanda* Dewey Infrequent; 2, 3.

*Carex careyana* Dewey Infrequent; 2. Threatened.  
*Carex eburnea* Boott Infrequent; 1.  
*Carex media* R. Br. Rare; 1. Endangered.  
*Carex peckii* E. C. Howe Infrequent; 1.  
*Carex pensylvanica* Lam. Frequent; 2.  
*Carex rosea* Schkuhr ex Willd. Common; 2.  
*Carex sparganioides* Muhl. ex Willd. Frequent; 2.  
*Carex sprengelii* Dewey ex Spreng. Frequent; 2.

JUNCACEAE

*Luzula acuminata* Raf. Infrequent; 1.

LILIACEAE

*Allium tricoccum* Ait. var. *tricoccum* Common; 2.  
*Allium tricoccum* Ait. var. *burdickii* Hanes Rare; 2.  
*Maianthemum canadense* Desf. Infrequent; 2.  
*Polygonatum pubescens* (Willd.) Pursh Infrequent; 2.  
*Smilacina racemosa* (L.) Desf. Common; 2.  
*Streptopus roseus* Michx. Rare; 1. Threatened.  
*Trillium flexipes* Raf. Frequent; 2.  
*Uvularia grandiflora* Sm. Frequent; 2.

ORCHIDACEAE

*Corallorhiza maculata* (Raf.) Raf. Rare; 2.  
*Cypripedium calceolus* L. var. *pubescens* (Willd.) Correll Rare; 1.  
*Goodyera pubescens* (Willd.) R. Br. Rare; 2.  
*Orchis spectabilis* L. Rare; 2.

POACEAE

*Elymus virginicus* L. Infrequent; 3.  
*Festuca obtusa* Biehler Infrequent; 2.  
*Hystrix patula* Moench Frequent; 2.  
*Leersia virginica* Willd. Infrequent; 2.  
*Oryzopsis racemosa* (Sm.) Ricker Infrequent; 2.  
*Poa sylvestris* Gray Infrequent; 2.

SMILACACEAE

*Smilax ecirrhata* (Engelm. ex Kunth) S. Wats. Frequent; 2.  
*Smilax hispida* Muhl. Infrequent; 2, 3.

ENDANGERED, THREATENED, AND RARE SPECIES

A total of 11 species protected by state and federal laws were observed at Roggman Boreal Slopes in 1981. The majority of these occur in the boreal slope community and are species with broad boreal American or circumboreal distributions. Iowa State Preserves Advisory Board Ecologist Dean M. Roosa (pers. comm.) considers Roggman Boreal Slopes the single most important site in the state for the protection of endangered, threatened, and rare species.

The most significant species at Roggman Boreal Slopes is *Aconitum noveboracense*, listed as endangered by the State of Iowa and as threatened by the federal government (Roosa and Eilers 1978). In contrast to the other protected species, which are widely distributed outside Iowa, the total distribution of *A. noveboracense* is very limited. Only 17 extant populations (comprising an estimated 6000 individuals) are known in three small areas: the Driftless Area of northeastern Iowa and southwestern Wisconsin; northeastern Ohio; and the Catskill Mountains of New York (Read and Hale 1981). Seven of the 17 populations and 2400 of the 6000 individuals are in Iowa. In addition to the population at Roggman Boreal Slopes, there are two other populations in Clayton County, two in Allamakee County, and one each in Dubuque and Jackson Counties. Read and Hale (1981) rank the Roggman population, which contains approximately 300 plants, as the third largest population in Iowa and the sixth or seventh largest overall.

*Carex media* and *Linnaea borealis* are listed as endangered in Iowa

(Roosa and Eilers 1978) but are widespread throughout boreal America. Roggman Boreal Slopes is the only Iowa locality at which these two species occur. Until recently, *Cornus canadensis* was also believed to be restricted in Iowa to Roggman Boreal Slopes. However, a second population of this circumboreal species was discovered late in 1980 near Decorah, Winneshiek County, by Alan Branham (Dean M. Roosa, pers. comm.).

Three other species listed as endangered in the state were found at Roggman Boreal Slopes: *Cerastium arvense*, *Equisetum scirpoides*, and *Gymnocarpium robertianum*. Each is circumboreal in its distribution and inhabits the boreal slope community. In Iowa, these species are restricted to a few localities in Allamakee, Clayton, Dubuque, and Winneshiek Counties (Roosa and Eilers 1978).

Four species listed as threatened in the state were also found: *Adoxa moschatellina*, *Equisetum pratense*, *Streptopus roseus*, and *Carex careyana*. The first three have a boreal American or circumboreal distribution and inhabit the boreal slope community. The fourth is the only protected species at Roggman Boreal Slopes which is not found in the boreal slope community. *Carex careyana* occurs in the maple-basswood community and is widely distributed throughout the deciduous forest region of eastern North America. These four species occur at scattered localities in the northeastern quarter of Iowa.

One species collected at Roggman Boreal Slopes is of special interest because it is endemic to the Driftless Area. *Solidago sciaphila* is restricted to limestone and sandstone cliffs, ledges, and talus in northeastern Iowa, northwestern Illinois, southeastern Minnesota, and southwestern Wisconsin (Gleason and Cronquist 1963, Cushing 1965). In Iowa, it is rather frequent in Allamakee, Clayton, Clinton, Dubuque, Jackson, and Winneshiek Counties (Cooperrider 1962b, Hartley 1962).

Several other vascular plants collected at Roggman Boreal Slopes are generally considered rare in Iowa, with distributions largely confined to the northeastern counties (Thorne 1953, 1956). Among such species are *Betula lutea*, *B. papyrifera*, *Carex peckii*, *Circaea alpina*, *Corallorhiza maculata*, *Corylus cornuta*, *Cryptogramma stelleri*, *Dryopteris goldiana*, *Epilobium angustifolium*, *Maianthemum canadense*, *Polygonatum pubescens*, *Rhamnus alnifolia*, *Sambucus pubens*, *Taxus canadensis*, and *Viburnum trilobum*.

#### ACKNOWLEDGEMENTS

This report is based on a portion of a resource inventory and management plan prepared for and funded by The Nature Conservancy and is published with their permission. I would like to thank the following persons for their generous assistance: Rex R. Boner, John Brayton, Lawrence Canterra, Lawrence J. Eilers, Gordy Miller,

Robert H. Read, Dean M. Roosa, Robert Van Ersvelde, and William Watson.

#### REFERENCES

- BRAUN, E. L. 1950. Deciduous forests of eastern North America. Blakiston, Philadelphia.
- BURK, M. 1973. Natural areas owned by the Iowa Chapter of The Nature Conservancy. Proc. Iowa Acad. Sci. 80:175-177.
- CAHAYLA-WYNNNE, R., and D. G. GLENN-LEWIN. 1978. The forest vegetation of the Driftless Area, northeast Iowa. Amer. Midland Naturalist 100:307-319.
- COOPERRIDER, T. S. 1962a. The flora of north-facing slopes compared to that of the surrounding area in eastern Iowa. Amer. Midland Naturalist 67:369-372.
- COOPERRIDER, T. S. 1962b. The vascular plants of Clinton, Jackson, and Jones Counties, Iowa. Stud. Nat. Hist. Iowa Univ. 20(5):1-80.
- CUSHING, E. J. 1965. Problems in the Quaternary phyto-geography of the Great Lakes Region, pp. 403-416. In Wright, H. E., Jr., and D. G. Frey (eds.), The Quaternary of the United States. Princeton University Press, Princeton.
- GLEASON, H. A., and A. CRONQUIST. 1963. Manual of the vascular plants of the northeastern United States and adjacent Canada. Van Nostrand, New York.
- HARTLEY, T. G. 1962. The flora of the "Driftless Area". Ph.D. dissertation, University of Iowa, Iowa City.
- HARTLEY, T. G. 1966. The flora of the "Driftless Area". Stud. Nat. Hist. Iowa Univ. 21(1):1-174.
- KÜCHLER, A. W. 1964. Potential natural vegetation of the conterminous United States. American Geographical Society, New York.
- LEONARD, A. G. 1906. Geology of Clayton County. Annual Rep. Iowa Geol. Surv. 16:213-306.
- PRIOR, J. C. 1976. A regional guide to Iowa landforms. Educational Series #3, Iowa Geological Survey, Iowa City.
- READ, R. H., and J. G. HALE. 1981. Draft national recovery plan for northern monkshood (*Aconitum noveboracense*). Wisconsin Department of Natural Resources, Madison.
- ROOSA, D. M. 1981. Iowa natural heritage preservation: history, present status, and future challenges. Proc. Iowa Acad. Sci. 88:43-47.
- ROOSA, D. M., and L. J. EILERS. 1978. Endangered and threatened Iowa vascular plants. Special Report #5, Iowa State Preserves Advisory Board, Des Moines.
- Soil Conservation Service. 1978. Clayton County, Iowa, Advance Field Sheets #62 and #63. Elkader, Iowa.
- THORNE, R. F. 1953. Notes on rare Iowa plants. Proc. Iowa Acad. Sci. 60:260-274.
- THORNE, R. F. 1956. Notes on rare Iowa plants II. Proc. Iowa Acad. Sci. 63:214-227.
- TROWBRIDGE, A. C. 1966. Glacial drift in the "Driftless Area" of northeast Iowa. Report of Investigations #2, Iowa Geological Survey, Iowa City.
- United States Geological Survey. 1962. Garnavillo quadrangle, 7.5 minute series topographic map.