Series Preface

The purpose of the four books in the Aquatic and Standing Water Plants of the Central Midwest series is to provide illustrated guides to plants of the central Midwest that may live at least three months a year in water, though a particular plant may not necessarily live in standing water during a given year. The states covered by these guides include Iowa, Illinois, Indiana, Ohio, Kansas, Kentucky, Missouri, and Nebraska, except for the Cumberland Mountain region of eastern Kentucky, which is in a different biological province. Since 1990, I have taught week-long wetland plant identification courses in all of these states on several occasions.

The most difficult task has been to decide what plants to include and what plants to exclude from these books. Three groups of plants are within the guidelines of these manuals. One group includes those aquatic plants that spend their entire life with their vegetative parts either completely submerged or at least floating on the water's surface.

This group includes obvious submerged aquatics such as *Ceratophyllum*, the Najadaceae, the Potamogetonaceae, *Elodea, Cabomba, Brasenia, Nymphaea*, some species of *Ranunculus, Utricularia*, and a few others.

Plants in a second group are called emergents. These plants typically are rooted under water, with their vegetative parts standing above the water surface. Many of these plants can live for a long period of time, even their entire life, out of the water. Included in this group are *Sagittaria, Alisma, Peltandra, Pontederia, Saururus, Justicia*, and several others.

The most difficult group of plants that I had to consider is made up of those wetland plants that live most or all of their lives out of the water, but which on occasion can live at least three months in water. I concluded that I would include within these books only those species that I personally have observed in standing water for at least three months during a year, or which have been reported in the literature as living in standing water.

In this last group, for example, I have included *Poa annua*, since Yatskievich, in his *Steyermark's Flora of Missouri* (1999), indicates that this species may occur in standing water, even though I have not observed this myself. I have included most plants of bogs, fens, and marshes if I have observed these plants actually to be in water.

It is likely that I failed to include some plants that should have been included, but that I had not observed myself.

The nomenclature I have used in these books reflects my own opinion as to what I believe the scientific names should be. If these names differ from those used by the U.S. Fish and Wildlife Service, I have indicated this. A partial list of synonymy is included for each species, particularly accounting for synonyms that have been in use for several decades.

After the description of each plant, I have indicated the habitats in which the plant may be found, followed by the states in which the plant occurs. I have indicated the U.S. Fish and Wildlife wetland designation for each species for the

states that each occurs in. In 1988, the National Wetlands Inventory Section of the U.S. Fish and Wildlife Service attempted to give a wetland designation for every plant occurring in the wild in the United States. The states covered by these aquatic manuals occur in three regions of the Fish and Wildlife Service. Kentucky and Ohio are in region 1; Illinois, Indiana, Iowa, and Missouri are in region 3; and Kansas and Nebraska are in region 5. Definitions of the Fish and Wildlife Service wetland categories are:

OBL (Obligate Wetland). Occur almost always under natural conditions in wetlands, at least 99% of the time.

FACW (Facultative Wetland). Usually occur in wetlands 67%–99% of the time), but occasionally found in non-wetlands.

FAC (Facultative). Equally likely to occur in wetlands or non-wetlands 34%–66% of the time.

FACU (Facultative Upland). Usually occur in non-wetlands 67%–99% of the time, but occasionally found in wetlands.

UPL (Upland). Occur in uplands at least 99% of the time, but under natural conditions not found in wetlands.

NI (Not Indicated). Due to insufficient information.

A plus or minus sign (+ or -) may appear after FACW, FAC, and FACU. The plus means leaning toward a wetter condition; the minus means leaning toward a drier condition.

Although the Fish and Wildlife Service made changes to the wetland status of several species in an updated version in 1997, this later list has never been approved by Congress.

Following this is one or more common names currently employed in the central Midwest. A brief discussion of distinguishing characteristics and nomenclatural notes is often included. Illustrations accompany each species, showing the diagnostic characteristics. In some of the illustrations, a gap in the stem signifies that a portion of the stem has been omitted due to space limitations.

The sequence of families in these aquatic manuals is as follows:

1. Azollaceae
2. Blechnaceae
3. Equisetaceae
4. Isoetaceae
5. Lycopodiaceae
6. Marsileaceae
7. Onocleaceae
8. Osmundaceae
9. Thelypteridaceae
10. Pinaceae
11. Taxodiaceae
12. Acoraceae
13. Alismataceae
14. Araceae
15. Butomaceae
16. Cyperaceae
17. Eriocaulaceae
18. Hydrocharitaceae
19. Iridaceae
20. Juncaceae
21. Juncaginaceae
22. Lemnaceae
23. Maranthaceae
24. Najadaceae
25. Orchidaceae
26. Poaceae
27. Pontederiaceae
28. Potamogetonaceae
29. Ruppiaceae
30. Scheuchzeriaceae
31. Sparganiaceae
32. Typhaceae
33. Xyridaceae
34. Zannichelliaceae
35. Acanthaceae
36. Aceraceae
37. Amaranthaceae
38. Anacardiaceae
39. Apiaceae
40. Apocynaceae
41. Aquifoliaceae
42. Asclepiadaceae
43. Asteraceae
44. Balsaminaceae
45. Betulaceae

46. Boraginaceae
47. Brassicaceae
48. Cabombaceae
49. Caesalpiniaceae
50. Callitrichaceae
51. Campanulaceae
52. Caprifoliaceae
53. Ceratophyllaceae
54. Cornaceae
55. Cuscutaceae
56. Elatinaceae
57. Ericaceae
58. Escalloniaceae
59. Fabaceae
60. Gentianaceae
61. Grossulariaceae
62. Haloragidaceae
63. Hippuridaceae
64. Hypericaceae
65. Juglandaceae
66. Lamiaceae
67. Lauraceae
68. Leitneriaceae
69. Lentibulariaceae
70. Lythraceae
71. Malvaceae
72. Menyanthaceae
73. Myricaceae
74. Nelumbonaceae
75. Nymphaeaceae
76. Nyssaceae
77. Oleaceae
78. Onagraceae
79. Parnassiaceae
80. Plantaginaceae
81. Podostemaceae
82. Polemoniaceae
83. Polygonaceae
84. Primulaceae
85. Ranunculaceae
86. Rhamnaceae
87. Rosaceae
88. Rubiaceae
89. Salicaceae
90. Sarraceniaceae
91. Saururaceae
92. Saxifragaceae
93. Scrophulariaceae
94. Solanaceae
95. Styracaceae
96. Ulmaceae
97. Urticaceae
98. Valerianaceae
99. Verbenaceae
100. Violaceae

This volume consists of families 1–15 and 17–34. A previous volume has covered family 16, the Cyperaceae. The dicots are also in two volumes, the first covering families 35–73, the second covering families 74–100.