



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 650 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°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° 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). The leaves are dark green and crisp. *E. canadensis* also develops axillary or apical stem turions.

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 overwintering plants.

Chemical control

E. nuttallii is susceptible to terbutryn and dichlobenil applied in spring before the plant is fully grown. Terbutryn will kill all submerged vegetation and can only be used in still water. Dichlobenil affects most rooted submerged plants and some rushes too.

Chemical control should give effective eradication of the plant for between 2 and 3 years. Regular inspections should be made to check on re-infestation and spot treatments should be applied to prevent further spread. It is difficult to control in gravel pits with dichlobenil because of the porous nature of the substrate.

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.

Best options

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

For early season control use dichlobenil or terbutryn before the end of April.

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