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STOP!

**The spread of
invasive species and
harmful pathogens**



Nuttall's Pondweed
Elodea nuttallii



Iascach Intíre Éireann
Inland Fisheries Ireland



caisie



NATURA 2000

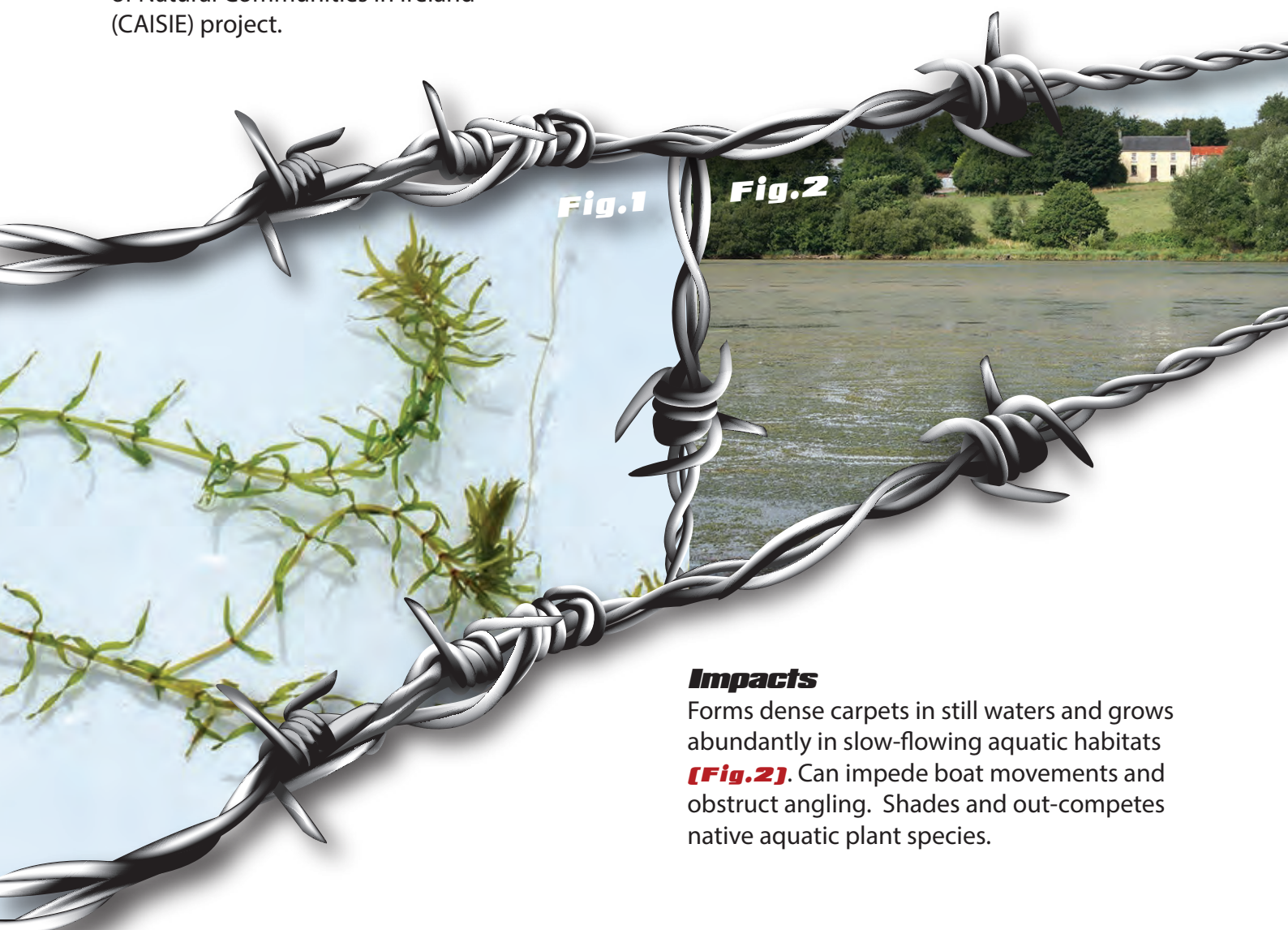


Scope

This best practice document provides guidance to stakeholders on effective measures to control the highly invasive aquatic plant Nuttall's pondweed *Elodea nuttallii* based on methods used and developed by Inland Fisheries Ireland (IFI) under the EU LIFE+ funded Control of Aquatic Invasive Species and Restoration of Natural Communities in Ireland (CAISIE) project.

Identification

Leaves grow in whorls of 3 or 4 and are recurved. They are widest at their base and taper to a point (**Fig.1**). Species is similar in appearance to Canadian pondweed and Curly-leaved waterweed. An identification sheet and video can be found here: <http://www.fisheriesireland.ie/Invasive-species-list/nuttalls-pondweed.html>



Impacts

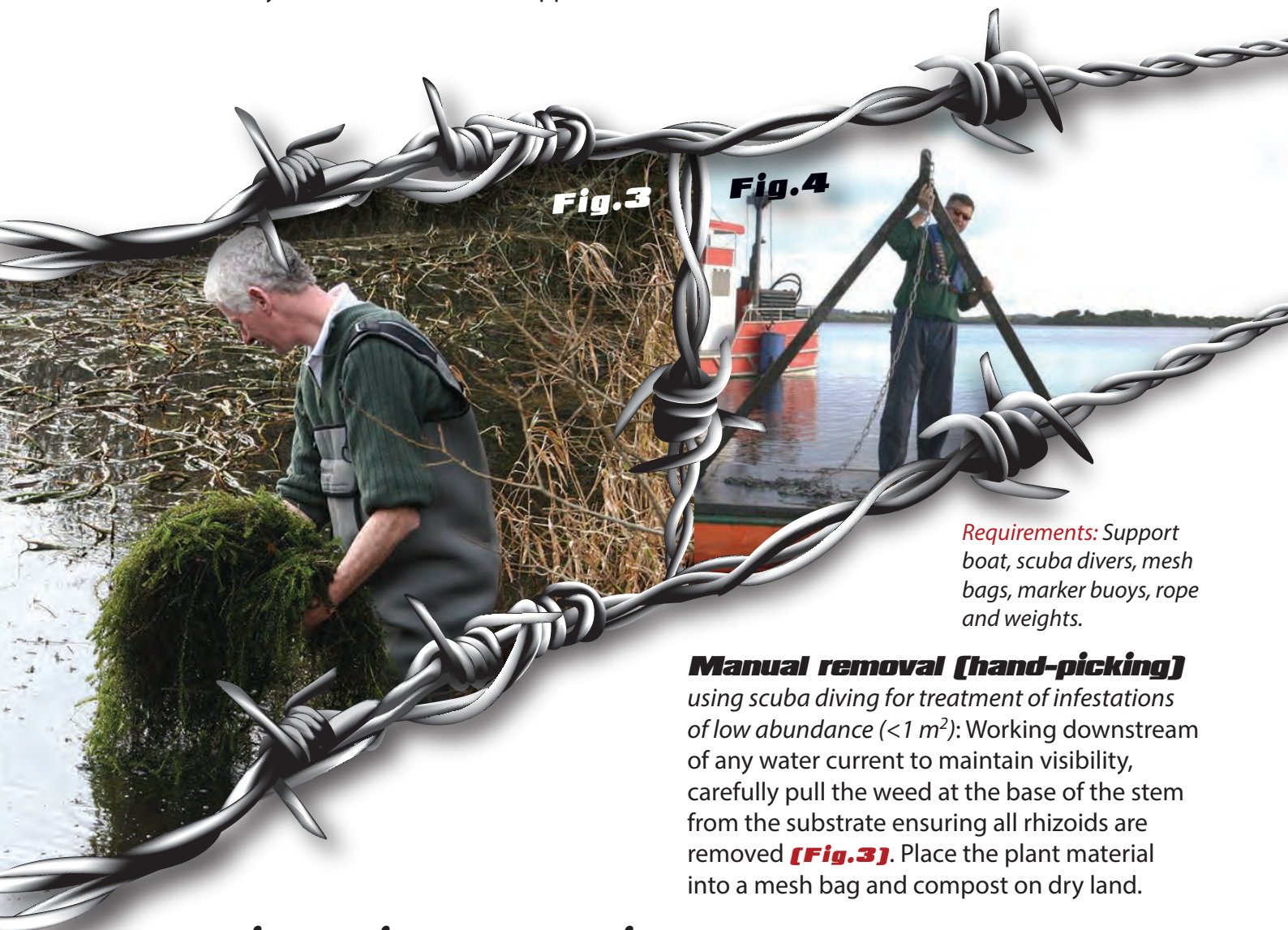
Forms dense carpets in still waters and grows abundantly in slow-flowing aquatic habitats (**Fig.2**). Can impede boat movements and obstruct angling. Shades and out-competes native aquatic plant species.

Pre-control assessment

Determine the detailed distribution and abundance of the weed in the target area: As this weed can grow to 4 metres depth, direct observations from the bankside or a boat should be undertaken, supplemented by a benthic viewer, snorkelling or scuba diving as required. Mark the location of all weed stands encountered on a map or using a GPS and record the size of each stand present. For infestations present over a large area (>1000 m²), use parallel transects to survey, with transects delineated by marker buoys or pre-determined GPS waypoint routes. The distance between each transect should be determined with consideration to water visibility and the survey time available. Any native aquatic vegetation encountered should also be recorded. Data should be entered into a GIS mapping system, if possible.

Effective control measures

The following effective control methods have been developed and successfully deployed by IFI under the EU LIFE+ CAISIE project to target Nuttall's pondweed. Mechanical cutting and harvesting can achieve a high level of control, with repeat treatments required to increase long-term efficacy. Trials conducted with light-excluding jute matting during the project found that it was less effective when applied as a single layer in shallow water (< 1 m); therefore, a modification is presented. The weed stands targeted for control should be demarcated with surface marker buoys. The area of infestation may determine the control approach used.



Requirements: Support boat, scuba divers, mesh bags, marker buoys, rope and weights.

Manual removal (hand-picking)

using scuba diving for treatment of infestations of low abundance (<1 m²): Working downstream of any water current to maintain visibility, carefully pull the weed at the base of the stem from the substrate ensuring all rhizoids are removed **(Fig.3)**. Place the plant material into a mesh bag and compost on dry land.

Mechanical cutting and harvesting using trailing V-blades for treatment of dense, erect, canopy-forming weed stands (>1000 m²) in soft bottom sediments: A containment net is set around the area to be treated. The operator manoeuvres the mechanical cutting boat over buoyed-out sections of the infested area. The trailing V-blades rip through the sediment allowing the cut vegetation to float to the surface **(Fig.4)**. This weed is then removed by a harvesting boat, which submerges the front-loading forks just below the water surface to collect it **(Fig.5)**. The weed is taken to a support boat if necessary and brought for subsequent composting on dry land. In very dense weed stands, the canopy may be first thinned out by the front-loading forks before V-blade cutting commences. The containment net should be serviced regularly to remove any floating weed fragments.

Requirements: Mechanical cutting boat with trailing V-blades (2.5 m long) attached by up to 8 m long chains, harvesting boat with front-loading forks, support boat, containment net and suitable composting area.

Light-excluding jute matting for treatment of weed stands > 1 to c. 1000 m² or for stands in shallow water (< 1 m depth): For shallow systems a double layer of jute matting is recommended. Pre-cut jute matting sheets are fed out from the shore or a boat, as appropriate (**Fig.6**). For water depth >1 m this will require scuba divers. A purpose-modified boat with a rear-mounted dispensing reel may be used to deploy sheets > 30 m length. Weights are attached at the corners of the sheet and at 3 m intervals using tying wire. (1 kg weights can be made up from jute sacks containing washed pea gravel tied off with tying wire.) The sheet is then stretched out and laid flush to the bottom over the infested area (**Fig.7**). The matting should be water-saturated before deployment to enable it to sink more effectively. Adjacent sheets can be stitched together *in situ* using tying wire. This control method can have the additional benefit of facilitating the regeneration of native vegetation from seed reserves. For more refer to *Caffrey *et al.* 2010.



Requirements: Purpose-modified boat with rear-mounted dispensing reel (for large jute sheets,) support boat, scuba divers, pre-cut jute matting sheets, marker buoys, rope and weights, 2.5 mm gauge tying wire, washed pea gravel. Jute matting is sourced from an Irish distributor in rolls 900 m long x 5.16 m wide sheets (weave density 4 mm²; weight 187 g/m²).

Post-control monitoring In order to properly evaluate the efficacy of the control measures implemented and to monitor the natural recovery of the native habitat, post-control assessment is necessary. Such monitoring should be conducted immediately after the control operations are concluded to assess the need for further control and, additionally, on at least an annual basis. Re-survey the treated area in the same manner used during the pre-control assessment and compare the results. Consider appropriate remediation measures to enhance habitat recovery, if required, in consultation with appropriate experts and agencies. This may include the re-planting, re-location or transplantation of extirpated native species. Consider further control treatment if necessary.

Additional considerations

An appropriate risk assessment, which includes Health & Safety considerations, should be carried out before any control or survey work is undertaken. Permission or licences from the appropriate authorities may be required to carry out invasive species control work in some locations, such as Natural Heritage Areas, Special Areas of Conservation, Special Protection Areas and waterways. The requirements listed under each control method are not prescriptive and only provide information on the principal items required.



Fig.7

Further information

Dr. Joe Caffrey, Inland Fisheries Ireland
Tel +353 1 8842600
www.fisheriesireland.ie/invasivespecies
www.caisie.ie

*Caffrey, J.M., Millane, M., Evers, S., Moran, H. and Butler, M. (2010). A novel approach to aquatic weed control and habitat restoration using biodegradable jute matting. *Aquatic Invasions* 5(2): 123-129.

http://www.aquaticinvasions.net/2010/AI_2010_5_2_Caffrey_etal.pdf
<http://www.fisheriesireland.ie/Invasive-species-list/nuttalls-pondweed.html>

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The CAISIE Project is an EU Life+ funded programme co-financed by the National Parks and Wildlife Service.

The primary purpose of the project is to control and possibly eradicate aquatic invasive species in Lough Corrib and the Grand Canal and Barrow Navigation, the development and dissemination of effective control methods and raising the awareness of such species through stakeholder engagement.

Please report aquatic invasive species sightings to info@caisie.ie or Lo-Call 1890 34 74 24





Be biosecurity aware!

<http://www.fisheriesireland.ie/invasive-species/invasive-species.html>

For information and to report
LO-CALL: 1890 34 74 24

The CAISIE project is coordinated by Inland Fisheries Ireland and funded with the contribution of the LIFE financial instrument of the European Community, with co-financing from the National Parks and Wildlife Service.