

Aquatic Vegetation

- I. Why care about macrophytes and macroalgae in lakes and ponds?
 - A. Positives
 1. Inhibits shoreline erosion
 2. Nutrient sink
 3. Some plants are aesthetically pleasing
 4. Provide breeding habitat for fish
 5. Provide nursery habitat for larval and juvenile fish
 6. Moderate temperatures
 7. Habitat for macroinvertebrates
 - B. Negatives
 1. Rapid uncontrolled growth; some species form dense stands
 2. Decaying vegetation reduces oxygen
 3. May over-enhance survival of young fish
 4. Some vegetation is undesirable for boaters and anglers
 5. May reduce nutrients available to pelagic food web
- II. Adaptations of macrophytes
 - A. Water supports plants - no need for massive stalks
 - B. Rhizomes or rootstocks - allows for rapid vegetative growth
 - C. Flowers - sexual reproduction; allow dispersal among systems
 - D. Special structures might be necessary for contending with low oxygen (hollow roots) or low nutrients (carnivory; e.g., bladderwort)
- III. Dealing with problem stands of macrophytes
 - A. Avoid problems when building ponds; steep banks and > 1 m depth; avoid runoff
 - B. Fertilization - fertilize to enhance phytoplankton blooms during spring and fall
 - C. Water level - drawdown during winter
 - D. Mechanical control - raking, mowing; often unpractical
 - E. Biological control - grass carp (*Ctenopharyngodon idella*) love to eat aquatic vegetation; will not successfully reproduce without flowing water.
 - F. Chemical control- costly but effective method; requires frequent applications
- IV. Types of macrophytes
 - A. Shoreline - plants grow on water's edge; soil saturated with water
 - B. Emergent - rooted in water but stems and leaves stand out of water
 - C. Floating - plants with floating leaves; rooted in water
 - D. Submerged - plants completely submerged (although some occasionally extend above water)
- V. Shoreline plants
 - A. Water willow (*Justicia americana*)
 1. May provide cover for fish
 2. Important for stabilizing shorelines; may reduce wave erosion
 3. May be resistant to herbivory by carp
 - B. Purple loosestrife (*Lythrum salicaria*)
 1. Invader from northern Europe
 2. Prolific - 300,000 seeds/plant/year
 3. Forms dense stands in wetlands
- VI. Emergent plants
 - A. Spike rushes (*Eleocharis* spp.)
 1. Slender, grows in tufts

- 2. Probably good in ponds
- B. Arrowhead (*Sagittaria* spp.)
 - 1. Three-pointed lobes on leaves
 - 2. Produces starchy tubers; “duck potatoes”
 - 3. Propagates by runners
 - 4. Not a problem in ponds
- C. Bulrushes (*Scirpus* spp.)
 - 1. Produce “spikes” of vegetation
 - 2. Seeds are important food for wildlife
 - 3. Rhizomes allow this group to proliferate
 - 4. Not recommended in ponds
- D. Cattails (*Typha* spp.)
 - 1. Tall, straight, narrow leaves; characteristic sausage-shaped set of flowers
 - 2. Increases sedimentation rates in ponds and lakes
 - 3. Secretes alleopathic chemicals to deter growth of other species; strong competitor
 - 4. Not recommended in ponds
- E. American lotus (*Nelumbo lutea*)
 - 1. Not a water lily; leaves extend above the water
 - 2. Shades out other plants
 - 3. Very aggressive; propagates by rhizomes
 - 4. Not recommended for ponds
- VII. Floating macrophytes
 - A. Water lily (*Nymphyaea odorata*)
 - 1. Leaves rest on the surface (i.e., lily pads)
 - 2. Desirable, slow-growing plant
 - B. Water primrose (*Ludwigia peploides*)
 - 1. Forms dense mats inshore; can extend quite far out
 - 2. Has air-breathing roots; allows occupation of anoxic sediments
 - 3. Aggressive species; not recommended for ponds
 - C. Floating-leaved pondweed (*Potamogeton* spp.)
 - 1. Leaves are different forms above and below the water
 - 2. Can occupy deep water
 - 3. May be a problem in some ponds
 - D. Duckweed and Watermeal (Family Lemnaceae)
 - 1. Widespread in distribution
 - 2. Can become very dense in systems with low wind
 - E. Water hyacinth (*Eichharni crassipea*)
 - 1. Exotic from South America; popular plant among pond culturists
 - 2. Entire plant floats; can clog channels
- VIII. Submerged macrophytes and macroalgae
 - A. Water milfoil (*Myriophyllum heterophyllum*)
 - 1. Cold water species
 - 2. Long, feather-like leaves; rough and stiff
 - 3. Not a problem at this latitude
 - B. Eurasian water milfoil (*Myriophyllum spicatum*)
 - 1. Forms dense mats; not desirable in ponds or lakes
 - 2. From Eurasia and North Africa (1880)
 - C. Coontail (*Ceratophyllum demersum*)
 - 1. Can form dense mats
 - 2. Leaves form distinguishable whorls

- D. Elodea (*Elodea canadensis*)
 - 1. Can form dense mats
 - 2. Looks superficially like coontail
- E. Stonewarts (*Chara* spp.)
 - 1. A macroalgae not a vascular plant
 - 2. Distinguished by oogonia on stalks