

Inspect

Remove

Clean

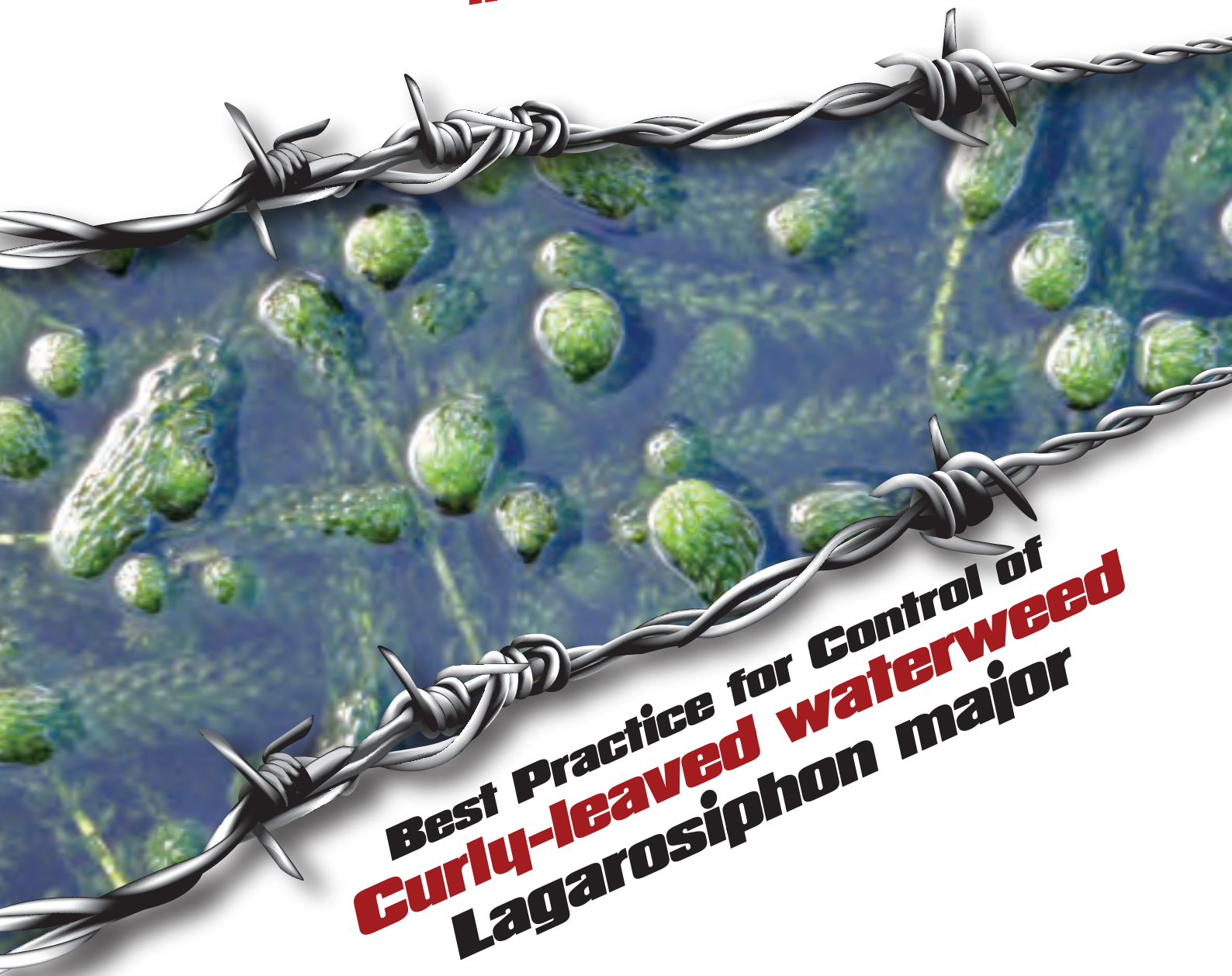
Dispose

Notify



STOP!

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



**Best Practice for Control of
Curly-leaved waterweed
Lagarosiphon major**



Iascach Intíre Éireann
Inland Fisheries Ireland



caisie



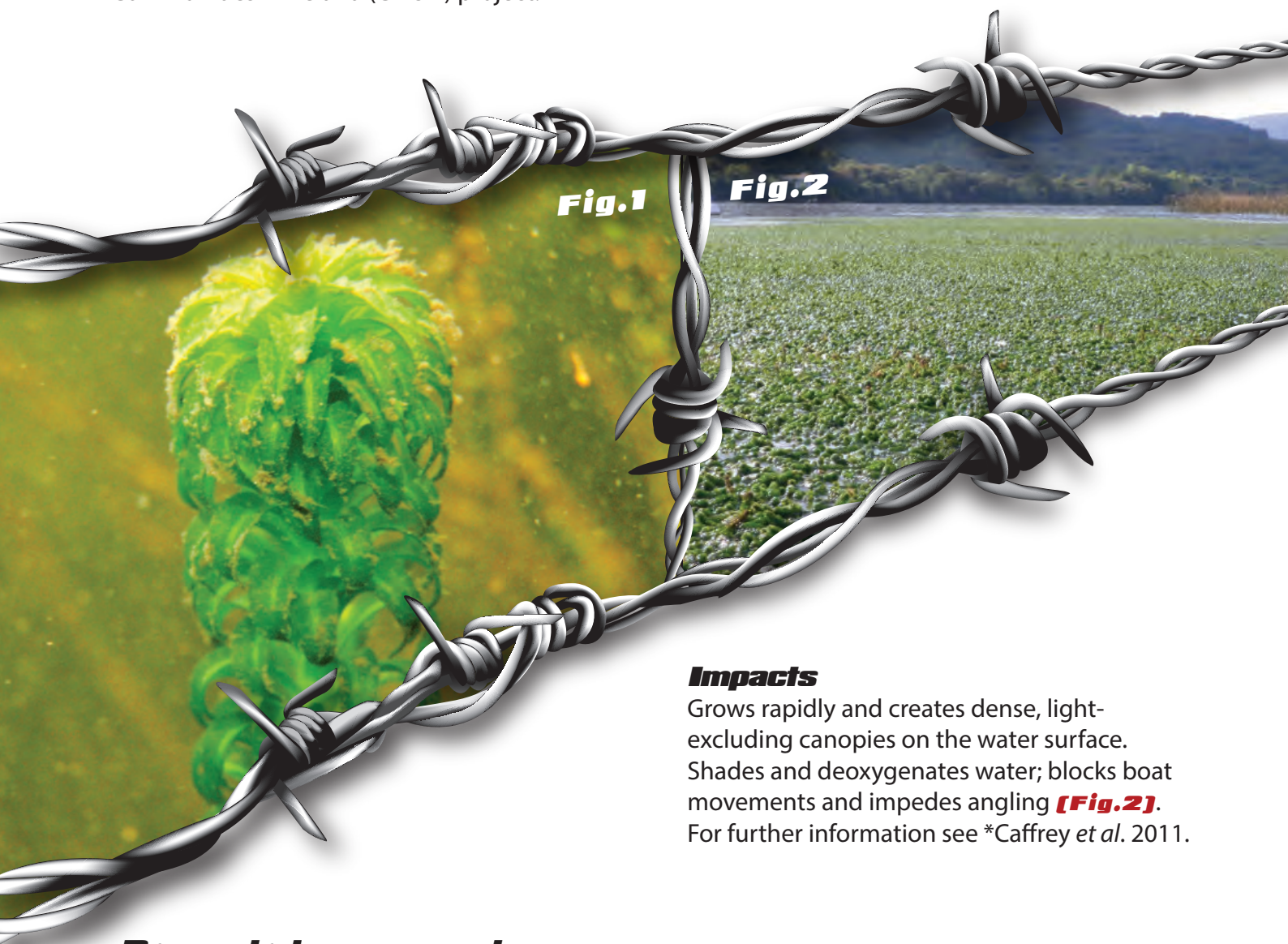


Scope

This best practice document provides guidance to stakeholders on effective measures to control the highly invasive aquatic plant Curly-leaved waterweed *Lagarosiphon major* 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

Submerged canopy-forming weed occurring in lakes, ponds and slow-flowing watercourses. Recurved leaves are arranged spirally along the stem, which is hollow and fragile **(Fig.1)**. An identification sheet and video can be found here: <http://www.fisheriesireland.ie/Invasive-species-list/curly-leaved-waterweed.html>



Impacts

Grows rapidly and creates dense, light-excluding canopies on the water surface. Shades and deoxygenates water; blocks boat movements and impedes angling **(Fig.2)**. For further information see *Caffrey *et al.* 2011.

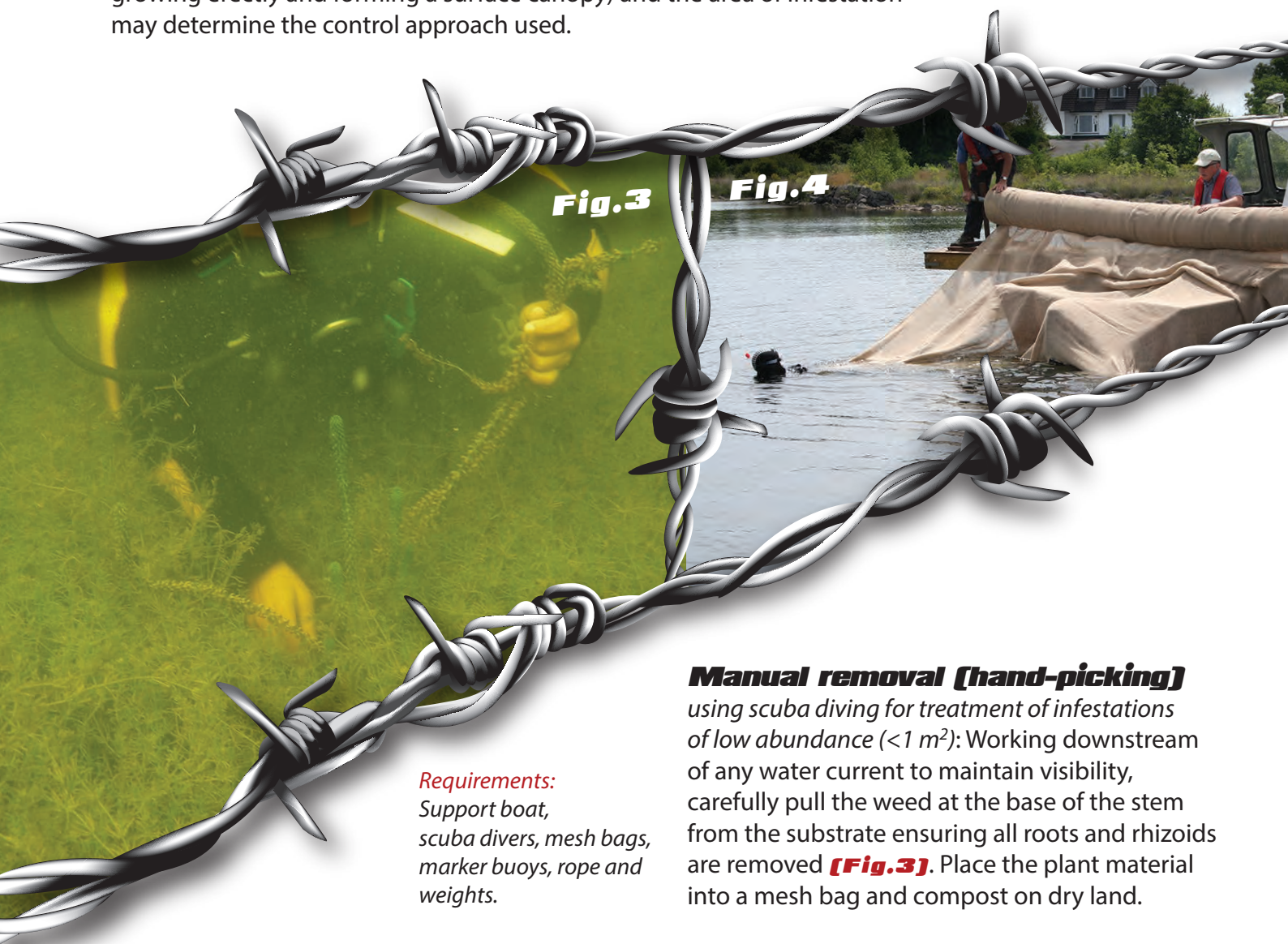
Pre-control assessment

Establish the distribution and abundance of the weed in the target area: As this weed can grow to 6 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 time available. Any native 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 Curly-leaved waterweed. Other less effective control methods (e.g. light-exclusion using plastic sheeting) have previously been trialled by IFI, with only limited success. Two of the methods (manual removal and light-excluding jute matting) can effect local or system-wide eradication after a single treatment. Mechanical cutting and harvesting can achieve a high level of control, with a repeat treatment increasing long-term efficacy. The weed stands targeted for control should be demarcated with surface marker buoys. The form of the weed present (i.e. the plant mass is collapsed on the water bottom or it is growing erectly and forming a surface canopy) and 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 ($<1 \text{ m}^2$): Working downstream of any water current to maintain visibility, carefully pull the weed at the base of the stem from the substrate ensuring all roots and rhizoids are removed **[Fig.3]**. Place the plant material into a mesh bag and compost on dry land.

Light-excluding jute matting for treatment of collapsed weed stands $> 1 \text{ m}^2$ to c. 1000 m^2 (April to October) or for stands in shallow water ($< 1 \text{ m}$ depth): Pre-cut biodegradable jute matting sheets are fed out from the shore or a boat as appropriate **[Fig.4]**. For water depth $> 1 \text{ m}$ this will require scuba divers. A purpose-modified boat with a rear-mounted dispensing reel may be used to deploy sheets $> 30 \text{ m}$ 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.5]**. The matting should be water-saturated before deployment to enable it to sink more effectively. Adjacent sheets can be stitched together using tying wire. In shallow depths (< 1 m), a double layer of jute matting is recommended. The use of jute matting for Curly-leaved waterweed control has the additional demonstrated benefit of facilitating the regeneration of native charophyte and other vegetation that can germinate from seed reserves and re-establish in the absence of the invasive weed. 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 in rolls 900 m long x 5.16 m wide sheets (maximum weave density 4 mm²; weight 187 g/m²).

Mechanical cutting and harvesting using trailing V-blades for treatment of dense, erect, canopy-forming weed stands (>1000 m²) in soft bottom sediments (October to April): A containment net should be set around the area to be treated. The operator should manoeuvre the mechanical cutting boat over buoyed out sections of the infested area. The trailing V-blades and chains rip through the sediment allowing the cut vegetation to float to the surface **[Fig.6]**. This weed can then be removed by a harvesting boat by submerging the front-loading forks just below the water surface to collect it **[Fig.7]**. The weed can be taken to a support boat 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-blading 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 chains up to 8 m long, harvesting boat with front-loading forks, support boat, containment net and composting area

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 area targeted 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.



Fig.7

Further information

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www.fisheriesireland.ie/invasivespecies
www.caisie.ie

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.

*Caffrey, J.M., Millane, M., Evers, S., Moran (2011). H. Management of Lagarosiphon major (Ridley) moss in Lough Corrib - A Review. Biology and Environment 111B: 1-8. <http://tinyurl.com/anw6fm7>

**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_et_al.pdf
<http://www.fisheriesireland.ie/Invasive-species-list/curly-leaved-waterweed.html>



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.