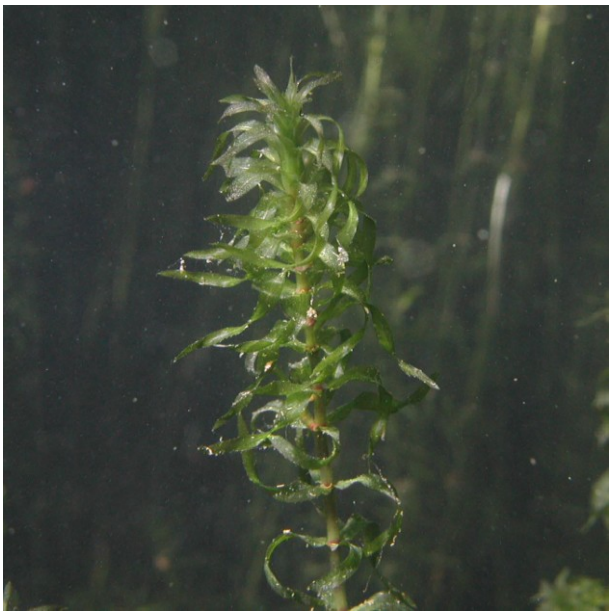
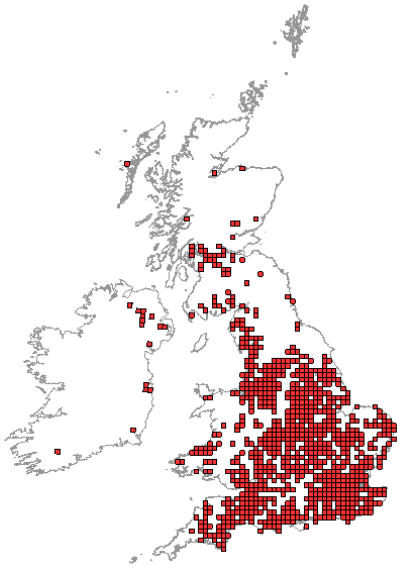
Newman, J.R. and Duenas, M.A. (2010)

Information Sheet 25: *Elodea nuttallii*, Nuttall's pondweed





Elodea nuttallii grows in still or slow flowing eutrophic waters. It has replaced *E. canadensis* at many sites due to increased eutrophication and is being replaced by *Lagarosiphon major* in turn. It was first found in Europe in 1939 and in Britain in 1966. It has spread to over 4000 sites since then. It is often found in species poor macrophyte communities subject to boat traffic, management and in eutrophic drainage ditches. It is tolerant of disturbance, oil pollution and salinity up to 14 parts per thousand (approximately half seawater). All *Elodea* species tend to act as metal ion pumps, taking up metals from the sediment and releasing them to the water. *E. nuttallii* is very tolerant of Copper in particular. It is most common in calcareous waters and eutrophic waters because it has a high tissue demand for both phosphorus and nitrogen. It over-winters as prostrate shoots which start to regenerate new lateral shoots as the temperature reaches 6-8^{o}C. The shoots grow rapidly towards the surface without branching where they form a densely branched canopy.

Both *Elodea* species have whorls of three leaves around the stem. Subsequent internodes are rotated at 60^{o} giving the appearance of being arranged in 6 rows. *E. nuttallii* is distinguished from *E. canadensis* by the possession of leaves which are in most cases narrower than 1.75mm (mean 1.4 mm, range 0.4 to 2.4 mm); usually no longer than 10 mm (mean 7.7 mm, range 4 to 15.5 mm); leaves which are folded along the midrib, somewhat recurved with undulate margins (visible with hand-lens). The leaves are pale green and flaccid and linear to lanceolate in shape (pointed tips). *E. canadensis* has leaves which are usually wider than 1.75 mm (mean 2.0 mm, range 1.1 to 5 mm); mean leaf length is 8.1 mm (range 5 to 13 mm). The leaves are flat and are widely acute to obtuse or obtuse-acuminate at the tip (this means it has approximately blunt or rounded leaf tips). *E. canadensis* also develops axillary or apical stem turions, which are absent in *E. nuttallii.*

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Mechanical control

Mechanical control is best practised before July. This is because during June the roots of this species die and in September the plant attains maximum biomass. It is therefore desirable to cut after the time when regrowth will be slow and, only from stem fragments left after the treatment. Cutting before the end of June will require a second cut later in the season. However, cutting very early in the season from mid February onwards, using trailing knives, or chains, will limit the early season growth and give approximately 8-10 weeks control. If regular treatments are made in this way during the summer at 6-8 week intervals, then maximum biomass should not be reached. This also limits the amount of floating material produced late in the season.

To limit the amount of biomass required to be harvested it is also necessary to cut before September. Cutting later than September will limit the effectiveness because biomass will be reduced by washout and the plant will have adopted the prostrate form characteristic of over wintering plants.

Chemical control

There are no methods for chemical control of Elodea species in Europe. Outside Europe, some herbicides are approved, and readers should consult their local government Environment Agency or equivalent.

Biological control

The use of herbivorous Chinese Grass Carp is appropriate as a control method for this plant. Common Carp, and other bottom feeding fish, which create turbid water, can also be effective in preventing regrowth of the plant after mechanical removal or control by a herbicide.

Environmental control

Shade will control most submerged aquatic plants. This can be achieved by planting trees on the south side of water bodies or by using a floating sheet of opaque material. Care must be taken when using the latter to prevent sudden deoxygenation.

The use of dyes has been successful in static waters. Early application of the dye is critical to the success of this technique, preferably before the plant has started to grow in spring, or when water temperatures are still less than 8 to 10ºC. A further application may be required after 6 – 8 weeks, depending on dilution from rainfall, or degradation by UV light. Blue dyes are generally cheaper than other colours, but all colours will reduce or completely control *E. nuttallii*.

Best options

Remove as much of the plant as possible by mechanical means after the end of June and before the end of August;

If you prefer a biological control option then use Grass Carp. Be sure to obtain all the necessary agreements from Defra, the Environment Agency and Natural England.

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