

Book review

Aquatic and wetland plants of northeastern North America

Volume 1. Pteridophytes, gymnosperms, and angiosperms: dicotyledons, lv + 480 pp., ISBN 0-299-16330-X, US\$ 90.00, cloth, Volume 2. Angiosperms: monocotyledons, lv + 400 pp., ISBN 0-299-16280-X, US\$ 90.00, cloth, G. E. Crow and C. Barre Hellquist, The University of Wisconsin Press, Madison, Wisconsin, 2000

Crow and Hellquist have provided what every aquatic botanist in the northeast has eagerly awaited for more than half a century — a revised treatment of Fassett's classic "manual" of aquatic plants. This completes the full geographical circle of major floristic publications on the aquatic plants of the United States that began with "A manual of aquatic plants" (Fassett, 1940) covering the region "from Minnesota to Missouri and eastward to the Gulf of St. Lawrence and Virginia" (Fassett, 1940).

The first inclusive work for the USA "Aquatic plants of the United States" was added shortly afterwards (Muenscher, 1944). Rather than expand Muenscher's treatment, Mason (1957) began what developed into a series of more detailed, regional aquatic floras with his "A flora of the marshes of California". Soon to follow were "Aquatic plants of the Pacific Northwest" (Steward, Dennis and Gilkey, 1963), "Aquatic and wetland plants of southwestern United States" (Correll and Correll, 1972), "Aquatic and wetland plants of southeastern United States" (Godfrey and Wooten, 1979; 1981) and "Aquatic and wetland vascular plants of the northern Great Plains" (Larson, 1993) as well as other more local floristic treatments. Thus, even though Fassett provided the first regional treatment of aquatic plants in the USA, it had become seriously outdated and overshadowed by these more recent and inclusive treatments. The addition of a "Revision Appendix" to the "manual" (written by E. Ogden in 1957) helped to correct some errors, but still fell substantially short of a revision that would be on par with the updated, comprehensive, regional aquatic floras.

Although in my experience, the keys and nomenclature of the old "manual" had to be annotated lavishly before it could be used instructionally (using the revision appendix and other necessary corrections), an appealing feature of the original book has always been its excellent use of diagrams and illustrations. Fortunately, this feature is not only retained but also greatly expanded in the present book, with many of the useful, familiar illustrations making their timeless reappearance in Crow and Hellquist's revision. To these have been added numerous illustrations carefully selected from the aforementioned works and other appropriate sources. The result is an incredibly well-illustrated work that will be a welcome tool to those attempting to pursue the many challenges of water plant identification. There is now an actual map to show the geographical coverage of the book.

Given how important are the drawings in a book of this type, I was surprised to see a mediocre quality of printing used in their reproduction. I found that many of the illustrations were printed poorly, with broken and overly light or dark print that compromised the resolution of the original drawings. The quality of identical illustrations is superior in the original manual. I found this to be unusual given that the same publisher has printed these illustrations, arguably with the assistance of modern technology. Some bad examples in my copy were: 18-a: the illustration of *Myriophyllum tenellum* which looked to have hair rather than leaves; 342-h: where the achene surface simply looked black; 352-b: which had low contrast; 424-a: where individual florets of *Juncus validus* could not be discerned, and 424-d: where the seed reticulations cannot be made out. All drawings are reproduced badly for figure 316, and it is difficult to discern anything about the structure of the inflorescence in 316-g, *Senecio aureus*. It is impractical to include figures if the features are not discernible. Most of the figures are presentable, but the clarity of many could be improved.

Both authors are proficient aquatic plant taxonomists and have contributed equally of their expertise. According to the preface, the authorship sequence was determined via a coin toss mediated by Gordon Tucker (known for his work on Cyperaceae). Many other experts were consulted during the preparation of this work (more than 30 are acknowledged), which helped to ensure reliable taxonomic treatments of all included groups. The amount of work and patience that went into this work is incredible. I remember looking over draft sections of this book while still a graduate student at Ohio State in the early 1980s, hoping that it would soon be published. Nearly 20 years later, that wish has finally materialized.

Superficially, there is no comparison to the original “manual” even though the present work has been published by the same press and bears the familiar UW trademark on the spine. A two-column format is used throughout for taxon listings. There are now two volumes that provide 59% more pages of information (990 pp. versus 405 pp. in the previous revised edition) making it over twice as long as the original (but see comments on redundancy below). Each volume is also bigger physically in an 8.75 in. × 11.25 in. format that is 41% larger than the original manual. You would not be lugging these babies around with you in the field! However, if you still have visions about dragging these books through the swamp, the price might present another deterrent. At US\$ 180 for the present set, one might instead prefer to sacrifice six copies of the original manual (still available at US\$ 30) to the bog beasts. However, I presume the original edition will soon be out-of-print permanently.

Unfortunately, the size and price of the new manual preclude its use as a textbook, especially for a field course. Despite the availability of this comprehensive treatment, I am still using the original manual as a textbook for my Aquatic Plant Biology course this fall. Yet, in fairness, I do not often see people taking copies of the Corrells’ or Godfrey and Wooten’s hefty treatments into the field with them either. As is the case with those aquatic floras, this is definitely a reference book rather than a field guide, as was its predecessor.

Gone is the textured cloth cover of the more recent printings in favor of slick laminated boards, appropriately cast in the light blue color of water (ironically, the older printings are usually done in various shades of green which actually might be more appropriate for the water color typically encountered nowadays). *Megalodonta beckii* has been replaced on the cover with two of the authors’ own illustrations — *Brasenia schreberi* (Vol. 1) and *Potamogeton praelongus* (Vol. 2). This means, I will have to change the question on my Aquatic Plant Biology exam concerning “Which plant is pictured on the cover of Fassett’s

manual?”. Although, I am not sure that anybody ever knew the answer, this will make it twice as difficult.

The increase in pages and size is a function of the expanded coverage of plants. There are now 1186 taxa included (versus 752 in old edition: a 37% increase), and also many new illustrations added. Species of salt marshes and bogs have been greatly expanded. There is an enhanced “pteridophyte” coverage which is up-to-date and adopts nomenclature from recent Flora of North America published volumes. The gymnosperms have been expanded from one species (*Taxodium*) to five, although, it still does not include white pine (*Pinus strobus*) which, aside from its reputation as an upland species, often grows in bogs, sometimes in significant numbers. Important graminoid wetland genera have also been expanded such as *Carex* which includes 76 spp. compared to 29 spp. in the previous edition. The few algae and bryophytes treated in the previous manual are excluded entirely. The rank of ‘forma’ is excluded in all the groups. I was somewhat surprised to find that the authors provide no definition of aquatic plant in the introduction. In the glossary, ‘aquatic’ is simply defined as “living in water”.

The publisher did not use a paper saving format. The first 55 pages are redundant in each volume. Also redundant are the list of abbreviations (2 pp.), glossary of plant terms (10 pp.), glossary of habitat terms (2 pp.) and index (28 pp.) for a total of 97 pages of duplicated information (nearly 10% of total!). In addition I counted 17 completely blank pages. The redundant general key and glossaries provide that each volume can “stand alone”, but this feature consumes quite a bit of space and is not used in comparable floristic treatments. It is possible that many people will purchase only a single volume; the cost of the complete set could encourage that. Certainly the inclusion of the section on nuisance aquatic plants of the northeast could have been limited to the first volume.

There is still a key to “General Keys”, but thankfully, it is now strictly dichotomous! This introductory key leads to eight specialized keys to various groups. All keys lead logically to families (volume and page numbers are provided), and there is no longer any annoying jumping around to the middle of other keys such as was the format in the original manual. I do not know how many times I had to correct students using the old manual who invariably would follow a lead to the top of a page rather than to the couplet indicated (e.g. “5, p. 6”). Thank goodness that was fixed!

The taxonomic keys are indented throughout as compared to the bracketed format used in the old manual. I am happy to see the indented format adopted, because it helps students visualize similar taxa as they are grouped together. Names of taxa are aligned at the right margin for easy location and include sequential reference numbers to the accompanying text treatment. This is a blessing to anyone who knows how difficult it was to locate species names in the earlier manual. This feature also makes it simple to count the numbers of taxa in each family or genus. Also, keyed names have been separated from descriptions and distributional data unlike the earlier manual. This convention is much nicer and easier to use.

I tried several of the keys, and found them to be excellent and workable. All couplets contain parallel leads without overlapping character states. Vegetative keys are provided to some groups (e.g. *Salix*), and are a welcome preference over keys that are usually biased by reproductive features. Some keys (even for Lemnaceae, the world’s smallest flowering plants) use vegetative characters entirely. The conscientious efforts of the authors to

incorporate vegetative features whenever possible continues the precedent set by Fassett and results in a highly “user-friendly” and effective text.

As in the original manual, intervening plates of illustrations break up many keys. I have always found this to be awkward, especially when one needs to flip back and forth to compare different parts of the key. Discontinuities of this sort ranged from single pages (*Alnus*, *Apiaceae*, *Asclepias*, *Hibiscus*, *Lemna*, *Orchidaceae*, *Poaceae*, *Polygonum*, *Salix*, *Solidago*) to keys interrupted by two (*Gratiola*, *Hypericum*, *Nuphar*, *Potamogeton*, *Poa*, *Rosaceae*, *Stuckenia*, *Paspalum*, *Panicum*), three (*Glyceria*, *Pluchea*, *Potentilla*, *Stachys*), and four (*Drosera*, *Sagittaria*, *Rhynchospora*) pages. The worst offenders were keys for *Cyperus*, *Rhexia* and *Hydrocharitaceae* that were interrupted by 9, 15, and 16 pages, respectively. This factor makes the keys difficult to use. Perhaps this problem could be rectified in later printings. Happily, some fairly sizeable keys (*Eleocharis*, *Scirpus*, *Juncus*, *Carex*; 3–5 pp. long) are uninterrupted in their entirety.

As in the precursor, common names and authors for scientific names are provided. I caught one error for “*Neobeckia aquatica* (Eat.) Britt.” (p. 148) which is actually a Greene rather than Britton combination.

A section on nuisance aquatic plants of the northeast is newly added, and reflects the current emphasis on invasives and their origin. However, sections on “Use of aquatic plants by birds and mammals” and “The relation of plants to fish” have been omitted. I found those to be useful in the previous edition, but they were highly outdated and would have required extensive revision. There is also a new “Glossary of habitat terms” which helpfully defines 64 habitat terms. There is a much expanded glossary (582 terms versus 128 terms in the old edition) and a full list of abbreviations.

I am fussy about definitions and some of these could be improved. The following are taken exactly from old edition: alternate: parts borne with but one at each *level* of the stem; whorled: arranged in a circle at one *level* on the stem. Why not use the term ‘node’ rather than level? It is defined in the glossary. The definition of ‘opposite’ has been modified in this way: two at a *node* on opposite sides of the stem (also for flower parts one in front of another). Most of the definitions are fine. I noticed that the term drupelet is misspelled as ‘druplet’ in the glossary (p. 355), but it is spelled correctly when used elsewhere in the text.

Although, “spatial constraints” influenced reference selection (p. xi), it is still a very good selection (7 pp. in Vol. 2; 10 pp. in Vol. 1). The inclusion of separate “References” sections at the back of each volume is a vast improvement over citations embedded within the text as in the old manual. The references are not duplicated in the different volumes with each having citations pertaining to the volume in hand. I like the feature of being able to look up references in each volume rather than having to wade through a single, longer list as in many two-volume books. It is unclear, why some references were listed under family but not genus (e.g. *Potamogeton*, *Potamogetonaceae*), some under genus but not family (e.g. *Vallisneria*, *Hydrocharitaceae*), or both under family and genus (e.g. *Alisma*, *Alismataceae*). Most citations were reasonably complete; however, the reference under *Eleocharis* to “Svenson, 1932” only covers series *Palustriformis*. It seems like an oversight that Svenson’s four other parts on this genus were not mentioned (as they were included in the original manual).

So, if you are working on aquatic plants in the northeastern United States (or anywhere else for that matter), you must obtain a copy of this excellent treatment. Aside from its

disappointing figure reproduction and a few format problems, this is an absolutely essential reference for aquatic plant identification. Yes, it is a bit pricey, but rings true of the adage “You get what you pay for”. In this case, it means you will obtain a rich body of knowledge which reflects the amalgamation of decades of taxonomic prowess. In turn, this also means that you will be able to identify aquatic plants readily in the northeastern region. Crow and Hellquist are to be warmly congratulated for their outstanding achievement and endurance in preparing this work. With a little luck, maybe we can talk them into tackling the hydrophytes of Canada next!

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