Ceratophyllum demersum L.

Coontail

Family: Ceratophyllaceae
Range: Throughout the United States, including all western states.
Habitat: Ponds, slow-flowing streams, and ditches in temperate to tropical regions. Coontail tolerates low light levels and some turbidity, but not salinity. It grows best in high-nutrient water, in 8 to 16 ft of water.
Origin: Coontail is considered a native in many areas of the world, including the western United States. Plants are sometimes sold as an aquarium or pond ornamental.
Impacts: In natural areas, plants provide food and shelter for wildlife and are a desirable component of aquatic habitats. However, plants may develop dense sub-surface mats in high nutrient waters, channels, and controlled aquatic systems. Mats can inhibit water flow, block intake screens of water pumps, interfere with recreational activities, and create mosquito habitat.

Submersed annual to perennial with somewhat firm, forked bottlebrush-like leaves and stems to ~8 ft long. Plants lack roots and exist free-floating or anchored to the substrate by specialized, finely divided buried stems (rhizoid shoots). Young seedlings detach from the soil substrate when stems are about 4 inches long, and must absorb nutrients directly from the water. The stems are slender, branched, with only one branch per node. The stems usually fragment easily. The leaves are sessile, 5 to 12 whorled at each node, mostly forked 2-3 times, with margins that are conspicuously small-toothed. Turions (overwintering buds) consist of dense clusters of scale-like leaves at the stem tips.

Male and female flowers develop on the same plant (monoecious). The flowers are submerged, small, solitary and relatively inconspicuous in the leaf axils. Flowers are water-pollinated. Anthers detach and float just below the water surface before releasing pollen, which sinks down to the female flowers below. Pollination is most likely to occur in still water. Fruits are achene- or nut-like, and do not open to release the single seed. Coontail reproduces vegetatively by turions and stem fragments and also by seed. Fruits and turions sink to the bottom when separated from the parent plant. Fruits and vegetative parts disperse to greater distances with water or by clinging to the fur, feathers, or feet of animals.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, suction dredge, bottom barriers)	Removing and destroying stem fragments from recreational equipment, such as boat propellers, docking lines, and fishing gear can help prevent the spread of coontail. Mechanical harvesting has proved sufficient to control coontail stands in some temperate areas. Several types of "bottom barriers" are available and are used to cover and smother specific infested areas. Materials used include polyvinyl chloride (PVC) sheets, small-mesh screens and natural fibers such as jute. Bottom barriers are best installed in spring before plants produced large biomass and exceed 20 inches tall.
Cultural	Dewatering during hot summer or exposure to hard freeze will reduce subsequent growth from fragments. However, seed can withstand severe conditions and may provide sources for reinfestation. Reducing nutrients in the water column can suppress growth since coontail has no true roots to obtain nutrients directly from the sediment.
Biological	The triploid (sterile) grass carp (white amur) is a relatively nonselective herbivorous fish that will consume coontail as one of their preferred plant diets. Permits are usually required in all U.S.

	states for use of grass carp.

CHEMICAL CONTROL

The following specific use information is based on reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

GENERAL CELL TOXICANT	
Acrolein *Magnacide H*	**Rate:** For in-water treatment: 1 to 15 ppm (variable, depending on target weeds, temperature and flow rates) **Timing:** Apply directly to water in late spring to fall. No more than 8 applications are allowed per year. **Remarks:** Acrolein is a very fast-acting, nonselective contact herbicide and algaecide. It is a "Restricted Use" pesticide but can be used in some irrigation canals under specific conditions, with proper permits, and may only be applied by qualified, trained applicators. Symptoms of efficacy may appear in less than an hour and include discoloration of leaves and loss of turgidity in plant shoots.
Endothall *Cascade*; *Aquathol*	**Rate:** 0.2 to 5.0 ppm (in-water application; e.g. flowing water in irrigation canals). Exposures must be maintained for 6 to 120 hours. Duration of contact depends on the concentration achieved. **Timing:** Apply directly to water in early spring to early summer. Endothall can be used in mid-summer, but to prevent reduction in dissolved oxygen, only partial treatments are recommended if biomass is large. **Remarks:** Endothall is a selective, contact herbicide. It affects young, rapidly growing plants and mature plants. Lower rates can be used if applied during early spring growth and when water movement is not likely to dilute or move the herbicide.
CONTACT PHOTOSYNTHETIC INHIBITOR	
Flumioxazin *Clipper*	**Rate:** For in-water treatment: 100 to 400 ppb **Timing:** Apply directly to water from early spring to early summer, during the plants rapid growth phase. **Remarks:** Flumioxazin is rapidly degraded and is inactive if pH exceeds 8.5. Thus, it is important to only use if pH will not exceed 8.5. It is best to apply flumioxazin in the early morning when the pH is low.
PIGMENT SYNTHESIS INHIBITORS	
Fluridone *Sonar*	**Rate:** 10 to 90 ppb (in-water application). Exposures must be maintained for 5 to 7 weeks for optimal control. **Timing:** Apply directly to water from early spring to early summer. **Remarks:** Fluridone is a slow-acting systemic herbicide. It affects young, rapidly growing plants. Lower rates can be used if applied during early spring growth and when water movement is not likely to dilute or move the herbicide.
INORGANIC HERBICIDES	
Chelated copper *Komeen*, *Cutrine-plus*, *Nautique*	**Rate:** 0.5 to 1 ppm elemental copper (Cu) **Timing:** Apply directly to water in spring to late summer. **Remarks:** Chelated copper is a fast-acting contact herbicide. Retreatment may be required within 3 to 5 weeks. If biomass is large, treat only one-third of infested area to minimize decrease in dissolved oxygen. Chelated copper products are less affected by high pH and "hard water" than inorganic copper products (See "Inorganic copper" below).
Inorganic copper Various granular and liquid products	**Rate:** 0.5 to 1 ppm elemental copper **Timing:** Apply directly to water in early summer when plants are short and biomass is small. **Remarks:** Copper is a fast-acting contact herbicide. Retreatment may be required within 3 to 5 weeks. If biomass is large, treat only one-third of infested area to minimize decrease in dissolved oxygen. Most inorganic copper formulations have poor efficacy in "hard water" (e.g. > 125 ppb calcium carbonate equivalent) and high pH (> 8).
NON-HERBICIDAL CHEMICALS	
Dyes or colorants *Aquashade*	Although technically not herbicides, dyes and colorants control submerged aquatic plants by absorbing light in the water column and reducing photosynthesis. Applications should be made in early spring and repeated to maintain concentration recommended on the label. Colorants are not as effective on well-established plants in mid- to late summer.

RECOMMENDED CITATION: DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.