



Aquatic Invasive Species Quick Guide

Water Chestnut (*Trapa natans* L.)

Description: Water chestnut is a non-native, annual aquatic plant in the Trapaceae family. It produces a floating rosette of very waxy, triangular leaves which are heavily serrated on the edges. The leaf stalk is swollen at the base to provide buoyancy. Submersed leaves are opposite and highly divided into delicate leaflets. Roots can form at any of the submersed nodes, and the plant may be found rooted to the bottom in shallow water. Flowers are 4-parted and occur at the base of the floating leaves. Fruits are hard, about one inch across, with four stiff spines. Water chestnut prefers slow, nutrient-rich waters.



Water chestnut forms large, floating rosettes with dozens of triangular leaves.

North American Distribution: Along the east coast, from Virginia to Quebec.



Submersed leaves are opposite and highly divided into many thin leaflets.

Dispersal Vectors: Native to Europe and Asia, it was introduced intentionally to several water bodies in Massachusetts. Fragments of water chestnut can be transported by boat trailers and equipment, and rosettes can float to new areas (especially in riverine systems). Water chestnut has been used in water gardens, and may escape through improper disposal of unwanted plants. Seeds remain viable for 12 years, and are probably too heavy to cling to animal fur or feathers.

Ecological Impacts: Water chestnut can rapidly cover entire bays of lakes and rivers, shading out native plants underneath, and reducing dissolved oxygen levels. The reduction in plant diversity and dissolved oxygen has serious consequences to the aquatic animal community. Large, barbed fruits are extremely sharp and can puncture feet and even shoe soles.

Control Options: Manual removal of water chestnut is highly effective. Plants are easily seen, and floating rosettes can be easily removed from the water. Care must be taken to remove all fragments of the plant, and rooted portions must be carefully removed to avoid breakage. Seeds may also fall off easily if removal is done late in the growing season. Mechanical harvesting has been effective at clearing large areas of water chestnut, but fragmentation is likely to spread water chestnut. Rooted plants will re-sprout if only the top portion is removed.

Chemical control can be successful at reducing water chestnut, and typically utilize 2,4-D or triclopyr herbicides. Several years of treatments are necessary to kill seedlings as they re-populate the area. Most states require chemical use permits for any herbicide treatments in standing water or wetland situations.

Several possible biological control agents have been studied, but none has been considered a feasible strategy for large-scale control.

Note: The water chestnut common in Asian cooking is *Eleocharis dulcis*, not *Trapa natans*.

Additional Information:

Naylor, Mike. 2003. Water chestnut (*Trapa natans*) in the Chesapeake Bay watershed: a regional management plan. Maryland Department of Natural Resources. <http://www.dnr.state.md.us/irc/docs/00016247.pdf>

Poovey, A.G. and Kurt D. Getsinger. 2007. Subsurface applications of triclopyr and 2,4-D amine for control of water chestnut (*Trapa natans* L.). *J. Aquat. Plant Manage.* 45: 63-66. <http://www.apms.org/japm/vol45/v45p63.pdf>

Photo Credit: Paul Skawinski



The stalks of floating leaves are swollen with large air cells.