



Fanwort

Cabomba caroliniana A. Gray, 1837
syn. *Cabomba aquatica*, *C. australis*, *C. pulchurrima*

ALBERTA REGULATION:
FISHERIES ACT

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Overview:

Fanwort is a submerged or free-floating freshwater aquatic perennial plant native to the Southeastern U.S. and parts of South America.³ It is a member of the water-shield family.¹ Fanwort is a very popular and mass-cultivated aquarium plant, sold around the world.² The first Canadian discovery was in 1991 at Kasshabog Lake, Ontario.³

C. caroliniana roots in the mud of slow flowing water where the stems can reach the surface. The short rhizomes have fibrous roots.² Fanwort has emergent (above water) flowers and can reproduce by seed; however, seed produced by populations in the Northern parts of its range rarely germinate.³ Reproduction is primarily vegetatively via rhizomes or stem fragments. Parts of the plant can survive free-floating for 6 to 8 weeks.² In late fall the lower stems become

brittle and break up.³ Stem fragments with only two leaves³ can generate new plants and if buried in sediment, can overwinter under ice and re-grow in the spring.¹

Three phenotypes of fanwort have been documented by foliage colour. One purple, one green and one intermediate. The purple type has been associated with warmer water and higher light, and the green type with cooler water and lower light.³

Fanwort can be confused with native *Ceratophyllum* and *Megalodonta* species as well as native and introduced watermilfoil species.¹

As of January 1, 2016, the possession, sale, or transport of this species in Alberta is illegal under the Fisheries Act.

Impacts:

Fanwort grows quickly and is extremely competitive², crowding out native aquatic vegetation.³ Fanwort mats reduce the amount of sunlight penetrating the water column.³ Dense mats of fanwort can interfere with the hydrological regime by overflowing banks and impeding drainage.² Winter die-back releases substantial amounts of nutrients, especially manganese, interfering with water quality.¹

Fanwort discolours water and gives it an unpleasant taste, increasing costs for municipal water treatment.³ Dense infestations of fanwort interfere with swimming, boating and angling, which can impact tourism. Some fishing camps in the U.S. have had severe economic impacts due to heavy fanwort infestations.¹ Infestations also reduce the aesthetic quality of shoreline property.³



Fanwort *(continued)*

Habitat:

Fanwort roots in still or slow-moving waters or ponds, sloughs, ditches, and reservoirs. It grows most often in waters 0.4-1.2 m deep and up to 6 m. It can tolerate pH from 5.7-9.2, anaerobic conditions, and waters with high turbidity.¹ It prefers warm waters but can survive winter under ice.¹ It does best in high nutrient waters. Fanwort tends to lose its leaves in high alkalinities and high calcium levels inhibit growth. It can tolerate fluctuating water levels.²

Identification:

Stems are upturned extensions of horizontal rhizomes and green to olive-green, sometimes reddish brown.¹ Stems are branched, can grow up to 10m long, and are scattered with white or reddish-brown hairs.²

Leaves Underwater leaves are finely divided and have a feathery, fan-like appearance.² They are opposite, measure 1-3.5 by 1.5-5.5 cm, and borne on petioles up to 4 cm long.¹ Whereas, the floating leaves are small, diamond-shaped² blades 0.6-3 cm by 1-4 mm. The margins are either notched or entire at the base.¹

Flowers are solitary and emerge on stalks with white to purplish¹ or pale yellow petals that surround a yellow center, around 6-15 mm in diameter, in May to September.² Petals are obtuse or notched. Stamens 3-6, 2-4 pistils and 3 ovules.¹

Fruits are 4-7 mm containing 1-3 seeds which are 1.5-3 by 1-1.5 mm with tubercles in 4 rows.¹

Prevention:

Fanwort is spread primarily by human activities - ornamental use, aquarium dumping, or via recreational water equipment. Waterfowl or wildlife may also transport plant fragments.¹ Learn to recognize fanwort and do not purchase or grow it. Never empty any contents of an aquarium into natural water bodies. Bag and dispose of unwanted aquatic plants in landfill-bound garbage. Early detection provides the best chance of control.

Boat engine propellers can facilitate spread within a water body by fragmenting stems, or to another water body by plant matter stuck to boats and trailers. All aquatic equipment should be inspected and cleaned after each use.³ Upon leaving a water body check all equipment, clothing, and pets for plant material and leave it at the site. Any material discovered after leaving the site should be disposed of in garbage.

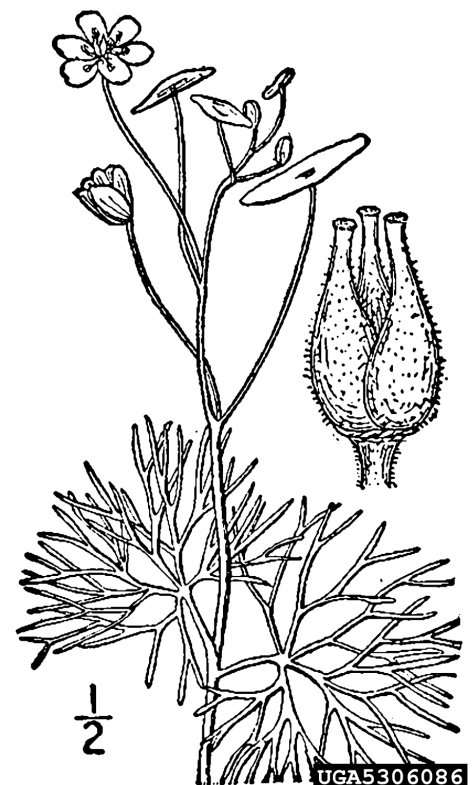
Control:

Mechanical - Manual removal creates stem fragments, which facilitates spread, and therefore provides only short-term relief.³ Fanwort is very sensitive to desiccation so drawdown of water bodies to dry down plant material where possible is an effective physical control method.³ Benthic barriers may prevent downstream spread.³

Chemical – Currently there are no products registered for control of *C. caroliniana* in Canada. Pesticide use in water bodies requires special certification and permits. Always

check product labels to ensure the herbicide is registered for use on the target plant in Canada by the Pesticide Management Regulatory Agency.

Biological – A search of fanwort's native range identified a stem-boring weevil and an aquatic moth as possible candidates.³



USDA PLANTS Database, USDA NRCS PLANTS Database, Bugwood.org



Fanwort (continued)



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1. Datasheet report for *Cabomba caroliniana* (Carolina fanwort). Invasive Species Compendium. www.cabi.org/isc/datasheetreport?dsid=107743 Accessed: December 16, 2016.
2. Global Invasive Species Database (GISD) 2015. Species profile *Cabomba caroliniana*. Available from: <http://www.iucngisd.org/gisd/species.php?sc=402> Accessed: December 16, 2016.
3. Hackett, R.A., Caron, J.J., and Monfils, A.K. (2014). Status and Strategy for Carolina Fanwort (*Cabomba caroliniana* A. Gray) Management. Michigan department of Environmental Quality, Lansing, Michigan.