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## Additions to the Pteridophyte Flora of Iowa - II

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## Additions to the Pteridophyte Flora of Iowa — II.

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Two hybrid wood ferns (*Dryopteris* X *bootii* [Tuckerm.] Underw. and *Dryopteris* X *uliginosa* [A. Br.] Druce) are reported as new to Iowa. An additional 118 county records for 30 species and hybrids are summarized. Observations on possibly extirpated Iowa pteridophytes and on the status of extant populations of the rarest Iowa pteridophytes are reported, including the rediscovery of *Isoetes melanopoda*, not observed in Iowa since its original discovery in 1863. The Iowa pteridophyte flora, the subject of a decade of field and herbarium study, consists of 57 species and 7 hybrids, supported with 1450 county collections.

INDEX DESCRIPTORS: *Dryopteris* X *bootii*, *Dryopteris* X *uliginosa*, Ferns, Fern allies, Iowa vascular flora, *Isoetes melanopoda*, Pteridophytes, threatened and endangered species.

The pteridophytes (ferns and fern allies) of Iowa have been the subject of intense floristic study for the past decade. Resulting from this has been an extensive annotated bibliography on Iowa literature (Peck, 1976a), a summary of herbarium collections, principal collectors, and the floristic status of each Iowa taxon (Peck, 1976b), and documentation of rare, threatened, and possibly extirpated Iowa pteridophytes (Peck, 1978). Additional state and county records were noted and subsequently reported (Peck, 1980a). This report describes the discovery and location of two new state records, summarizes the voucher data on 118 new county records, and summarizes observations on possibly extirpated, endangered, and threatened Iowa pteridophytes, based upon field and herbarium study conducted from 1972 through 1982. Herbarium specimens are cited with the herbarium where they are located denoted with a standard herbarium code: GH = Grey Herbarium, Harvard University, IA = University of Iowa, ISC = Iowa State University, ISTC = University of Northern Iowa, MICH = University of Michigan, and MO = St. Louis Missouri Botanical Garden.

## STATE RECORDS

Of the 42 *Dryopteris* (wood ferns) taxa (13 species and 29 hybrids) known from North America (Montgomery and Paulton, 1981), five species were known from Iowa in 1976: *D. cristata*, *D. goldiana*, *D. intermedia*, *D. marginalis*, and *D. spinulosa* (Peck, 1976b). Hybrid *Dryopteris* taxa were not known from Iowa until the discovery of *Dryopteris* X *triploidea* Wherry in 1979 at a locality in Allamakee County (Peck, 1980a; Peck, Roosa, and Eilers, 1980). This discovery stimulated continued field search in northeastern Iowa for additional localities of this hybrid and populations of other hybrid taxa. Two additional stations of *D. triploidea* were located; two hybrids not previously known from Iowa were also located.

*D. X triploidea* Wherry (*D. intermedia* X *spinulosa*) was located in Clayton Co. (Peck 80-620, ISTC) on a wooded slope of a bluff overlooking the Mississippi River at Point Ann, Pikes Peak State Park, T95N R3W S27, Mendon twp. Another population was located in Dubuque Co. (Peck 80-615, ISTC) at the base of a wooded slope at the Mines of Spain Preserve, T88N R3E S5, Mosalem twp. Both parents were present with the hybrid plants.

Two plants of *D. X bootii* (Tuckerm.) Underw. (*D. cristata* X *intermedia*) were located with their parental species at the base of a sandstone bluff in Allamakee Co.: Center twp., T98N R4W S14, Peck 80-627 (IA, ISC, ISTC). *D. X triploidea* was also discovered in Iowa at this locality, making it the only locality with two hybrid wood ferns in Iowa.

One plant of *D. X uliginosa* (A. Br.) Druce (*D. cristata* X *spinulosa*) was located with their parental species in a wet thicket on the floodplain of the Mississippi River at Green Island, Jackson Co.: T85N R6E S21, Peck 80-604 (IA, ISC, ISTC). This hybrid might be expected elsewhere in Iowa along wetlands in sites with sandy soils

and periodic flooding.

Hybrid *Dryopteris* taxa in North America outnumber species by slightly more than 2 to 1. The relative rarity of hybrid *Dryopteris* taxa in the Iowa flora probably reflects the restricted occurrence of the parent species, and consequently, the rarity of finding two species of woodferns together at a locality. The situation in Iowa contrasts markedly with that in Wisconsin (Peck and Taylor, 1980) and Michigan (Carlson, 1979) where *Dryopteris* species commonly occur together in large stands. In these states, the plants of hybrid origin may outnumber the plants of parental species, adding to the difficulties encountered when trying to comprehend the identity of woodferns. Additional localities with hybrid woodferns probably occur in eastern Iowa.

## COUNTY RECORDS

Vouchers for the 118 county records were identified by collector, collection number or date of collection, and the standard herbarium code (in parentheses) of the institution where a specimen was deposited.

*Adiantum pedatum* L.: Butler Co.: Peck 81-460 (ISTC). Clarke Co.: Peck 81-263 (ISTC). Grundy Co.: Peck 81-638 (ISTC). Humboldt Co.: Peck 81-638 (ISTC). Marshall Co.: Peck 81-447 (ISTC). Palo Alto Co.: Peck 81-647 (ISTC). Union Co.: Peck 81-269 (ISTC). Worth Co.: Peck 81-658 (ISTC).  
*Asplenium platyneuron* (L.) Oakes ex D. C. Eat.: Clayton Co.: Peck 80-622 (ISTC). Webster Co.: Peck 81-634 (ISTC).  
*Athyrium angustum* (Willd.) Presl: Clarke Co.: Peck 81-260 (ISTC). Dallas Co.: Peck 81-243 (ISTC). Hamilton Co.: Peck 81-630 (ISTC). Humboldt Co.: Peck 81-636 (ISTC). Madison Co.: Peck 81-245 (ISTC). Palo Alto Co.: Peck 81-645 (ISTC). Union Co.: Peck 81-265 (ISTC).  
*Athyrium thelypteroides* Desv.: Clinton Co.: Peck 80-599 (ISTC). Scott Co.: Peck 80-594 (ISTC).  
*Botrychium dissectum* Spreng. f. *dissectum*: Dubuque Co.: Peck 80-610 (ISTC). Fayette Co.: Lammers 4462 (ISTC). Jackson Co.: Peck 80-608 (ISTC). Winneshiek Co.: Peck 81-635 (ISTC).  
*Botrychium dissectum* Spreng. f. *obliquum* (Muhl.) Fern.: Black Hawk Co.: Lammers 3196 (ISTC). Fayette Co.: Lammers 4463 (ISTC). Webster Co.: Peck 81-635 (ISTC).  
*Botrychium multifidum* (Gmel.) Rupr.: Clayton Co.: Peck 80-621 (ISTC). Dubuque Co.: Peck 80-611 (ISTC).  
*Botrychium virginianum* (L.) Sw.: Benton Co.: Peck 81-458 (ISTC). Clarke Co.: Peck 81-261 (ISTC). Hamilton Co.: Roosa 5052 (ISTC). Hancock Co.: Peck 81-654 (ISTC). Jasper Co.: Peck 81-456 (ISTC). Palo Alto Co.: Peck 81-646 (ISTC). Pocahontas Co.: Peck 81-640 (ISTC). Union Co.: Peck 81-266 (ISTC).  
*Cryptogramma stelleri* Prantl: Muscatine Co.: Peck 80-572 (ISTC).  
*Cystopteris protrusa* (Weath.) Blasdel: Clarke Co.: Peck 81-262 (ISTC).

- Dallas Co.: Peck 81-242 (ISTC). Hancock Co.: Peck 81-653 (ISTC). Humboldt Co.: Peck 81-637 (ISTC). Jasper Co.: Peck 81-455 (ISTC). Kossuth Co.: Peck 81-641 (ISTC). Marshall Co.: Peck 81-449 (ISTC). Union Co.: Peck 81-268 (ISTC). Worth Co.: Peck 81-657 (ISTC).
- Cystopteris X tennesseensis* Shaver: Allamakee Co.: Peck 80-624 (ISTC). Dubuque Co.: Peck 80-617 (ISTC). Jackson Co.: Peck 80-607 (ISTC).
- Dryopteris cristata* (L.) Gray: Clinton Co.: Peck 81-422 (ISTC). Jackson Co.: Peck 80-602 (ISTC). Scott Co.: Peck 81-418 (ISTC).
- Dryopteris intermedia* (Muhl.) Gray: Clayton Co.: Peck 80-619 (ISTC). Winneshiek Co.: Peck 80-24 (ISTC).
- Dryopteris spinulosa* (O. F. Muell.) Watt: Jackson Co.: Peck 80-606 (ISTC).
- Dryopteris X bootii* (Tuckerm.) Underw.: Allamakee Co.: Peck 80-627 (ISC, ISTC, MICH).
- Dryopteris X triploidea* Wherry: Clayton Co.: Peck 80-620 (ISTC). Dubuque Co.: Peck 80-615 (ISTC).
- Dryopteris X uliginosa* (A. Br.) Druce: Jackson Co.: Peck 80-604 (ISC, ISTC, MICH).
- Equisetum fluviatile* L.: Black Hawk Co.: Lammers 4316 (ISC, ISTC). Clayton Co.: Peck 80-618 (ISTC). Fayette Co.: Peck 80-427 (ISTC). Jackson Co.: Peck 80-600 (ISTC). Winneshiek Co.: Peck 81-660 (ISTC).
- Equisetum laevigatum* A. Br.: Adair Co.: Peck 81-687 (ISTC). Adams Co.: Peck 81-690 (ISTC). Cass Co.: Peck 81-681 (ISTC). Clarke Co.: Peck 81-258 (ISTC). Decatur Co.: Peck 81-280 (ISTC). Ringgold Co.: Peck 81-285 (ISTC). Taylor Co.: Peck 81-695 (ISTC). Wayne Co.: Peck 81-275 (ISTC).
- Equisetum X ferrissii* Clute: Adair Co.: Peck 81-688 (ISTC). Adams Co.: Peck 81-691 (ISTC). Audubon Co.: Peck 81-677 (ISTC). Cass Co.: Peck 81-680 (ISTC). Clarke Co.: Peck 81-257 (ISTC). Decatur Co.: Peck 81-281 (ISTC). Guthrie Co.: Peck 81-679 (ISTC). Jasper Co.: Peck 81-454 (ISTC). Lucas Co.: Peck 81-270 (ISTC). Madison Co.: Peck 81-244 (ISTC). Page Co.: Peck 81-694 (ISTC). Pottawattamie Co.: Peck 81-675 (ISTC). Ringgold Co.: Peck 81-284 (ISTC). Taylor Co.: Peck 81-694 (ISTC). Warren Co.: Peck 81-247 (ISTC). Wayne Co.: Peck 81-274 (ISTC).
- Equisetum X litorale* Kuhlw.: Dickinson Co.: Peck 81-698 (ISTC). Jackson Co.: Peck 80-603 (ISTC).
- Lycopodium clavatum* L.: Allamakee Co.: Peck 80-265 (ISTC).
- Lycopodium lucidulum* Michx.: Jackson Co.: Peck 80-605 (ISTC).
- Matteuccia struthiopteris* (L.) Tod.: Clarke Co.: Peck 81-264 (ISTC). Kossuth Co.: Peck 81-643 (ISTC). Lucas Co.: Peck 81-255 (ISTC). Marshall Co.: Peck 81-450 (ISTC). Tama Co.: Peck 81-453 (ISTC). Worth Co.: Peck 81-656 (ISTC).
- Onclea sensibilis* L.: Boone Co.: Peck 81-628 (ISTC). Clarke Co.: Peck 81-259 (ISTC). Dickinson Co.: Peck 81-650 (ISTC). Kossuth Co.: Peck 81-644 (ISTC). Madison Co.: Peck 81-246 (ISTC). Union Co.: Peck 81-272 (ISTC). Wayne Co.: Peck 81-278 (ISTC).
- Osmunda claytoniana* L.: Benton.: Lammers 3970 (ISTC). Black Hawk Co.: Lammers 3890 (ISTC).
- Phegopteris connectilis* (Michx.) Watt: Allamakee Co.: Peck 80-626 (ISTC).
- Phegopteris hexagonoptera* (Michx.) Fee: Clinton Co.: Peck 80-597 (ISTC).
- Polystichum acrostichoides* (Michx.) Schott: Dubuque Co.: Peck 80-612 (ISTC).
- Pteridium aquilinum* (L.) Kuhn.: Louisa Co.: Peck 81-415 (ISTC).
- Selaginella rupestris* (L.) Spring.: Clinton Co.: Peck 81-423 (ISTC). Jackson Co.: Peck 80-609 (ISTC). Scott Co.: Peck 81-419 (ISTC).
- Thelypteris palustris* (Salisb.) Schott.: Dickinson Co.: Peck 81-649 (ISTC). Dubuque Co.: Peck 80-616 (ISTC). Emmet Co.: Peck 81-652 (ISTC). Jackson Co.: Peck 80-601 (ISTC). Marion Co.: C. Peck 18 Sept. 1980 (ISC).

## OBSERVATIONS ON RARE TAXA

Five species (*Botrychium simplex*, *Isoetes melanopoda*, *Marsilea vestita*, *Phegopteris connectilis*, and *Selaginella eclipes*) were recently considered possibly extirpated in Iowa (Peck, 1976b; 1989; Roosa and Eilers, 1978). They were known from one or two locations, but had not been observed recently, and in some cases, the known locality has been significantly impacted or degraded to the point that the persistence of the species was questionable. Efforts over the last decade to relocate these species as well as other rare Iowa pteridophytes have resulted in verification of old observations and the discovery of additional populations. Four of the five species considered possibly extirpated were located. Furthermore, six species and one hybrid (not considering the *Dryopteris* hybrids already discussed) of very rare occurrence in Iowa were also located in old and new localities. Observations are presented to clarify the presence and status of these species in Iowa.

*Botrychium multifidum* (Gmel.) Rupr. (Leather-leaved Grape Fern) was known from two collections in Allamakee Co., one collection in Fayette Co., and one collection in Winneshiek Co. The Fayette Co. collection was made by B. Fink in the 1890's. One of the Allamakee Co. collections was made by W. Tolstead in the 1930's, while the other Allamakee Co. collection and the Winneshiek Co. collection was made by T. Hartley in the late 1950's. None of the populations were relocated, however a new locality was discovered in Clayton Co. (Peck 80-621, ISTC, Mendon twp., Pikes Peak State Park, T95N, R3W S27) and in Dubuque Co. (Peck 80-611, ISTC, Mosalem twp., Mines of Spain Preserve, T88N R3E S15). This species is probably more abundant in northeastern Iowa than these few collections suggest. Based upon its distribution in the Driftless Area (Peck, 1982) and in Wisconsin (Peck and Taylor, 1980), additional plants might be located, especially at sites with native white pine stands or with dry sandy soils.

*Botrychium simplex* Hitchc. (Least Grape Fern) was collected by R. F. Thorne, R. L. Hulbary, and T. S. Cooperridge from a sandy pasture south of Coggen, Linn Co. (T86N R6W S27, Jackson twp.) in 1954. The species has not been observed since. The locality was disturbed by road construction in 1975, by dredging in the pond in 1976, and by random bulldozing in 1977. These impacts might have extirpated the species at this locality. On the other hand, another rare Iowa fern, *Ophioglossum vulgatum* L. var. *pseudopodium* (Blake) Farw. (Adder-tongue Fern) occurred at this locality and persisted through 1980. *B. simplex* is a rather small plant (1-3 cm above ground) which requires patient search on hands-and-knees. Two other small *Botrychium* species may occur in Iowa, based upon their occurrence in the Driftless Area (Hartley, 1965; Peck, 1982) and in Wisconsin (Peck and Taylor, 1980). *B. mormo* Wagner (Goblin Grape Fern) is similar to *B. simplex*, but is stouter, fleshy, and has sporangia deeply set into the frond. It emerges and sporulates later than *B. simplex* (Peck, 1980b; Wagner and Wagner, 1981). *B. matricariifolium* A. Br. ex Koch (Daisy-leaved Grape Fern) occurs at Wyalusing State Park, Grant Co., WI (Peck and Taylor, 1980) across from Clayton Co., IA. This plant has a more dissected frond than *B. simplex* and occurred on a high-humus, north-facing slope. It should occur in similar habitats in northeastern Iowa. Both *B. mormo* and *B. matricariifolium* require the same search method as that described for *B. simplex*.

*Dryopteris marginalis* (L.) Gray (Marginal Wood Fern) was known from three counties in Iowa. A Dubuque Co. locality (White Pine Hollow State Preserve, Liberty twp., T90N R2W S8) was discovered by B. Shimek in 1922, but has not been observed since, in spite of attempts by many workers. An Allamakee Co. locality near Postville was discovered by C. King and E. Orr in 1901, but has not since been relocated. There were at least five distinct populations of *D. marginalis* in Hardin Co., of which four were relocated (Peck, 1978). In 1981, a population of *D. marginalis* was located in Allamakee Co. (Peck 81-38, ISTC, T100N R4W S26, Iowa twp.) at the top of a limestone-

sandstone bluff at Kains Siding. *D. marginalis* was found for the first time in Minnesota some 30 km to the north of this locality in a similar habitat in 1981. Additional populations might also occur along bluffs of the Mississippi River or along the Upper Iowa River.

*Equisetum X litorale* Kuhlw. (*E. arvense* X *fluviatile*) was recently reported for Iowa from Allamakee Co. and Des Moines Co. (Peck, 1980a; 1980c; Peck, Roosa, and Eilers, 1980). The Allamakee Co. locality (Lansing Wildlife Refuge, T99N R4W S12) was the largest population (2-3 ha) of the hybrid known from North America. A subsequent survey of herbaria of states in the Upper Midwest demonstrated that the hybrid occurred along the Mississippi River and its tributaries in Illinois, Iowa, Minnesota, and Wisconsin (Peck, 1980c; 1982). The hybrid has been demonstrated to be well adapted to fluctuations in water level. Such impacts enhance its origin, persistence, and reproduction (Peck, 1980c). Two additional localities have since been discovered. One population was discovered near Green Island, Jackson Co. (Peck 80-603, ISTC, T85N R6E S21) on the floodplain of the Mississippi River. Both parents were present at this locality. The other population was located on the campus of Iowa Lakeside Laboratory, Lakeville twp. in Dickinson Co. (Peck 81-698, ISTC, T99N R37W S23). Both parents and the hybrid occurred in a seepage stream on the northeastern portion of the campus. The character of the seepage area has changed markedly in recent years (pers. comm., D. R. Farrar) as a result of beaver activity along the water course. Three clones of the hybrid were observed in 1981. These plants represent the northwestern-most locality of the hybrid in North America (Peck, 1982).

*Isoetes melanopoda* Gay & Dur. (Black-footed Quillwort; Prairie Quillwort) was first collected in Iowa by Vasey in 1863 in Clinton Co. This was only the 11th collection of the species in North America (Englemann, 1866). Pfeiffer (1922) monographed *Isoetes* and designated Vasey's Iowa specimens in GH and MO as isotypes. In doing so, she noted that Iowa material was represented by the typical variety and by forma *pallida*. The latter plants have pale sporophyll bases, while the typical variety has black bases, leading to the meaning of the specific epithet. Xerographic copies of the specimens deposited at MO were subsequently deposited at IA, ISC, and ISTC. Photographs of megaspores from Iowa specimens (MO) were included in a report on spore characteristics that differentiated between *I. melanopoda* and *I. butleri*, validating the identity of the Iowa material (Taylor, Mohlenbrock, and Murphy, 1975). *I. melanopoda* was not observed in Iowa after its first collection until plants were located on 13 June 1981 in Clinton Co. (Peck, 81-420, IA, ISC, ISTC, Comanche twp., T80N R6E S14/15). Eight plants were located in moist, sandy soils along US 67, just north of the Wapsipinnicon River, in the midst of *Eleocharis*, *Carex*, *Juncus*, and *Scirpus* vegetation. Sporophylls were already showing some degree of senescence, with all emergent leaves probably being withered by the end of June or beginning of July. Additional localities of this plant probably occur in Iowa along the Mississippi River and its tributaries where sandy habitats are periodically subjected to flooding.

*Lycopodium clavatum* L. (Running Clubmoss) was known from Iowa and Johnson counties. The original Johnson Co. locality has not been relocated, while the Johnson Co. population discovered in 1950 by R. V. Drexler was still extant in the 1970's (pers. comm., R. V. Drexler). The Iowa Co. locality (Iowa twp., T80N R9W S2) was first noted in 1972. Since then, inspections on an almost annual basis have not suggested that the population of *L. clavatum* is changing appreciably at this locality. A fourth locality of *L. clavatum* was discovered in Allamakee Co. (Peck 80-625, ISTC; Iowa twp., T100N R4W S34). The population occurred along a sandy road-cut with slight seepage. The habitat of the Iowa Co. and the Allamakee Co. localities were quite similar in appearance. The Driftless Area distribution (Peck, 1982) and Wisconsin distribution (Peck and Taylor, 1980) suggests that other populations might occur elsewhere in eastern Iowa. The

persistence of *L. clavatum* at the Iowa Co. locality contrasts markedly with the striking decline of *L. digitatum* A. Br. (Crowfoot Clubmoss) at the same locality. This latter species was known as *L. complanatum* L. var. *dendroideum* (Michx.) D. C. Eat. ex A. Gray (Cooperrider, 1959) and *L. dendroideum* Michx. (Peck, 1976b). However, Hickey and Beitel (1979) have recently demonstrated that the correct name for this species is *L. digitatum*. The decline of *L. digitatum*, but persistence of *L. clavatum*, at this locality raises questions as to what factors contributed to differential success and how mixed populations of rare plants should be managed.

*Marsilea vestita* Hook. and Grev. (Hairy Pepperwort) occurred throughout the Great Plains, but it was known from Iowa from only one locality in Lyon Co. B. Shimek first collected it in 1899; M. Grant recollected the species at the same locality in 1963 (Grant 14844, ISTC, Sioux twp., T100N R48W S7). Since then, the locality had been used as a hog lot and pasture, and the species was thought to have been extirpated (Peck, 1976b). In June 1980, Shimek's locality was visited two days after intense rains. *M. vestita* was located adjacent to Sioux Quartzite rocks in a wallow (Peck 80-120, ISTC; Peck 80-193, ISC), in spite of extensive agricultural impacts. Five sporophyte clones were observed, with each clone from 5 to 40 cm in diameter. Twenty-seven sporocarps were observed discharging sorophores into the ephemeral water. Although the future of these plants was uncertain, their persistence at this locality since 1899 suggests that the species has remarkable staying power.

*Osmunda cinnamomea* L. (Cinnamon Fern) was collected from a single site in each of five Iowa counties (Clayton, Delaware, Henry, Jackson, and Muscatine), but was extant at only the Muscatine Co. locality (Lake twp., T77N R2E S7). The locality was used as a summer pasture for dairy cattle. The approximately 50 plants in the population were concentrated at the edge of hanging bogs. Its rarity in Iowa contrasts with its occurrence in nearly every county in Wisconsin (Peck and Taylor, 1980), suggesting that other populations might still be located in eastern Iowa, especially along sandy seepage areas.

*Osmunda regalis* L. (Royal Fern) was collected from a single locality in each of four counties (Allamakee, Cedar, Clinton, and Delaware) and two localities in Muscatine Co. Of these five populations, only one was extant (Cedar Co., Rochester twp., T79N R2W S31/30 and T79N R3W S25/26). At this locality, nearly one thousand plants were present, representing all size classes, but apparently having been produced by vegetative reproduction. Sporeling plants from sexual reproduction were not observed. *O. regalis* once occurred at the extant locality of *O. cinnamomea* discussed above, according to notes taken by F. Reppert in 1891. Reppert also noted that the plants were being trampled by cattle. Apparently, the *O. regalis* was extirpated by cattle, but the *O. cinnamomea* plants persisted. *O. regalis*, like *O. cinnamomea*, was very rare in Iowa, but occurs in nearly every county in Wisconsin (Peck and Taylor, 1980). Searches for additional populations of this fern should be conducted along the sandy soils adjacent to Iowa's rivers in the eastern one-third of the state.

*Pellaea atropurpurea* (L.) Link (Purple Cliff-brake Fern) was known in Iowa from three localities in Allamakee Co. and one locality in Van Buren Co. All Allamakee Co. localities were discovered since 1950, with one locality being state owned (New Albin Wildlife Area, Iowa twp., T100N R4W S22). The Allamakee Co. populations are part of the disjunct, northern populations of *P. atropurpurea* that occur in the Driftless Area along the Mississippi River and Wisconsin River (Peck, 1982; Peck and Taylor, 1980). The Van Buren Co. locality occurs at the northern edge of the species' metropolitan range to the south of Iowa. This locality was discovered in 1930 at Lacey-Keosauqua State Park by E. W. Graves. Graves revisited the locality in 1932 (specimens at ISC and MIN). The Van Buren Co. population was thought to have been extirpated (Cooperrider, 1959; Peck, 1976b), but was subsequently relocated by D. M. Roosa and the author in 1979. Approximately 50 plants were observed. The absence of this species in

Iowa between Van Buren and Allamakee counties seems anomalous, but searches for it along bluffs of the Mississippi River have not located any other populations. Specimens collected by Roosa and Peck of the Allamakee and Van Buren county populations were deposited at ISTC.

*Phegopteris connectilis* (Michx.) Watt (Narrow Beech Fern) was collected in Iowa in 1880's in Delaware Co. and Muscatine Co. Efforts to relocate this species in Iowa have not been successful in these counties. A population of *P. connectilis* was recently discovered in Allamakee Co. on a north-facing sandstone bluff under white pines along Waterloo Creek (Peck 80-626, ISTC, Waterloo twp., T100N R6W S14). One plant with four fronds was observed. Additional populations probably occur in Iowa at similar habitats, since the species occurs in nearly every county in Wisconsin (Peck and Taylor, 1980) at similar habitats. The species can readily establish new populations, since it forms sporophytes from gametophytes apogamously, resulting in a single spore being able to form a sporophyte without fertilization. This species might still be present where previously collected at Wild Cat Den State Park, Muscatine Co., and Backbone State Park, Delaware Co.

*Selaginella eclipses* Buck (Northern Meadow Spikemoss) was collected at a single locality in Iowa in 1958 by R. E. Thorne and R. L. Hulbarry (Muscatine Co., Lake twp., T78N R3W S15). The locality has since been ditched, drained, and put into rowcrops in 1959, leading to the species being considered extirpated in Iowa. In 1975, the locality was inspected by the author. The species was found to persist in unplowed blue grass pasture in wet, sandy soil as a 1-2 m wide strip 200 m long at the base of a sandy slope. The population was fertile in 1975, whereas spore production was not evident in specimens collected in 1958. The Iowa population was reported as *S. apoda* by Cooperrider (1959) and by Peck (1976b). Buck (1977) recognized plants from the Great Lakes southwestward to Arkansas as *S. eclipses*, in that they differed in leaf and spore morphology from *S. apoda* from the southeastern United States. Iowa material was subsequently re-examined and reported as *S. eclipses* (Peck and Buck, 1978). The Iowa population is the most northwestern station of this species in the *S. apoda* complex in North America.

### SUMMARY

Cooperrider (1959) reported 53 species of pteridophytes in Iowa. Since then, additional field work and herbarium study has resulted in state and county records being recognized, as well as, the accumulation of numerous changes in nomenclature which require amending the Iowa literature. Presently, the Iowa pteridophyte flora consists of 57 species, 7 hybrids, and one species (*Botrychium dissectum*) with two distinct forms. There are now 1450 county records supporting the present flora, 30% of which were added since 1970. The manual by Cooperrider (1959) no longer adequately reflects the distributional information of Iowa pteridophytes, is out-of-date in terms of nomenclature, and is out-of-print. A new treatment with keys and descriptions is needed. Until a new manual is prepared, the manuals of Wherry (1961) and Mickel (1979) are recommended to accompany this and earlier reports by Peck.

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