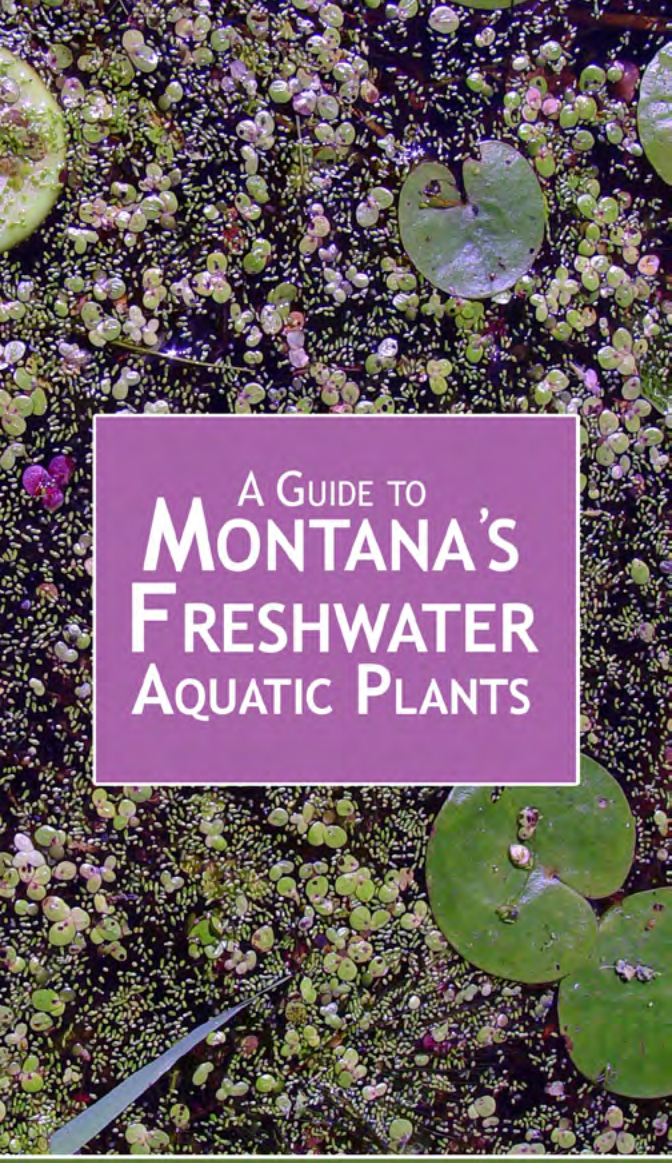

A Guide to Montana's Freshwater Aquatic Plants

TABLE OF CONTENTS

Cover photo: Arthur Haines, New England Wild Flower Society

TABLE OF CONTENTS

ACKNOWLEDGMENTS

We would like to thank the Washington Department of Ecology along with Jenifer Parsons and Kathy Hamel for granting permission to adapt the text in this guidebook from their publication *An Aquatic Plant Identification Manual*. We would also like to thank Amy Richard and the entire staff at the University of Florida Center for Invasive Species for their generous contribution of pen and ink drawings and photographs, Jill Weber at the New England Wild Flower Society for allowing the use of numerous photographs, as well as Joe Marcus at the Lady Bird Johnson Wildflower Center for granting the use of photographs, along with Gerald Carr at the University of Oregon for his photographs, and all of the other contributors who so graciously provided photographs, editing assistance, and time to help compile this guidebook.

DESIGN & LAYOUT
Angie DeYoung, Montana Department of Agriculture

TECHNICAL REVIEW
Peter Lesica, Missoula, Montana
Pete Husby, NRCS, Bozeman, Montana

EDITORIAL
Craig McLane, Montana Department of Agriculture
Jane Mangold, Montana State University

PROJECT COORDINATION

Shantell Frame-Martin
Montana Noxious Weed Education Campaign
Montana Department of Agriculture
PO Box 200201
Helena, MT 59620-0201
406-444-9491
sframe-martin@mt.gov
http://agr.mt.gov/agr/Programs/Weeds/MTNWEC/

COPIES

To request copies, please contact:

Montana Department of Agriculture
302 N. Roberts
Helena, MT
59620-0201
Dburch@mt.gov
406-444-3140

COST

This guidebook was developed through a collaborative effort between the Montana Noxious Weed Education Campaign, its Executive Committee Members, and the Montana Department of Agriculture. This publication was printed with grant funds received through the Montana Noxious Weed Trust Fund, the U.S. Department of the Interior Montana/Dakotas Bureau of Land Management, and the U.S. Forest Service, Region 1.

ILLUSTRATION CREDITS

The following illustrations have been reprinted with permission from the following sources:

Center for Aquatic Invasive Plants, Institute of Food & Agricultural Sciences , the University of Florida. ***Brasenia schreberi*****,** ***Butomus umbellatus*****,** ***Ceratophyllum demersum*****,** ***Chara spp.*****,** ***Egeria densa*****,** ***Hydrilla verticillata*****,** ***Iris pseudacorus*****,** ***Lemna spp.*****,** ***Lythrum salicaria*****,** ***Myriophyllum spicatum*****,** ***Najas guadalupensis*****,** ***Nitella*****,** ***Nymphaea odorata*****,** ***Potamogeton crispus*****,** ***Potamogeton richardsonii*****,** ***Spirodela polyrrhiza*****,** ***Wolffia spp***.

Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database/USDA NRCS. 1995. Northeast wetland flora: Field office guide to plant species. Northeast Technical Center, Chester. ***Najas flexilis***

USDA-NRCS PLANTS Database/Britton, N.L., and A. Brown. 1913. An Illustrated flora of the northern United States, Canada and the British Posessions. 3 vols. Charles Schribner's Sons, New York. ***Alisma triviale*** (Vol. 1:94), ***Elodea nuttallii*** (Vol. 1:105), ***Heteranthera dubia*** (Vol. 1:464), ***Hippuris vulgaris*** (Vol. 2:612), ***Megalodonta beckii*** (Vol. 3:500), ***Potamogeton illinioensis*** (Vol. 1:79), ***Potamogeton filiformis*** (Vol. 1:86), ***Potamogeton foliosus*** (Vol. 1:82), ***Potamogeton natans*** (Vol. 1: 75), ***Potamogeton nodosus*** (Vol. 1:77), ***Potamogeton obtusifolius*** (Vol. 1:82), ***Potamogeton pectinatus*** (Vol. 1:87), ***Potamogeton pusillus*** (Vol. 1:84), ***Potamogeton robbinsii*** (Vol. 1:87), ***Potamogeton vaginata*** (Vol. 1: 87), ***Potamogeton zosteriformis*** (Vol. 1:81), ***Ruppia maritima*** (Vol. 1:88), ***Sagittaria cuneata*** (Vol. 1:99), ***Sagittaria latifolia*** (Vol. 1:99), ***Utricularia minor*** (Vol. 3:228), ***Utricularia vulgaris*** (Vol. 3:229).

USDA-NRCS PLANTS Database/USDA NRCS. Wetland flora: Field office illustrated guide to plant species. USDA Natural Resources Conservation Service. ***Callitriche hermaphroditica*****,** ***Callitriche heterophylla*****,** ***Callitriche palustris*****,** ***Elodea Canadensis*****,** ***Limodella aquatica*****,** ***Myriophyllum verticillatum*****,** ***Nasturtium-officinale*****,** ***Nuphar polysepala*****,** ***Polygonum amphibium*****,** ***Potamogeton amplifolius*****,** ***Potamogeton gramineus*****,** ***Potamogeton praelongus*****,** ***Ranunculus aquatilis***

PHOTOGRAPHY CREDITS

Photographs are reprinted with permission of the following photographers:

Barry Breckling. ***Elatine rubella***

Center for Aquatic Invasive Plants, Institute of Food & Agricultural Sciences , the University of Florida. ***Brasenia schreberi*****,** ***Chara spp. closeup*****,** ***Chara spp. plant form*****,** ***Egeria densa plant form*****,** ***Egeria densa*** (leaves), ***Hydrilla verticillata*** (tubers), ***Hydrilla verticillata*** (leaves), ***Iris pseudacorus*** (stem), ***Lythrum salicaria*****,** ***Potamogeton illinoensis*** (plant form), ***Potamogeton illinoensis*** (leaves), ***Potamogeton richardsonii*** (leaves), ***Potamogeton richardsonii*** (plant form), ***Spirodella polyrrhiza*****,** ***Wolffia spp***.

Donald Cameron, Maine Natural Areas Program. ***Callitriche heterophylla*****,** ***Callitriche palustris*****,** ***Ceratophyllum demersum*****,** ***Elodea Canadensis*** (leaves), ***Elodea Canadensis*** (plant form), Elodea nuttallii (plant form), ***Heteranthera dubia*****,** ***Hippuris vulgaris*** (plant form), ***Hippuris vulgaris*** (flower), ***Lemna minor*****,** ***Megalodonta beckii*****,** ***Myriophyllum sibiricum*** (leaves), ***Myriophyllum sibiricum*** (flowers & fruits), ***Myriophyllum spicatum*** (leaves), ***Myriophyllum spicatum*** (plant form), ***Myriophyllum verticillatum*** (leaves), ***Myriophyllum verticillatum*** (flowers & fruit), ***Najas flexilis*****,** ***Najas guadalupensis*****,** ***Polygonum amphibium*** (flowers & fruits), ***Polygonum amphibium*** (plant form), ***Potamogeton amplifolius*****,** ***Potamogeton crispus*** (leaves), ***Potamogeton crispus*** (plant form), ***Potamogeton filiformis*** (plant form), ***Potamogeton gramineus*****,** ***Potamogeton natans*** (fruits & flowers), ***Potamogeton obtusifolius*****,** ***Potamogeton pectinata*** (plant form), ***Potamogeton praelongus*****,** ***Potamogeton pusillus*****,** ***Potamogeton robbinsii*****,** ***Potamogeton zosteriformis*****,** ***Ranunculus aquatilis*** (leaves), ***Ranunculus aquatilis*** (stem & flower), ***Ruppia maritima*****,** ***Sagittaria cuneata*** (leaves), ***Sagittaria cuneata*** (flower), ***Sagittaria latifolia*** (leaves), ***Sagittaria latifolia*** (flower), ***Utricularia minor*** (plant form), ***Utricularia macrorhiza*** (plant form), ***Zannichellia palustris***.

Gerald D. Carr, University of Oregon. ***Limosella aquatica*** (plant form), ***Limosella aquatica*** (flower), ***Potamogeton foliosus***

Arthur Haines, New England Wild Flower Society. ***Alisma triviale*****,** ***Callitriche stagnalis*****,** ***Iris pseudacorus*****,** ***Nasturtium officinale*****,** ***Potamogeton natans*** (plant form), ***Utricularia macrorhiza*** (flower), ***Wolffia*** spp. (cover photo)

Peter Lesica. ***Nuphar lutea spp. polysepala*** (plant form), ***Nymphaea odorata*** (plant form), ***Tamarix ramosissima***

Campbell & Lynn Loughmiller, Lady Bird Johnson Wildflower Center. ***Nuphar lutea spp. polysepala*** (flower)

Ray Mathews, Lady Bird Johnson Wildflower Center. ***Nymphaea odorata***

Montana Department of Agriculture. ***Butomus umbellatus***, file photo

Jenifer Parsons, State of Washington Department of Ecology. ***Myriophyllum quitense***

Tony Rodd. ***Nitella spp***.

R.W. Smith, Lady Bird Johnson Wildflower Center. ***Potamogeton nodosus*** (fruits), ***Potamogeton nodosus*** (plant form)

PLANT CATEGORIES:
Plant-Like Algae

Plant-like algae lack stems and leaves, although sometimes they have structures that can be mistaken for stems and leaves. Plant-like algae are green with cylindrical, whorled branches. They lack roots, but some species attach to the sediment. Plant-like algae tend to lie on or just above the sediments. They are found from shallow water to very deep areas (20-30 meters) in clear water.

Floating Leaved, Rooted Plants

These plants are rooted in the sediment and have leaves that float on the water surface. They may also have underwater leaves. Often the stems of these plants are not firm enough to keep them upright when removed from the water and at low water they may be found collapsed on the lake bottom. They often form a bed along a lake margin in water 1-3 meters deep.

Submerged Plants

The entire plant is usually underwater, but the flowers and fruits may rise above the water surface. Submerged species are rooted in the sediment and have underwater leaves. They can grow from shallow water to depths greater than 10 meters in very clear water.

Free Floating Plants

Free-floating plants float in the water column, on the surface of the water, or lie on the bottom. This category includes some of the smallest members of the plant kingdom, such as watermeal plants, which look like green specks on the water surface. These plants do not root in the sediment, although some species have roots that dangle in the water. They sometimes form extensive green mats on the water surface.

Shoreline Plants

Shoreline plants grow along edges of lakes, rivers, streams, and ponds or on wet ground away from open water. They have at least part of their stems, leaves, and flowers emerging above the water surface and are rooted in the sediments. Some plants that typically grow in deep water may be found along the shoreline in late summer when water levels are low.